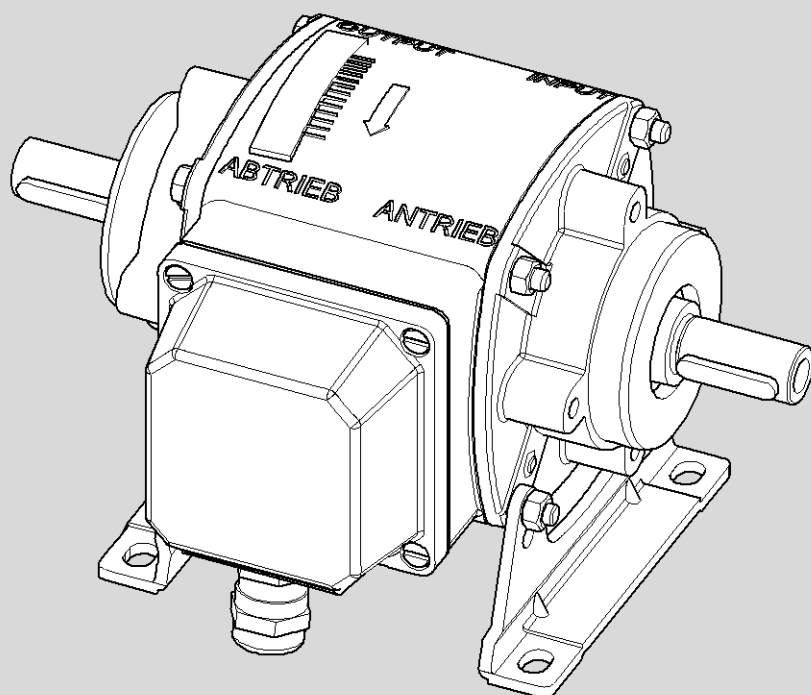


# Operating Instructions Electromagnetic clutch-brake combinations

14.800/14.810



## INTORQ

setting the standard

[www.intorq.de](http://www.intorq.de)

## This documentation is valid for:

14.800.06	14.810.06
14.800.08	14.810.08
14.800.10	14.810.10
14.800.12	14.810.12
14.800.16	14.810.16

## Nameplates

Field	Contents	Example
1	Manufacturer	<b>INTORQ</b> D - Aerzen Typ: 14.800.16.11.1 24V DC      38/50W      120/120NM 00860918 Nr.: 00114274      22.11.06
2	Brake type	
3	Rated voltage      Coil power brake/clutch      Rated torque brake/clutch	
4	Customer No.	
5	Type No.      Date of manufacture	

## Document history

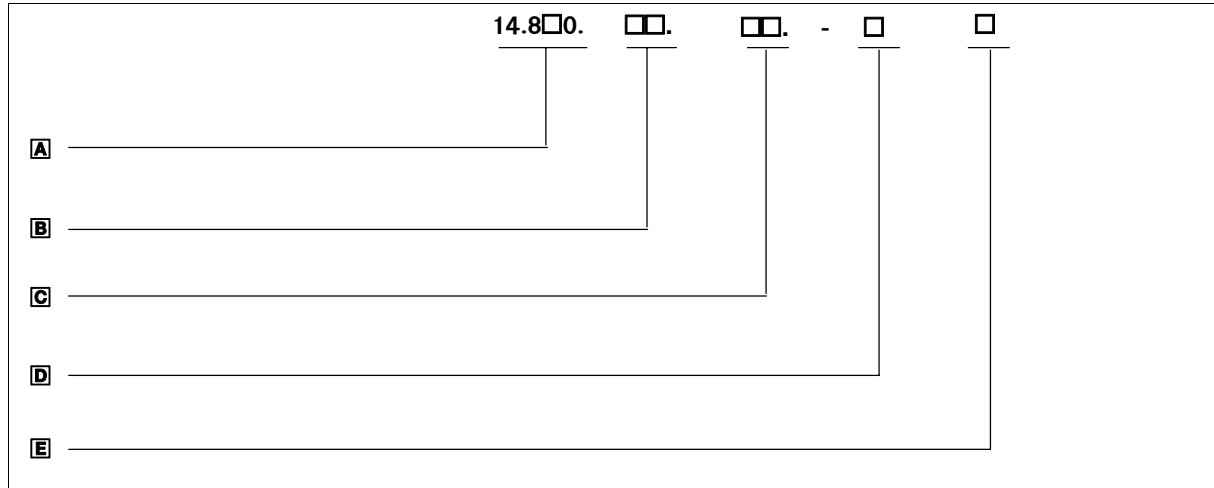
Material number	Version			Description
178761	1.0	11/2002	TD09	First edition
13211236	2.0	05/2007	TD09	Complete revision

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All information given in this documentation has been selected carefully and complies with the hardware and software described. Nevertheless, discrepancies cannot be ruled out. We do not take any responsibility or liability for any damage that may occur. Necessary corrections will be included in subsequent editions.

## Product key



<b>A Type</b>	14.800	without motor
	14.810	with motor
<b>B Frame size</b>	06; 08; 10; 12; 16	
<b>C Output-end version</b>	10	free output shaft, without foot, without flange
	11	free output shaft, with foot, without flange
	12	free output shaft, without foot, with flange
	13	free output shaft, with foot, with flange
	20	with hollow shaft, without foot, without flange
	21	with hollow shaft, without foot, with flange
	22	with hollow shaft, with foot, without flange
	23	with hollow shaft, with foot, with flange
<b>D Drive-end version</b>	1	splined armature plate, free drive shaft
	2	splined armature plate, free drive shaft and flange
	3	splined armature plate, hollow shaft, B5 flange
	4	splined armature plate, hollow shaft, B14 flange
	6	backlash-free diaphragm armature plate, free drive shaft
	7	backlash-free diaphragm armature plate, free drive shaft and flange
	8	backlash-free diaphragm armature plate, hollow shaft, B5 flange
	9	backlash-free diaphragm armature plate, hollow shaft, B14 flange
<b>E Variants</b>		Clutch / brake voltage Shaft diameter / bore diameter, flange diameter / foot height / terminal box position
	Motor:	Power - voltage Speed - frequency Degree of protection For available motor frame sizes, see catalogue

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# 1 Preface and general information

## 1.1 How to use these Operating Instructions

- These Operating Instructions inform about safety-relevant working on and with electromagnetic clutch-brake combinations. They contain safety information which must be observed.
- All persons working on or with the electromagnetic clutch-brake combinations must have the Operating Instructions available and observe the information and notes relevant for them.
- The Operating Instructions must always be in a complete and perfectly readable state.

## 1.2 Terminology used

Term	In the following text used for
CBC	Electromagnetic clutch-brake combination
Drive system	Drive system with electromagnetic clutch-brake combination and other drive components

## 1.3 Scope of supply

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

# 1 Preface and general information

## 1.4 Drive systems

### 1.4.1 Labelling

Drive systems and drive components are clearly labelled and defined by the indications on the nameplates.

Manufacturer: INTORQ GmbH & Co KG, Wülmser Weg 5, D-31855 Aerzen

- The clutch-brake combinations are also supplied as individual parts. The user combines them as desired. Specifications, especially nameplate and type code are valid for the clutch-brake combinations.
- If individual parts are supplied, there is no identification.

## 1.5 Legal regulations

### Liability

- The information, data and notes in these Operating Instructions met the state of the art at the time of printing. Claims referring to drive systems which have already been supplied cannot be derived from the information, illustrations and descriptions.
- We do not accept any liability for damage and operating interference caused by:
  - inappropriate use
  - unauthorised modifications to the drive system
  - improper working on and with the drive system
  - operating faults
  - disregarding these Operating Instructions

### Warranty

- Terms of warranty: see terms of sale and delivery of INTORQ GmbH & Co. KG.
- Warranty claims must be made to INTORQ immediately after detecting defects or faults.
- The warranty is void in all cases where liability claims cannot be made.

## 2 Safety instructions

### 2.1 General safety information

- These safety notes do not claim to be complete. If any questions or problems occur, please contact INTORQ GmbH & Co. KG.
- The clutch-brake combination met the state of the art at the time of delivery and is generally safe to operate.
- The clutch-brake combination endangers persons, the clutch-brake combination itself and other properties of the user if
  - non-qualified personnel work on and with the clutch-brake combination.
  - the clutch-brake combination is used inappropriately.
- The clutch-brake combinations must be planned in such a way that if they are correctly installed and used for their designed purpose in fault-free operation, they fulfil their function and do not put any persons at risk. This also applies to the interaction thereof with the overall system.
- Take appropriate measures to ensure that a failure of the clutch-brake combination will not lead to damage to material.
- Do not operate the clutch-brake combination unless it is in perfect condition.
- Retrofitting, modifications and changes of the clutch-brake combination are generally forbidden. In any case, INTORQ GmbH & Co. KG must be contacted beforehand.
- The friction lining and the friction surfaces must by no means have contact to oil or grease since even small amounts reduce the brake torque considerably.
- The brake torque will usually not be influenced if the brake is used under the environmental conditions that apply to IP44. Because of the numerous possibilities of using the brake, it is however necessary to check the functionality of all mechanical components under the corresponding operating conditions.

## 2 Safety instructions

### 2.2 Personnel responsible for safety

#### Operator

- An operator is any natural or legal person who uses the spring-applied brake or on whose behalf the spring-applied brake is used.
- The operator or his safety personnel must ensure
  - that all relevant regulations, notes and laws will be complied with,
  - that only qualified personnel will work on and with the drive system,
  - that the Operating Instructions will be available to the personnel working on and with the brake at all times,
  - that unqualified personnel will not be allowed to work on and with the spring-applied brake.

#### Skilled personnel

Skilled personnel are persons who -because of their education, experience, instructions, and knowledge about corresponding standards and regulations, rules for the prevention of accidents, and operating conditions -are authorised by the person responsible for the safety of the plant to perform the required actions and who are able to recognise potential hazards. (See IEC 364, definition of skilled personnel)

#### 2.2.1 Application as directed

- Drive systems
  - are intended for use in machinery and systems.
  - must only be used for the purposes ordered and confirmed.
  - must only be operated under the ambient conditions prescribed in these Operating Instructions.
  - must not be operated beyond their corresponding power limits.

**Any other use shall be deemed inappropriate!**




#### Application range of the clutch-brake combinations

- No explosive or aggressive atmosphere.
- Humidity, no restrictions.
- Ambient temperature -20°C to +40°C.
- With high humidity and low temperatures
  - Take measures to protect armature plate and rotor from freezing.
- Protect electrical connections against contact.






