COMBINORM **TYPE C**

INSTRUCTIONS FOR USE | **INSTALLATION**

Translation of the original manual
Document 20318616 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

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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 coding for cable cross-sections
B2B	Business-to-business
DC	DC current or voltage
DIN	German Institute 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
Manufacturer	The manufacturer is KEB unless otherwise specified (e.g. as a manufacturer of machines, motors, vehicles or adhesives).
IEC	International standard
IP xx	Degree of protection (xx for level)
KEB product	The KEB product is the product which is subject of this manual.
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).
MCM	American measuring unit for large cable cross-sections
MTTF	Mean service life to failure
NN	Sea level
PE	Protective earth
PELV	Safe protective low voltage, earthed
SELV	Safety extra-low voltage, unearthed (<60V)

List of standards

VDE 0580	Electromagnetic Devices and Components
DGUV Regulation 3	Electrical systems and equipment
DIN 46228-1	Wire-end ferrules; Tubular end-sleeves without plastic sleeve
DIN 46228-4	Wire-end ferrules; Tubular end-sleeves with plastic sleeve
DIN IEC 60364-5-54	Low-voltage electrical installations - Part 5-54: Selection and installation of electrical equipment - Earthing systems, protective conductors and protective bonding conductors (IEC 64/1610/CD)
EN 60204-1	Safety of machinery - Electrical equipment of machines Part 1: General requirements (VDE 0113-1, IEC 44/709/CDV)
EN 60529	Degrees of protection provided by enclosures (IP code) (VDE 0470, 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 3-1: 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: Transport (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 than 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; German version EN 50347
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, Shallow Pattern
DIN 332-2	Center holes 60° with thread for shaft ends for rotating electrical machines
DIN EN ISO 4029	Hexagon socket set screws with cup point (ISO 4029:2003); German version EN ISO 4029:2003

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 (e.g. *DGUV Regulation 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.

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.

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 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.

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.

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.

2 Product description

The COMBINORM type C coupling is a switchable, friction-locked shaft connection in mechanical engineering that enables controlled connection and disconnection of functional parts in a particularly simple manner.

2.1 Intended use

The operational reliability of the coupling is only guaranteed when used according to specified application.

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.

Technical data and information for connection conditions shall be taken from the nameplate or the magnetisation and the instructions for use and must be strictly observed. Any use beyond the technical specifications is also considered as not specified.

The actual use and application of the coupling in the target products is beyond the control of KEB Automation KG and is therefore the sole responsibility of the operator.

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

2.3 Improper use

Improper use exists, if

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

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

2.4 Type code

The type designation and version can be found on the nameplate or the marking.

x x 0 3 x x x - x x x x

Variant	Customer versions
Version	**Flange-mounted couplings with round magnetic flange**
	110: Armature element in standard design
	130: Armature element with external hub
	Shaft-mounted, friction bearing coupling with torque arm
	610: Armature element in standard design, size 01 to 07
	630: Armature element with external hub, size 01 to 07
	640: Armature element, size 01 to 07
	Shaft-mounted, ball bearing coupling with torque arm
	710: Armature element in standard design, size 08 to 12
	730: Armature element with external hub, size 08 to 12
	Shaft-mounted, ball bearing coupling with round magnet flange
	210: Armature element in standard design, size 06 and 07
	230: Armature element with external hub, size 06 and 07
	Shaft-mounted, ball bearing coupling with bearing retainer for the output, armature element in standard design
	810: Round magnet flange, size 06 and 07
	810: Torque arm, size 08 to 12
Series	COMBINORM Type C
Size	01…12

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 coupling. 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

Magnet designation can be taken from the signing.