## 2 Safety instructions

### 2.3 Definition of notes used

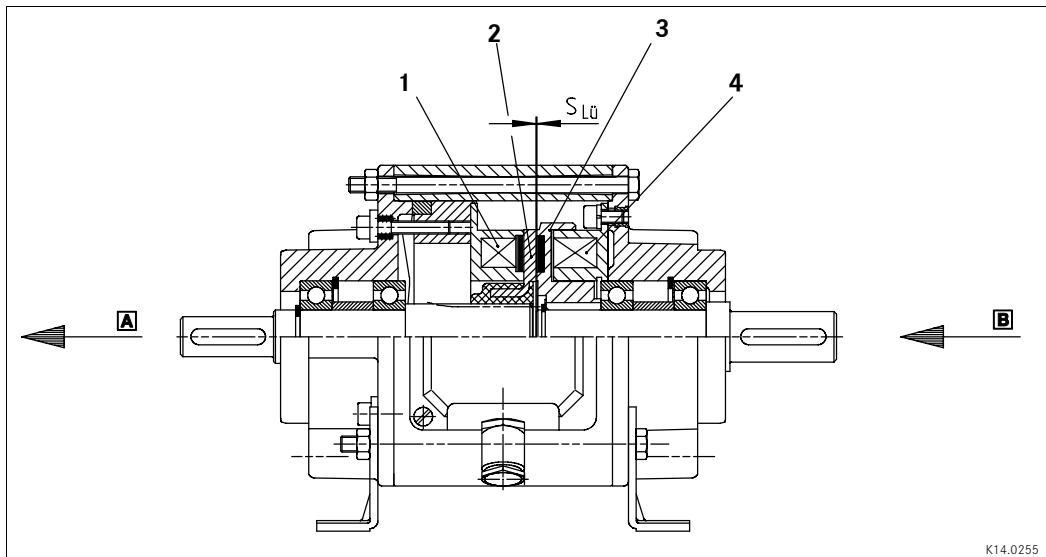
Pictograph and signal word	Meaning
 <b>Danger!</b>	<b>Danger of personal injury through dangerous electrical voltage</b> Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
 <b>Danger!</b>	<b>Danger of personal injury through a general source of danger</b> Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
 <b>Stop!</b>	<b>Danger of property damage</b> Reference to a possible danger that may result in property damage if the corresponding measures are not taken.

#### Application notes

Pictograph and signal word	Meaning
 <b>Note!</b>	Important note to ensure troublefree operation
 <b>Tip!</b>	Useful tip for simple handling
	Reference to another documentation

### 3 Technical data

#### 3.1 Product description



**Fig. 1 Design of a clutch-brake combination**

1	Brake stator	3	Rotor	A	Output
2	Armature plate	4	Clutch stator	B	Drive

##### 3.1.1 General information

The 14.800/810 clutch-brake units are electromagnetic encased units with asbestos-free friction lining.

The clutch-brake units are used to engage and disengage shafts in all areas of mechanical engineering. The modular system enables a great variety of variations and mounting positions. Clutches and brakes of the 14.105/115 series transmit the speed or brake torque by means of friction when DC voltage is applied.

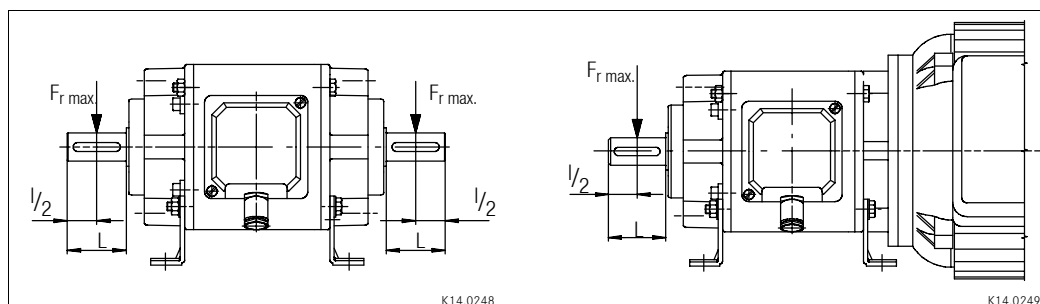
In addition to the splined armature plate that permits high switching frequencies, a back-lash-free torque transmission is ensured by the diaphragm armature plate. A low brake torque remains present even if the voltage is disconnected.

As the drive runs continuously with the clutch motor, the energy from the upstream drive can be used to accelerated the output.

## 3 Technical data

### 3.1.2 Shaft loads

The radial forces specified in the table relate to the centre of the shaft ends. " $F_{r \max.}$ " is the max. permissible radial force in relation to the shaft strength. Force " $F_{rated}$ " underlies a bearing service life of " $L_h$ " = 10 000 hours at " $n$ " = 1500 rpm.



**Fig. 2** Shaft load identification data

- $F$  = Permissible radial force in N  
 $F_r$  = Max. permissible radial force in N in relation to the shaft strength  
 $F_{rated}$  = Permissible radial force in N for  $L_h$  = 10 000h and  $n$  = 1500 rpm

CBC	Force	
	$F_{r \max.}$ [N]	$F_{rated}$ [N]
14.800/810.06	600	325
14.800/810.08	900	425
14.800/810.10	1300	590
14.800/810.12	1900	870
14.800/810.16	2300	1350

**Tab. 1** Radial forces

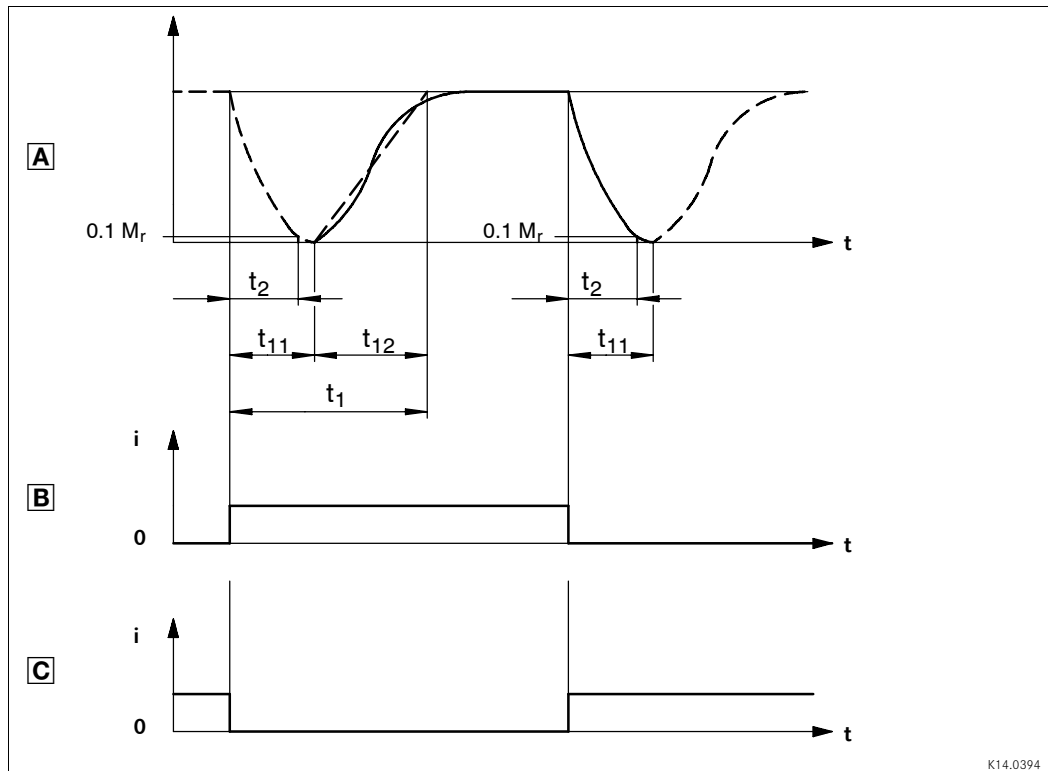


**Stop!**

The permissible radial forces (see Tab. 1) must not be exceeded!

### 3 Technical data

#### 3.2 Operating times



**Fig. 3 Clutch / brake operating times**

<b>A</b>	Rated torque	$t_{11}$	=	Reaction delay during engagement
<b>B</b>	Clutch excitation	$t_{12}$	=	Torque rise time
<b>C</b>	Brake excitation	$t_1$	=	Engagement time
0	= Off	$t_2$	=	Disengagement time:
i	= On	$t_2 \text{ brake}$	$\approx$	$t_{11} \text{ clutch}$
t	= Time	$t_2 \text{ clutch}$	$\approx$	$t_{11} \text{ brake}$

CBC	E clutch			E brake	
	$t_{11} \approx t_2$	$t_{12}$	$t_1$	$t_{12}$	$t_2$
14.800/810.06	20	35	55	25	45
14.800/810.08	25	70	95	30	55
14.800/810.10	35	85	120	50	85
14.800/810.12	50	120	170	75	125
14.800/810.16	65	145	210	85	150

**Tab. 2 Operating times in ms**

The transition from the state without brake torque to the steady brake torque is not without delay. The disengagement times are valid for switching on the DC side with an induction voltage of approx. 5 to 10 times nominal voltage. When switching on the AC side, the disengagement times increase approx. by the factor 6 compared to switching on the DC side. The chart shows the delay during engagement " $t_{11}$ ", the rise time of the brake torque " $t_{12}$ " and the engagement time " $t_1 = t_{11} + t_{12}$ " as well as the disengagement time " $t_2$ ".

### 3 Technical data

#### Disengagement time

The disengagement time can be shortened by special equipment for fast-response excitation or overexcitation.

#### 3.3 Rated data

Type 14.800/810		M <sub>r</sub> <sup>1)</sup>	P <sub>20</sub> <sup>2)</sup>		n <sub>max.</sub>	Q <sub>E</sub>	Q <sub>NA</sub>	Moments of inertia J x 10 <sup>-5</sup> [kgm <sup>2</sup> ]		
Armature plate version	Size	14.105 14.115	Clutch	Brake	[rpm]	[J]	[kwh]	Rotor	Armature plate	Drive shaft
with splined armature plate	06	7.5	15	11.5	3000	3.6 x 10 <sup>3</sup>	6.5	11.9	4.2	0.7
	08	15	20	16		6 x 10 <sup>3</sup>	11	26.6	13.9	2.4
	10	30	28	21		10 x 10 <sup>3</sup>	17	78	41.4	6.5
	12	60	35	28		16 x 10 <sup>3</sup>	42	226	120	15.8
	16	120	50	38		25 x 10 <sup>3</sup>	68	630	378	64
with backlash-free diaphragm armature plate	06	7.5	15	11.5		3.6 x 10 <sup>3</sup>	6.5	11.9	6.5	1.2
	08	15	20	16		6 x 10 <sup>3</sup>	11	26.6	25.3	3.7
	10	30	28	21		10 x 10 <sup>3</sup>	17	78	82.1	10.2
	12	60	35	28		16 x 10 <sup>3</sup>	42	226	241	23.3
	16	120	50	38		25 x 10 <sup>3</sup>	68	630	800	85

**Tab. 3 Rated CBC data**

- 1) Rated torque M<sub>r</sub> [Nm] related to the relative speed Δn = 100 rpm  
 2) P at 20 °C

### 3 Technical data

#### 3.4 Operating frequency / friction work

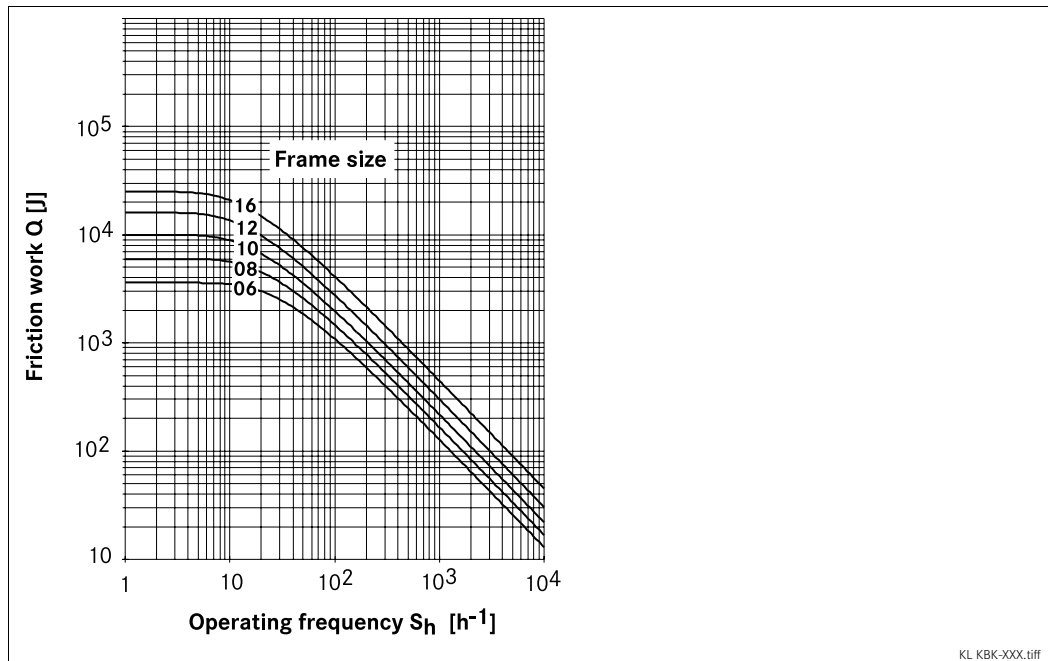


Fig. 4 Friction work as a function of the operating frequency for INTORQ 14.800/14.810

$$S_{hperm} = \frac{-S_{h\ddot{u}}}{\ln\left(1 - \frac{Q}{Q_E}\right)} \quad Q_{perm} = Q_E \left(1 - e^{\frac{-S_{h\ddot{u}}}{S_h}}\right)$$

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

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

## 4 Mechanical installation



### **Danger!**

The clutch-brake combination must only be installed when no voltage is applied!



### **Stop!**

In any mounting position, ensure that no liquid or foreign particles ingress into the housings!

### 4.1 Mounting

#### 4.1.1 Preparation

1. Unpack clutch-brake combination.
2. Check for completeness.
3. Check whether the nameplate data correspond to the accompanying papers.

#### 4.1.2 Installation

The drives can be used in either a horizontal or vertical mounting position.



### **Note!**

A vertical mounting position makes motor and gearbox mounting easier.



### **Stop!**

- Avoid shocks onto shafts and hollow shafts!
- Grease shafts and hollow shafts only lightly!
- The friction linings of rotor and brake must be kept free of grease and oil!

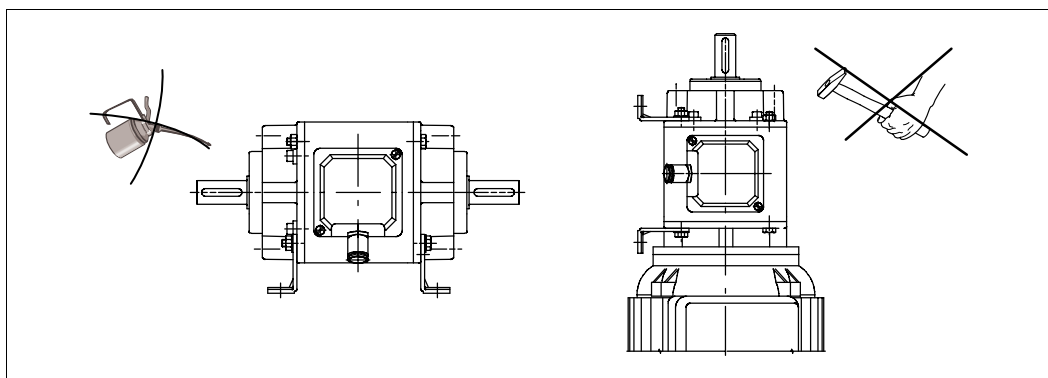


Fig. 5 Mounting instructions

## 4 Mechanical installation

### 4.2 Disassembly

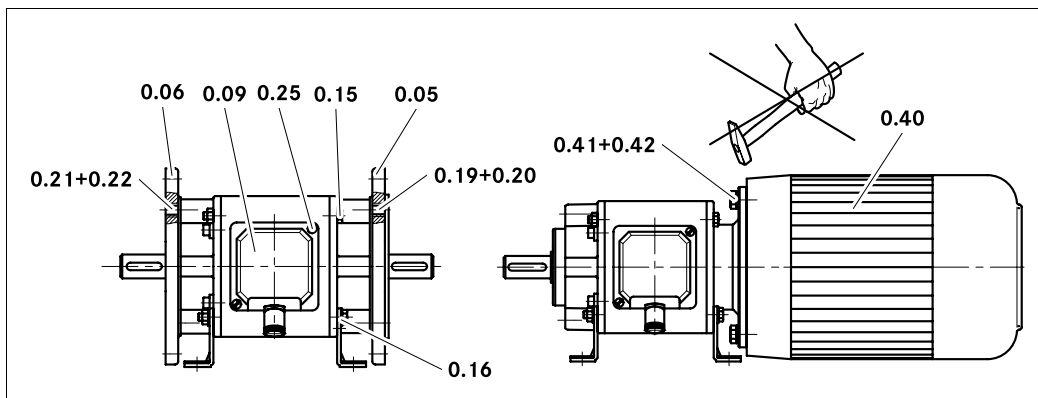


Fig. 6 Version; 14.800□□.13.2(7)

14.810□□.11.4(9)

1. Interrupt the power supply.
2. Loosen Allen screws (0.25), remove terminal box (0.09).
3. Loosen pigtails, remove terminal strip.
4. Loosen hexagon socket head cap screws (0.41) with spring washer (0.42) and remove motor (0.40) from CBC.



### Stop!

Avoid shocks! Carefully loosen flange cutouts!

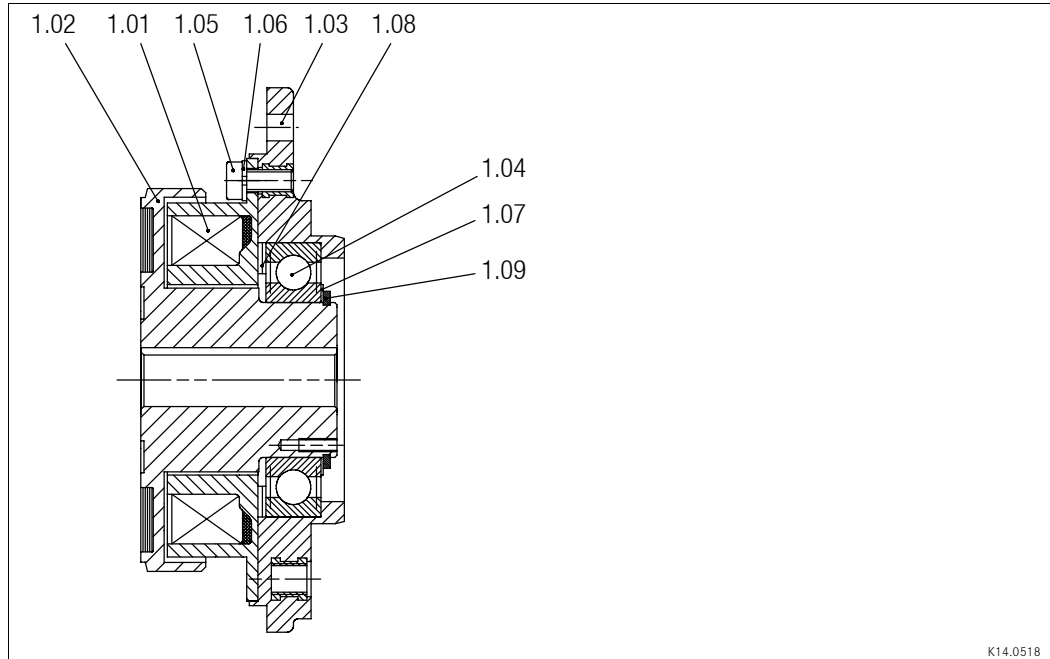
5. Loosen Allen screws (0.21), remove flange (0.06).
6. Loosen hexagon socket head cap screws (0.15 and 0.16).
7. Remove drive and output cover.



## 4 Mechanical installation

### 4.2.1 Disassembly of complete drive cover

#### Version 1.00



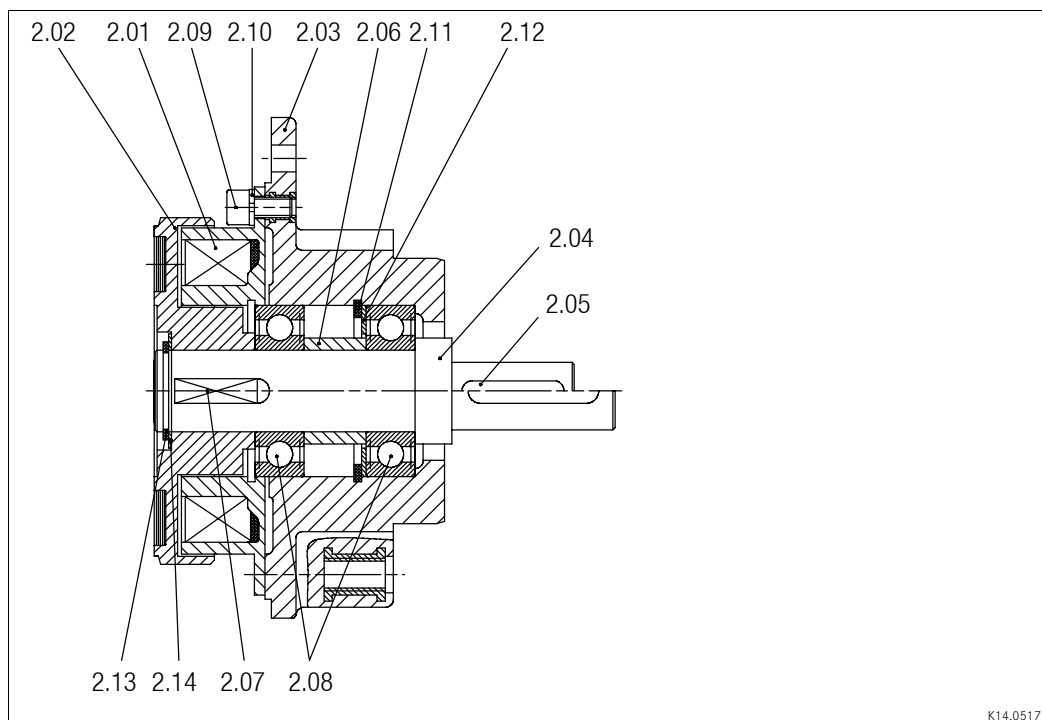
**Fig. 7 Drive cover 1.00**

1.01	Stator	1.06	Spring washer
1.02	Rotor	1.07	Shim
1.03	Cover	1.08	Shim
1.04	Ball bearing	1.09	Circlip
1.05	Allen screw		

1. Remove circlip (1.09) and shims (1.07).
2. Press rotor (1.02) out of ball bearing (1.04).
3. Loosen Allen screws (1.05), remove stator (1.01).
4. Remove shims (1.08).
5. Press ball bearing (1.04) out of cover (1.03).

## 4 Mechanical installation

### Version 2.00



**Fig. 8 Drive cover 2.00**

2.01	Stator	2.08	Deep-groove ball bearing
2.02	Rotor	2.09	Allen screw
2.03	Cover	2.10	Spring washer
2.04	Shaft	2.11	Circlip
2.05	Key	2.12	Shim
2.06	Socket	2.13	Circlip
2.07	Key	2.14	Shim

1. Remove circlip (2.13) and shim (2.14).
2. Press shaft (2.04) out of cover (2.03).



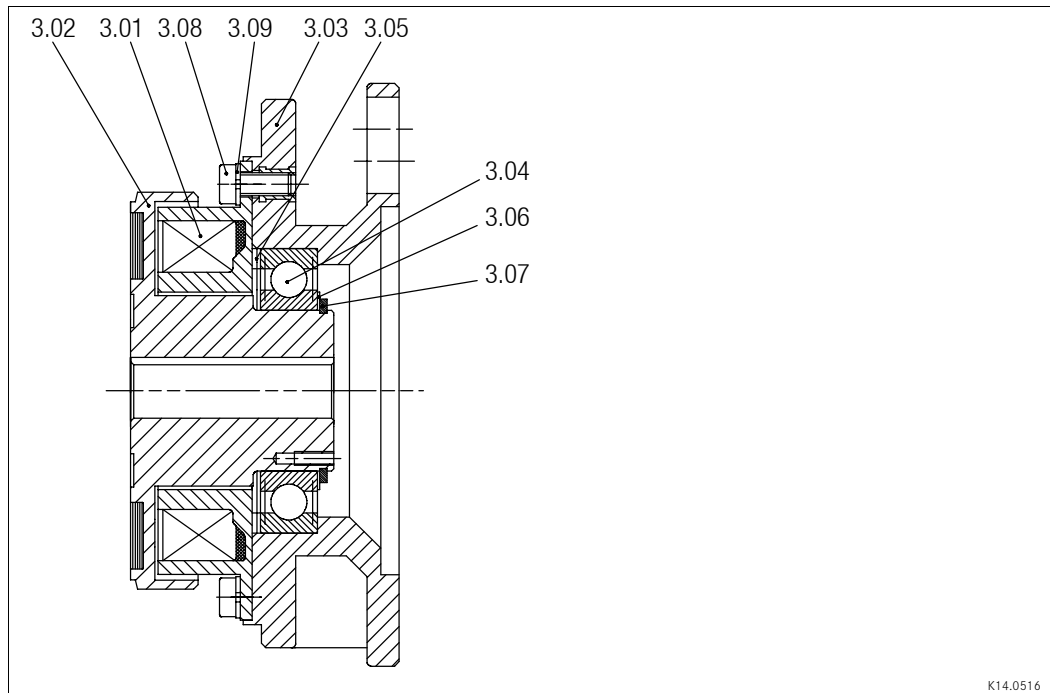
#### Note!

Keyway must not be covered by the pin!

3. Loosen Allen screws (2.09), remove stator (2.01).
4. Press out ball bearing (2.08), remove socket (2.06).
5. Remove circlip (2.11) and shim (2.12).
6. Press out ball bearing (2.08).

## 4 Mechanical installation

### Version 3.00



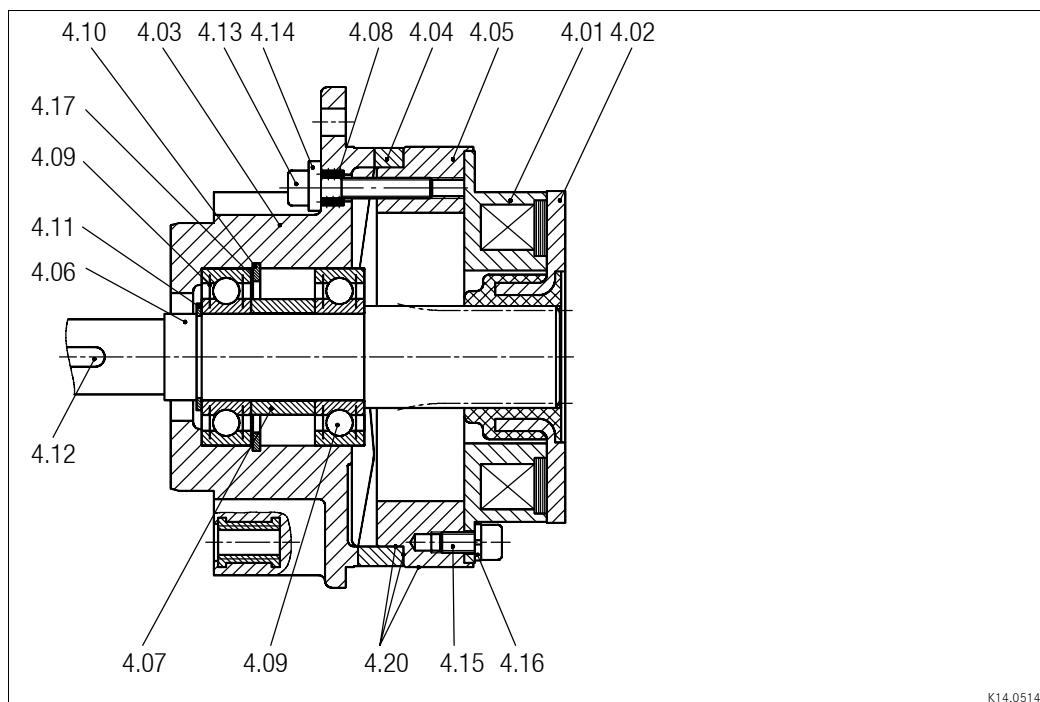
**Fig. 9 Drive cover 3.00**

3.01	Stator	3.06	Shim
3.02	Rotor	3.07	Circlip
3.03	Flange	3.08	Allen screw
3.04	Deep-groove ball bearing	3.09	Spring washer
3.05	Shim		

1. Remove circlip (3.07) and shim (3.06).
2. Press rotor (3.02) out of ball bearing (3.04).
3. Loosen Allen screws (3.08), remove stator (3.01).
4. Remove shim (3.05).
5. Press ball bearing (3.04) out of flange (3.03).

## 4 Mechanical installation

### Version 4.00



**Fig. 10 Drive cover 4.00**

4.01	Stator	4.10	Circlip
4.02	Armature plate	4.11	Circlip
4.03	Cover	4.12	Key
4.04	Setting ring	4.13	Allen screw
4.05	Flange	4.14	Washer
4.06	Shaft	4.15	Allen screw
4.07	Socket	4.16	Spring washer
4.08	Compression spring	4.17	Shim
4.09	Deep-groove ball bearing	4.20	Mounting paste

1. Remove armature plate (4.02) from splined shaft (4.06).
2. Loosen Allen screws (4.13), remove washer (4.14), compression spring (4.08) and setting ring (4.04).
3. Loosen Allen screws (4.15), remove stator (4.01) from flange (4.05).
4. Remove circlip (4.11), press out shaft (4.06).
5. Press out ball bearing (4.09), remove socket (4.07).
6. Remove circlip (4.10) and shim (4.17).
7. Press ball bearing (4.09) out of cover (4.03).



#### Note!

Mounting is carried out in inverse order!

## 4

## Mechanical installation

## Version 5.00

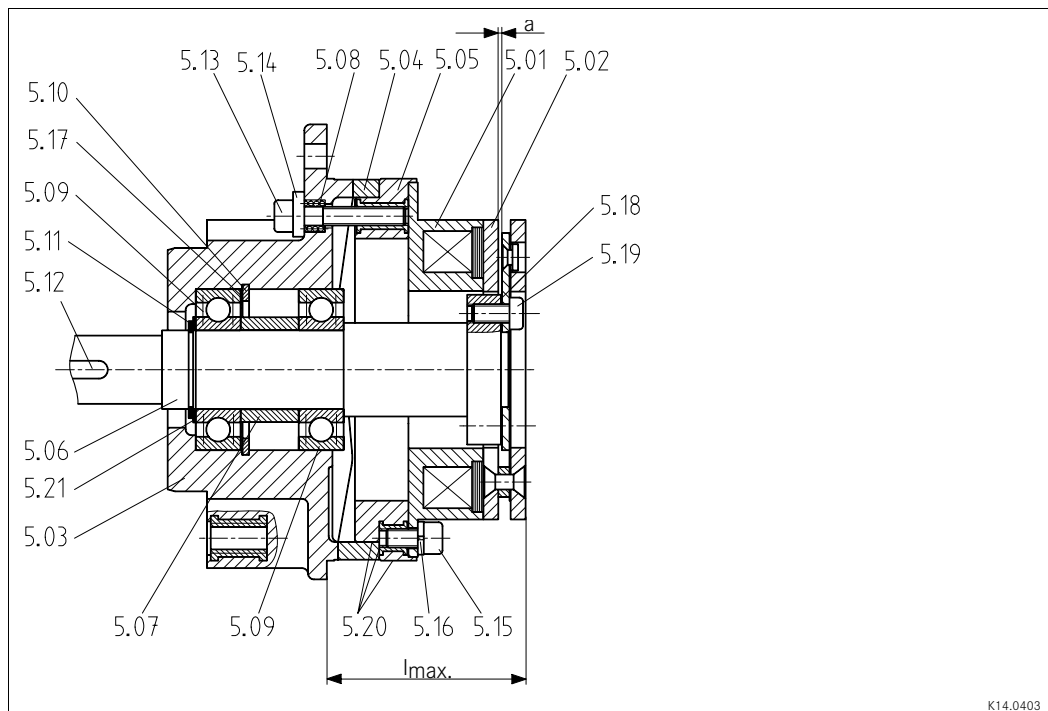


Fig. 11 Drive cover 5.00

5.01	Stator	5.12	Key
5.02	Armature plate	5.13	Allen screw
5.03	Cover	5.14	Washer
5.04	Setting ring	5.15	Allen screw
5.05	Flange	5.16	Spring washer
5.06	Shaft	5.17	Shim
5.07	Socket	5.18	Washer
5.08	Compression spring	5.19	Allen screw
5.09	Deep-groove ball bearing	5.20	Mounting paste
5.10	Circlip	5.21	Shim
5.11	Circlip		

1. Loosen Allen screws (5.19), remove armature plate (5.02) and washers (5.18).
2. Loosen Allen screws (5.13), remove washers (5.14), compression springs (5.08) and setting ring (5.04).
3. Loosen Allen screws (5.15), remove stator (5.01) from flange (5.05).
4. Remove circlip (5.11), press out shaft (5.06).
5. Press out ball bearing (5.09), remove socket (5.07).
6. Remove circlip (5.10) and shims (5.17).
7. Press ball bearing (5.09) out of cover (5.03).

## 4 Mechanical installation

### 4.2.2 Assembly of complete output cover, version 5.00

1. Use washers (5.17) to compensate for axial play.
2. Screw down Allen screws (5.13) so that the compression springs (5.08) are only slightly prestressed.
3. Screw armature plate (5.02) onto shaft (5.06) and set dimension " $l_{\max.}$ " (see Tab. 4) using the setting ring (5.04).
4. Tighten Allen screws (5.13).
5. Check dimension " $a$ " using a feeler gauge, determine the difference between dimension and table dimension, and select washers (5.18) with a corresponding thickness.
6. Unscrew armature plate (5.02) from shaft (5.06) and insert washers (5.18) between armature plate (5.02) and shaft shoulder.
7. Provide Allen screw threads (5.19) with glue and screw down armature plate (5.02).

CBC	A [mm]	$l_{\max.}$ [mm]	$M_a$ [mm]
14.800/810.06	1.2	45.8	3.6
14.800/810.08	1.2	53.4	7.1
14.800/810.10	1.5	61.9	12.0
14.800/810.12	2.0	71.3	30.0
14.800/810.16	2.8	82.3	60.0

**Tab. 4 Mounting dimensions**

## 4

## Mechanical installation

INTORQ

## Version 6.00

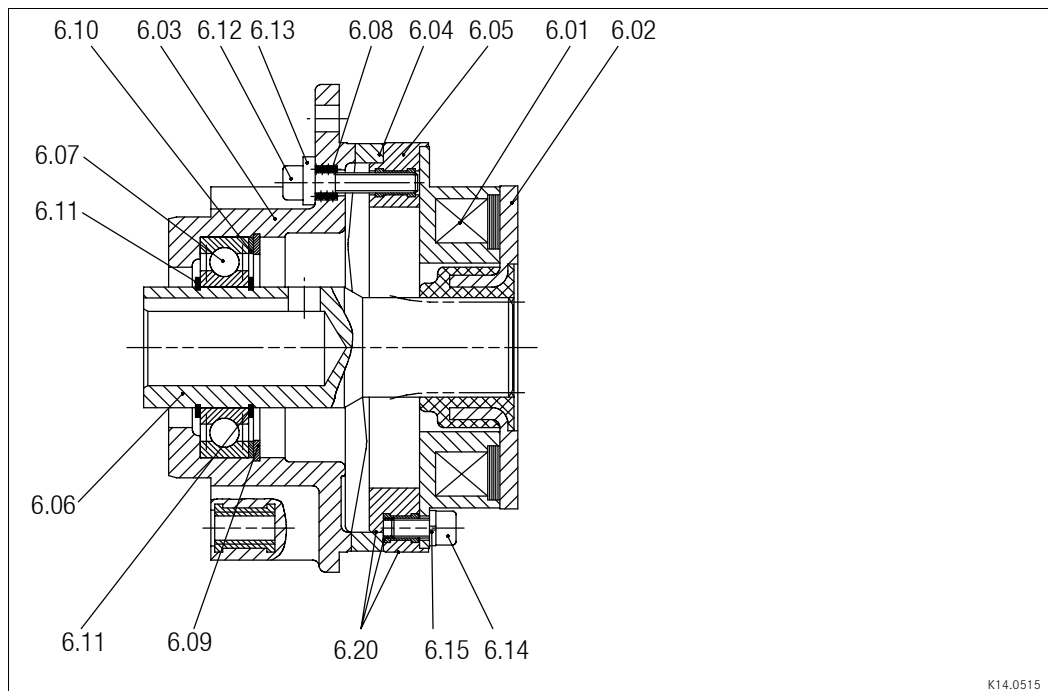


Fig. 12 Drive cover 6.00

6.01	Stator	6.09	Circlip
6.02	Armature plate	6.10	Shim
6.03	Cover	6.11	Circlip
6.04	Setting ring	6.12	Allen screw
6.05	Flange	6.13	Washer
6.06	Hollow shaft	6.14	Allen screw
6.07	Deep-groove ball bearing	6.15	Spring washer
6.08	Compression spring	6.20	Mounting paste

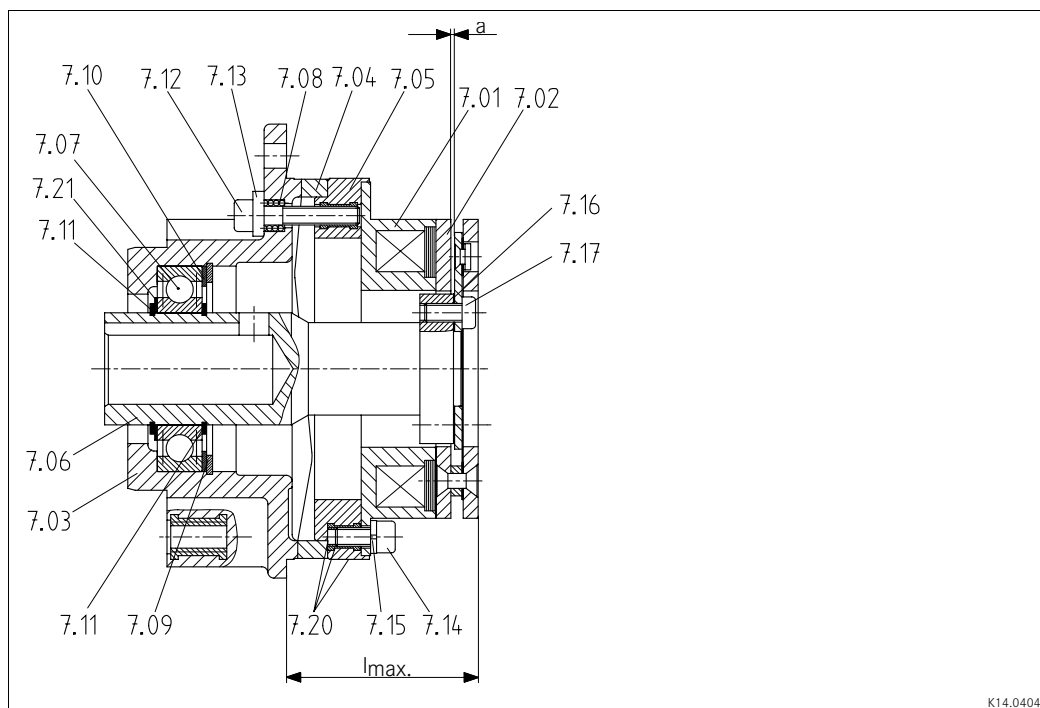
1. Remove armature plate (6.02) from splined hollow shaft (6.06).
2. Loosen Allen screws (6.12), remove washers (6.13), compression springs (6.08) and setting ring (6.04).
3. Loosen Allen screws (6.14), remove stator (6.01) from flange (6.05).
4. Remove circlips (6.11) and circlip (6.09) with shims (6.10). Press out hollow shaft (6.06).
5. Press out ball bearing (6.07).

**Note!**

Mounting is carried out in inverse order!

## 4 Mechanical installation

### Version 7.00



**Fig. 13 Drive cover 7.00**

7.01	Stator	7.11	Circlip
7.02	Armature plate	7.12	Allen screw
7.03	Cover	7.13	Washer
7.04	Setting ring	7.14	Allen screw
7.05	Flange	7.15	Spring washer
7.06	Hollow shaft	7.16	Washer
7.07	Deep-groove ball bearing	7.17	Allen screw
7.08	Compression spring	7.20	Mounting paste
7.09	Circlip	7.21	Shim
7.10	Shim		

1. Loosen Allen screws (7.17), remove armature plate (7.02) and washers (7.16).
2. Loosen Allen screws (7.12), remove washers (7.13), compression springs (7.08) and setting ring (7.04).
3. Loosen Allen screws (7.14), remove stator (7.01) from flange (7.05).
4. Remove circlip (7.11) and circlip (7.09) with shims (7.10). Press out hollow shaft (7.06).
5. Press out ball bearing (7.07).



## 4 Mechanical installation

### 4.2.3 Assembly of complete output cover, version 7.00

1. Press deep-groove ball bearing (7.07) into cover (7.03) and fix with circlip (7.09) and shim (7.10).
2. Mount circlip (7.11) onto hollow shaft (7.06), press hollow shaft (7.06) into cover (7.03), mount circlip (7.11) and shims (7.21).
3. Use Allen screw (7.12), shim (7.13) and spring (7.08) to fix flange (7.05) with setting ring (7.04) at the cover (7.03). Screw down Allen screw (7.12) so that the compression springs (7.08) are only slightly prestressed.
4. Screw armature plate (7.02) onto hollow shaft (7.06) and set dimension " $l_{\max.}$ " (Tab. 4) using the setting ring (7.11).
5. Tighten Allen screws (7.12).
6. Check dimension "a" using a feeler gauge, determine the difference between dimension and table dimension, and select washers (7.16) with a corresponding thickness.
7. Unscrew armature plate (7.02) from hollow shaft (7.06) and insert washers between armature plate and shaft shoulder.
8. Provide Allen screw threads (7.17) with glue and screw down armature plate (7.02).

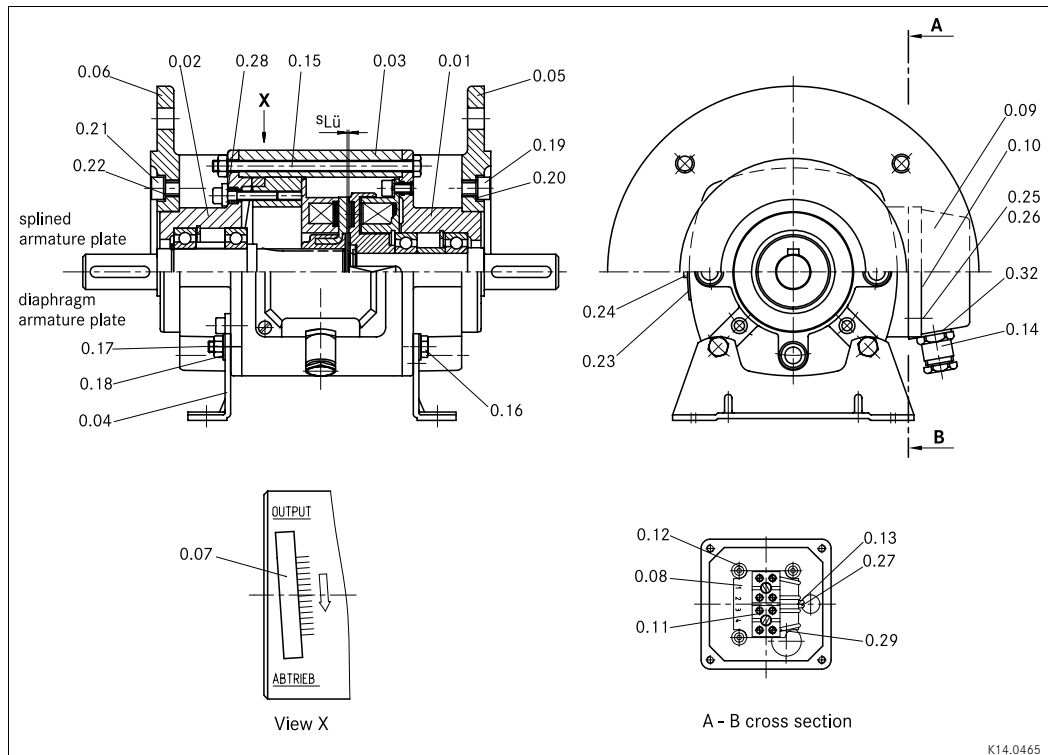
CBC	A [mm]	$l_{\max.}$ [mm]	$M_a$ [mm]
14.800/810.06	1.2	45.8	3.6
14.800/810.08	1.2	53.4	7.1
14.800/810.10	1.5	61.9	12.0
14.800/810.12	2.0	71.3	30.0
14.800/810.16	2.8	82.3	60.0

Tab. 5 Mounting dimensions

## 4 Mechanical installation

### 4.3 Mounting

#### 4.3.1 Complete CBC



1. Press complete drive cover (1.00 / 2.00 / 3.00) into housing (0.03) leading the pigtails through the bore provided into the terminal box.
2. Press complete output cover (4.00 / 5.00 / 6.00 / 7.00) into housing (0.03) leading the pigtails through the bore provided into the terminal box.
3. Use hexagon socket head cap screws (0.15) and hexagon nuts (0.17) to screw complete drive and complete output cover onto housing (0.03).
4. For foot mounting: Use hexagon socket head cap screws (0.16) and hexagon nuts (0.17) to screw down feet (0.04).
5. Fit clamping plate (0.08) and terminal strip (0.11) and screw down using Allen screws (0.12).
6. Cut pigtail to length, fit wire end ferrules (0.29), and connect as shown on clamping plate (0.08) black/blue for clutch and brake.
7. Combine pigtails using cable tie (0.13).
8. Set air gap, see chapter 6.2.1, wear adjustment.
9. Fit protection cover (0.07) onto housing (0.03).
10. Assembly of terminal box (0.09) and screwed connection (0.14).

## 4 Mechanical installation

11. Screw seal (0.10) and terminal box (0.09) onto housing (0.03) using Allen screws (0.25) and washers (0.26).
12. For flange mounting at the drive end: Screw down flange (0.05) using spring washer (0.20) and Allen screws (0.19).
13. For flange mounting at the output end: Screw down flange (0.06) using spring washers (0.22) and Allen screws (0.21).

## 5 Electrical installation

The CBCs are supplied with direct current, the coil voltage is indicated on the nameplate.



### **Danger!**

Perform electrical connection only when no voltage is applied.

The performance of both clutch and brake coils must be taken into account when dimensioning a transformer rectifier.

### **DC switching**

DC switching means short switch-on and switch-off times that can be reduced further by using SEGC high-speed switchgears.

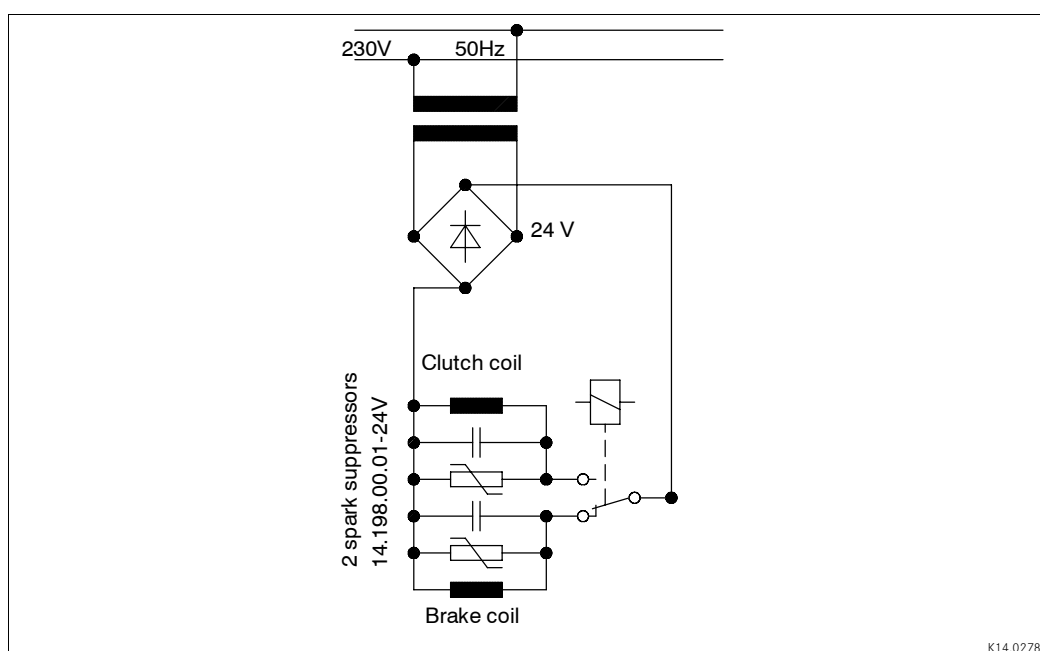


Fig. 14 Clutch and brake are energised to engage

## 5 Electrical installation

### Spark suppressor

#### INTORQ 14.198.00.0□

When switching on the DC side, the INTORQ spark suppressor protects coil and contact from excessive inductive voltages. If there is no protective circuit, the inductive voltage can be higher than the values specified in VDE 0580. This can lead to coil failures.

Application area

- Spark suppression at switching contacts
- Limitation of inductive coil voltage
- Increase in service life of coils and contacts
- Additional protection for rectifiers operated on mains with extreme interference voltage peaks
- Compliance with VDE 0580 § 26
- Reduction of switch-off times of clutch, brakes and spring-operated brakes

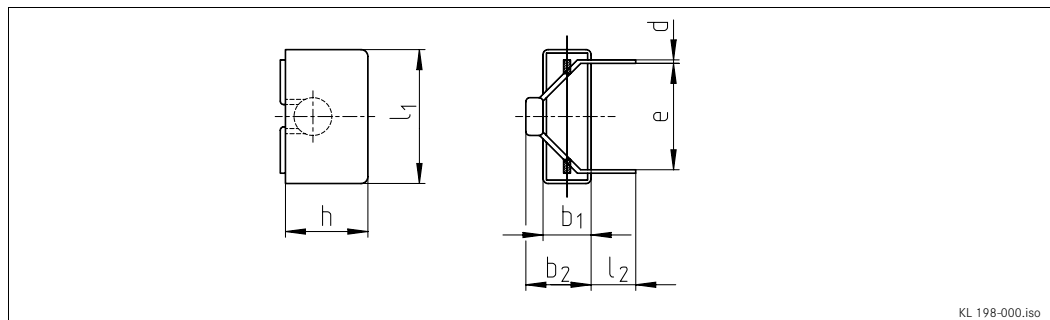


Fig. 15 Dimensions

Four versions of the INTORQ spark suppressor are available for the following voltage ranges:

Type	Coil voltage	Max. supply voltage	Max. coil power	Capacitor voltage	b <sub>1</sub>	b <sub>2</sub>	d	e	h	l <sub>1</sub>	l <sub>2</sub>	m
	[V]	[V~]	[W]	[V~]	[mm]							[kg]
14.198.00.01	24-50	60	110	250	8.5	12.5	0.7	22.5	18.5	26.5	25	7
14.198.00.02	50-120	250		630	15	21			26	41.5	20	22
14.198.00.03	120-200	400		1000	13	20		37.5	24		15	17
14.198.00.04	200-250	555										

### Connection example

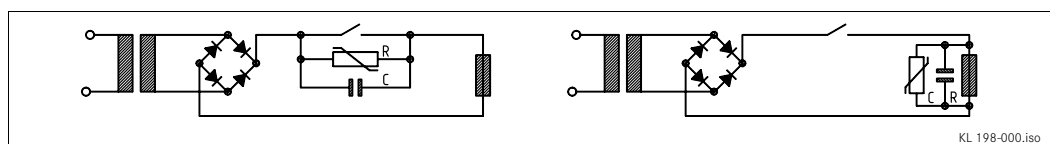


Fig. 16 Parallel to contact

Parallel to coil

## 6 Maintenance/repair

### 6.1 Inspection intervals



#### Note!

Checking and readjusting the air gap at regular intervals ensures correct operation (see chapter 6.2.1). In applications with high friction work, the air gap should be checked and readjusted at shorter time intervals.

### 6.2 Maintenance



#### Danger!

Repairs must only be carried out when the machine is at standstill and the power supply is interrupted!



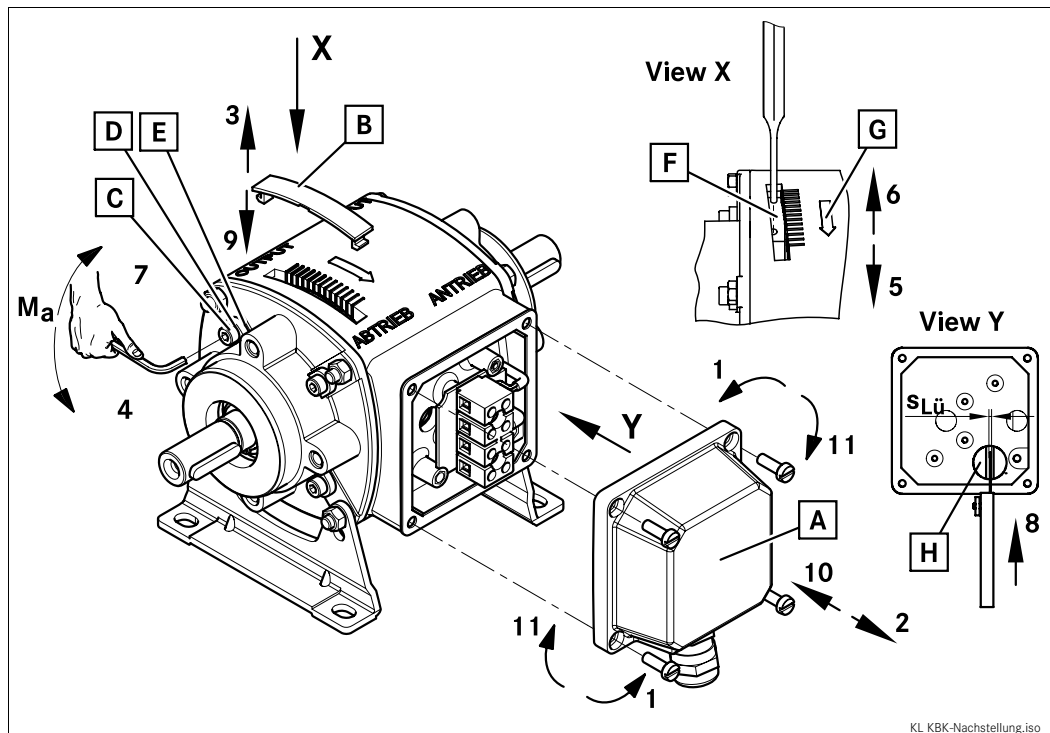
#### Stop!

Remove or secure all loads acting on the CBC.

## 6 Maintenance/repair

### 6.2.1 Air gap readjustment

Air gap compensation can be carried out quickly and without disassembling the clutch-brake combination thanks to patented wear adjustment.



**Fig. 17 CBC air gap setting**

1. Unscrew screws from the terminal box cover (A).
2. Remove terminal box cover (A).
3. Remove cover (B).
4. Loosen Allen screws (C) using a hexagon screwdriver (see Tab. 6) until the springs (E) below the washers (D) are released.
5. Turn setting ring (F) with pin (see Tab. 6) in the direction indicated by the arrow (G) until you can feel a resistance.
6. Turn back setting ring with pin by approx. one graduation mark against the direction indicated by the arrow (G).
7. Tighten Allen screws (C) (for tightening torques, see Tab. 6).
8. Use a feeler gauge to check air gap "s<sub>air</sub>" (see Tab. 6) through check bore hole (H) in the terminal box. If necessary, repeat steps 4 - 8.
9. Fit cover (B).
10. Fit terminal box cover (A).
11. Tighten screws on the terminal box cover.

## 6 Maintenance/repair

CBC	Rated air gap $s_{air}$ [mm]	Tightening torque $M_a$ [Nm]	Pin diameter $D$ [mm]	Hexagon screwdriver
14.800/810.06	0.15 - 0.25	3	3	3
14.800/810.08		6		4
14.800/810.10		10	4	5
14.800/810.12	0.2	20	6	6
14.800/810.16	0.35			

Tab. 6 Air gap data

### 6.2.2 Order details

If the readjustment range for the clutch-brake combination is exhausted, the wearing parts must be replaced.

■ Wearing parts are:

- Rotor
- Armature plate
- Brake stator

The maximum readjustment range is reached when the mark at the setting ring has reached the end of the housing slot. Please indicate the nameplate data, type designation, voltage, and bore hole diameter in your order.

Example	INTORQ	14.800	10.	10.	1	Nameplate data
Type						
Size						
Output-end version						
Drive-end version						

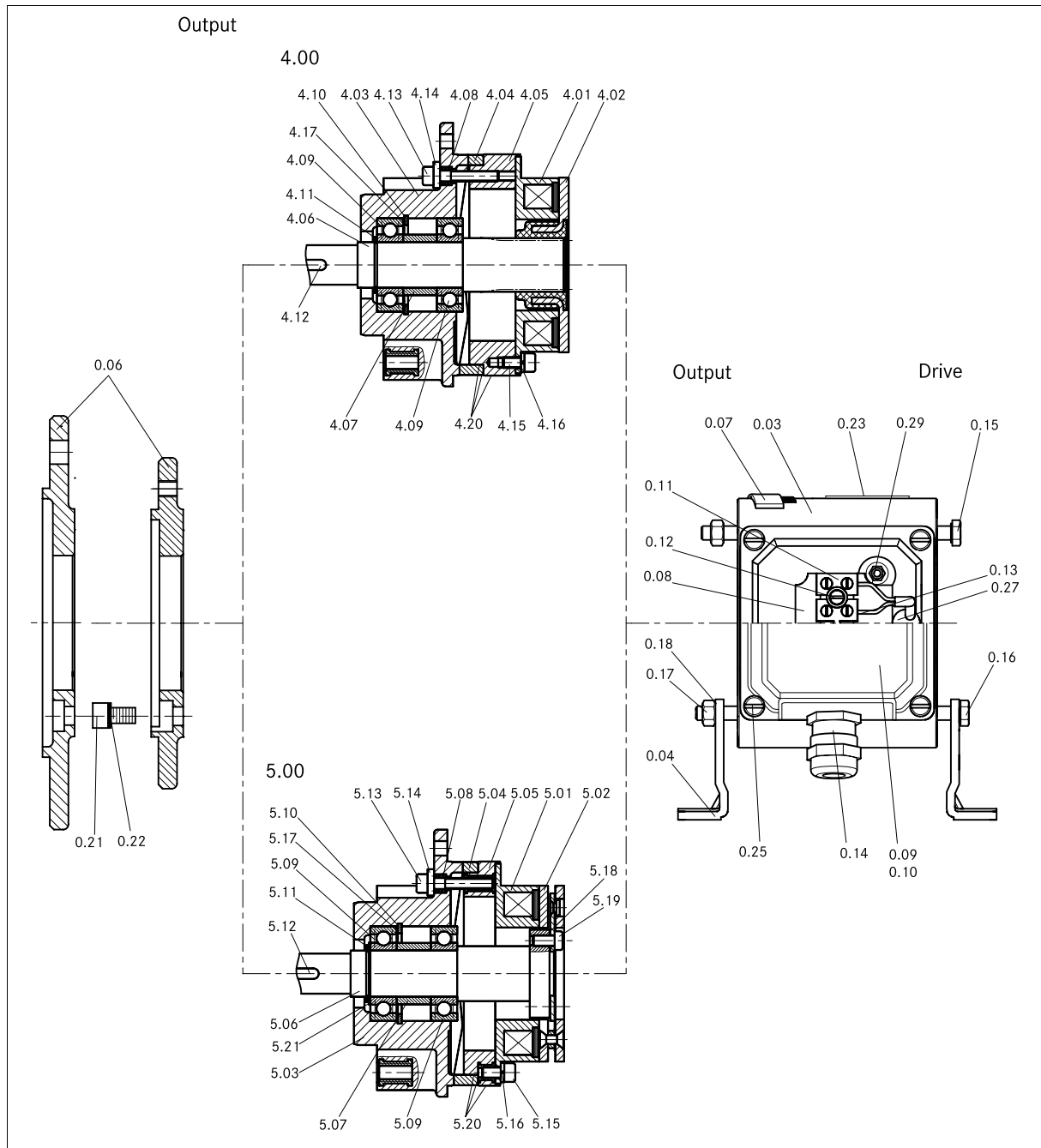


## 6 Maintenance/repair

## 6 Maintenance/repair

### 6.3 Spare-parts list

#### 6.3.1 CBC output-end versions 4.00 and 5.00



## 6

## Maintenance/repair

**CBC - complete housing**

0.03	Housing	0.11	Terminal strip	0.18	Washer
0.04	Foot	0.12	Allen screw	0.21	Allen screw
0.06	Output flange	0.13	Cable tie	0.22	Washer
0.07	Cap	0.14	Screwed connection	0.23	Nameplate
0.08	Clamping plate	0.15	Hexagon socket head cap screw	0.25	Allen screw
0.09	Terminal box	0.16	Hexagon socket head cap screw	0.27	Insulation sleeving
0.10	Seal	0.17	Hexagon nut	0.29	Wire end ferrule

**Complete output cover, version 4.00**

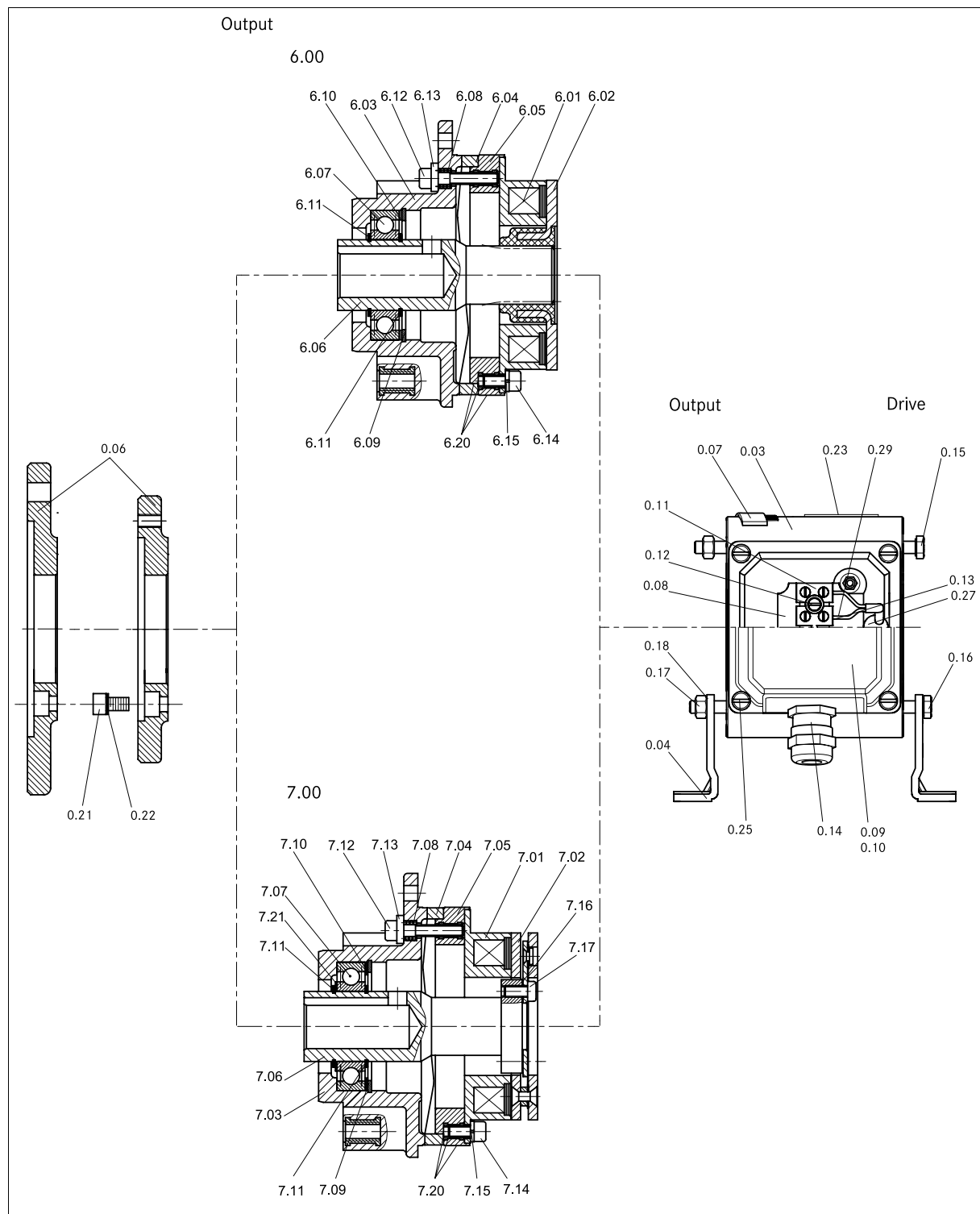
4.01	Stator	4.07	Socket	4.13	Allen screw
4.02	Armature plate	4.08	Compression spring	4.14	Washer
4.03	Cover	4.09	Deep-groove ball bearing	4.15	Allen screw
4.04	Setting ring	4.10	Circlip	4.16	Spring washer
4.05	Flange	4.11	Circlip	4.17	Shim
4.06	Shaft	4.12	Key	4.20	Mounting paste

**Complete output cover, version 5.00**

5.01	Stator	5.08	Compression spring	5.15	Allen screw
5.02	Armature plate	5.09	Deep-groove ball bearing	5.16	Spring washer
5.03	Cover	5.10	Circlip	5.17	Shim
5.04	Setting ring	5.11	Circlip	5.18	Washer
5.05	Flange	5.12	Key	5.19	Allen screw
5.06	Shaft	5.13	Allen screw	5.20	Mounting paste
5.07	Socket	5.14	Washer	5.21	Shim

## 6 Maintenance/repair

### 6.3.2 CBC output-end versions 6.00 and 7.00



## 6

**Maintenance/repair****CBC - complete housing**

0.03	Housing	0.11	Terminal strip	0.18	Washer
0.04	Foot	0.12	Allen screw	0.21	Allen screw
0.06	Output flange	0.13	Cable tie	0.22	Washer
0.07	Cap	0.14	Screw connection	0.23	Nameplate
0.08	Clamping plate	0.15	Hexagon socket head cap screw	0.25	Allen screw
0.09	Terminal box	0.16	Hexagon socket head cap screw	0.27	Insulation sleeving
0.10	Seal	0.17	Hexagon nut	0.29	Wire end ferrule

**Complete output cover, version 6.00**

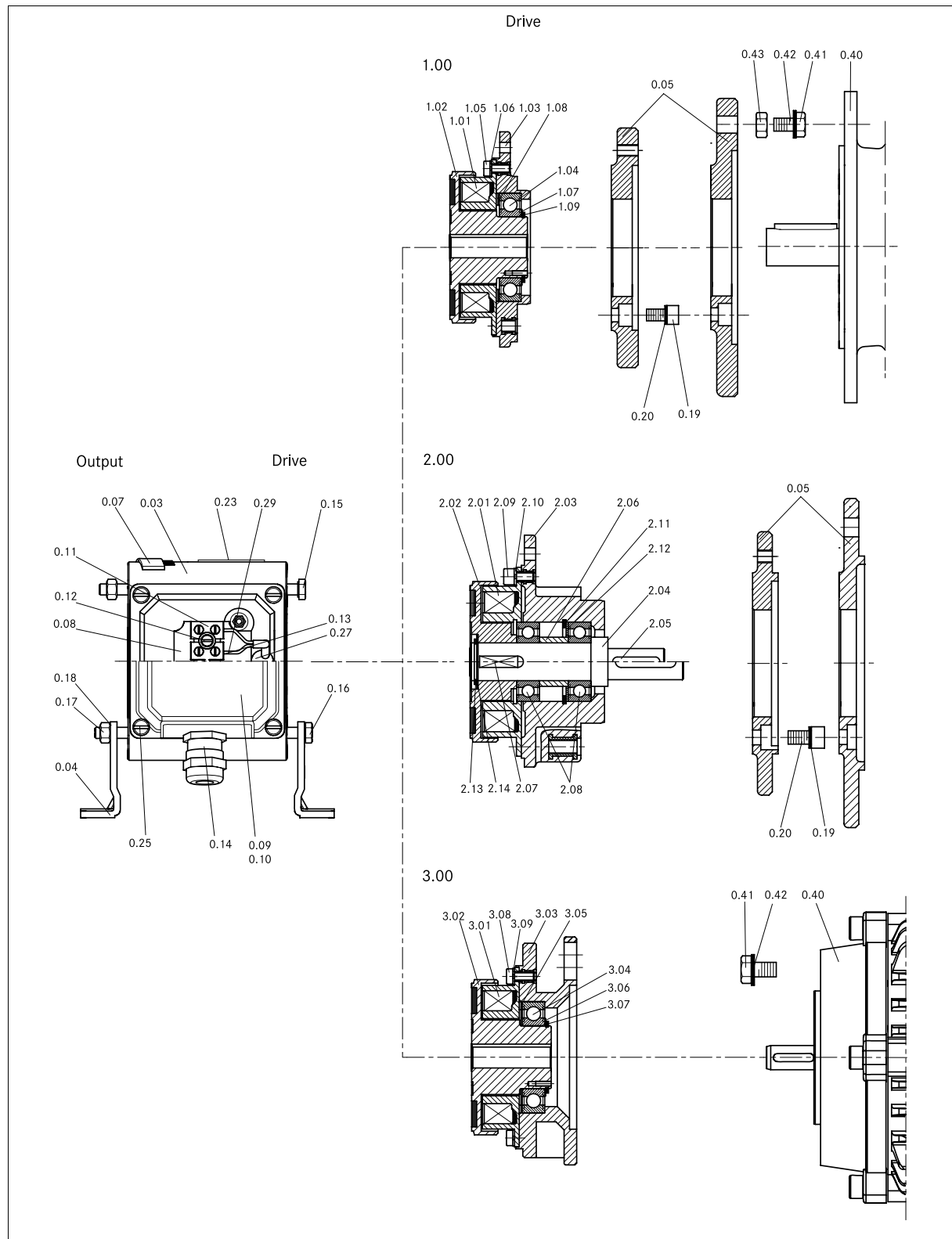
6.01	Stator	6.07	Deep-groove ball bearing	6.13	Washer
6.02	Armature plate	6.08	Compression spring	6.14	Allen screw
6.03	Cover	6.09	Circlip	6.15	Spring washer
6.04	Setting ring	6.10	Shim	6.20	Mounting paste
6.05	Flange	6.11	Circlip		
6.06	Hollow shaft	6.12	Allen screw		

**Complete output cover, version 7.00**

7.01	Stator	7.08	Compression spring	7.15	Spring washer
7.02	Armature plate	7.09	Circlip	7.16	Washer
7.03	Cover	7.10	Shim	7.17	Allen screw
7.04	Setting ring	7.11	Circlip	7.20	Mounting paste
7.05	Flange	7.12	Allen screw	7.21	Shim
7.06	Hollow shaft	7.13	Washer		
7.07	Deep-groove ball bearing	7.14	Allen screw		

## 6 Maintenance/repair

### 6.3.3 CBC drive-end versions 1.00, 2.00 and 3.00



## 6

## Maintenance/repair

**CBC - complete housing**

0.03	Housing	0.13	Cable tie	0.25	Allen screw
0.04	Foot	0.14	Screwed connection	0.27	Insulation sleeving
0.05	Drive flange	0.15	Hexagon socket head cap screw	0.29	Wire end ferrule
0.07	Cap	0.16	Hexagon socket head cap screw	0.40	Motor
0.08	Clamping plate	0.17	Hexagon nut	0.41	Hexagon socket head cap screw
0.09	Terminal box	0.18	Washer	0.42	Spring washer
0.10	Seal	0.21	Allen screw	0.43	Hexagon nut
0.11	Terminal strip	0.22	Washer		
0.12	Allen screw	0.23	Nameplate		

**Complete drive cover, version 1.00**

1.01	Stator	1.04	Deep-groove ball bearing	1.07	Shim
1.02	Rotor	1.05	Allen screw	1.08	Shim
1.03	Cover	1.06	Spring washer	1.09	Circlip

**Complete drive cover, version 2.00**

2.01	Stator	2.06	Socket	2.11	Circlip
2.02	Rotor	2.07	Key	2.12	Shim
2.03	Cover	2.08	Deep-groove ball bearing	2.13	Circlip
2.04	Shaft	2.09	Allen screw	2.14	Shim
2.05	Key	2.10	Spring washer		

**Complete drive cover, version 3.00**

3.01	Stator	3.04	Deep-groove ball bearing	3.07	Circlip
3.02	Rotor	3.05	Shim	3.08	Allen screw
3.03	Flange	3.06	Shim	3.09	Spring washer



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