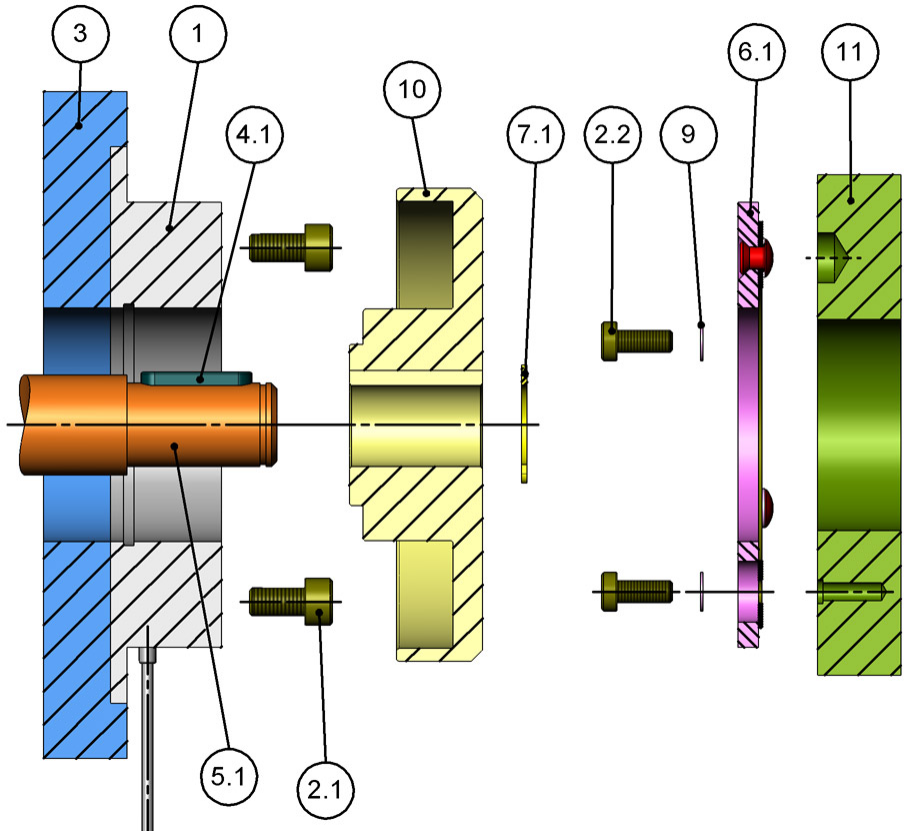
x x	0 3	x x x	-	x	x	x	x		
								Strands	Material and length
								Voltage	e.g. DC 24 V
								Version	100: Coupling magnet with round flange
									200: Coupling magnet with round flange, mounted, size 06 and 07
									300: Coupling magnet with torque arm, mounted
								Type	COMBINORM Type C
								Size	01…12

Table 2: Type code magnet

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

2.6 Overview COMBINORM Type C

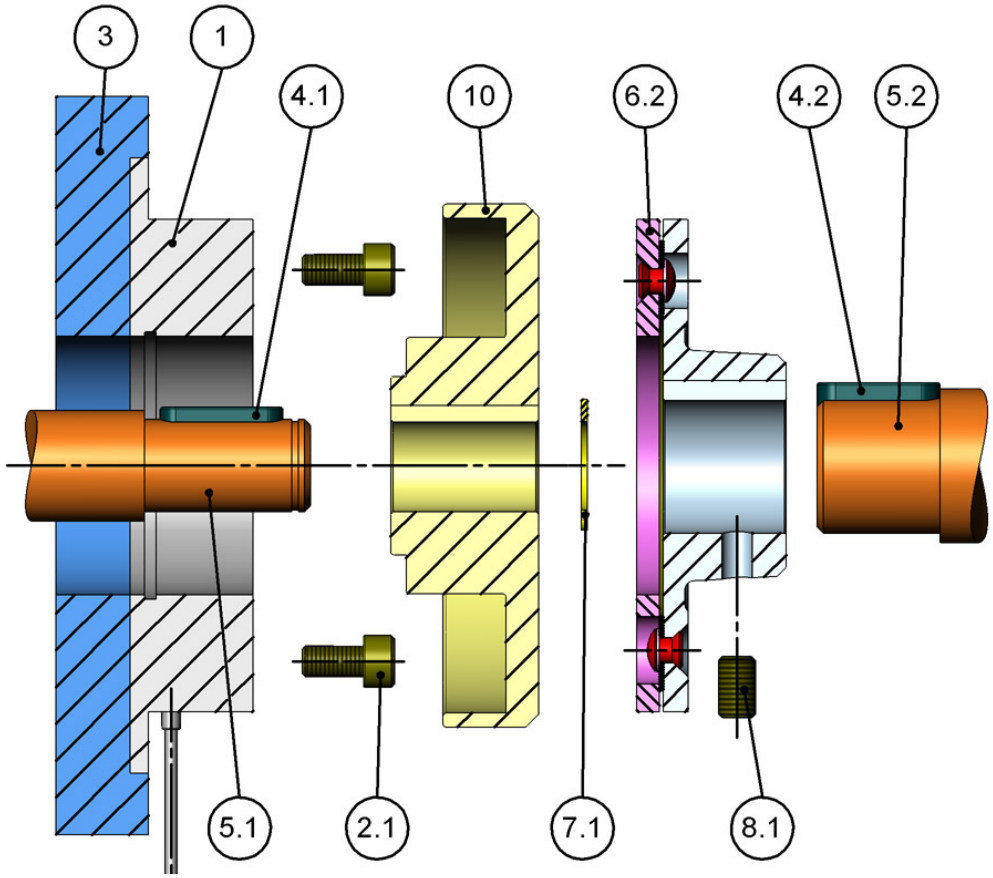
2.6.1 Version 110 - Flange mounted, armature element in standard design



Legend	
1	Magnet
2.1	Socket screws (e.g. *ISO 4762*)
2.2	Socket screws (e.g. *ISO 6912*)
3	Mounting surface (e.g. motor)
4.1	Feather key for shaft
5.1	Shaft
6.1	Armature element without hub
7.1	Locking ring
9	Schnorr-lock washers
10	Rotor
11	Mounting surface evaluated by the customer (e.g. belt pulley, pinion etc.)

Figure 1: Version 110 - Flange mounted, armature element in standard design

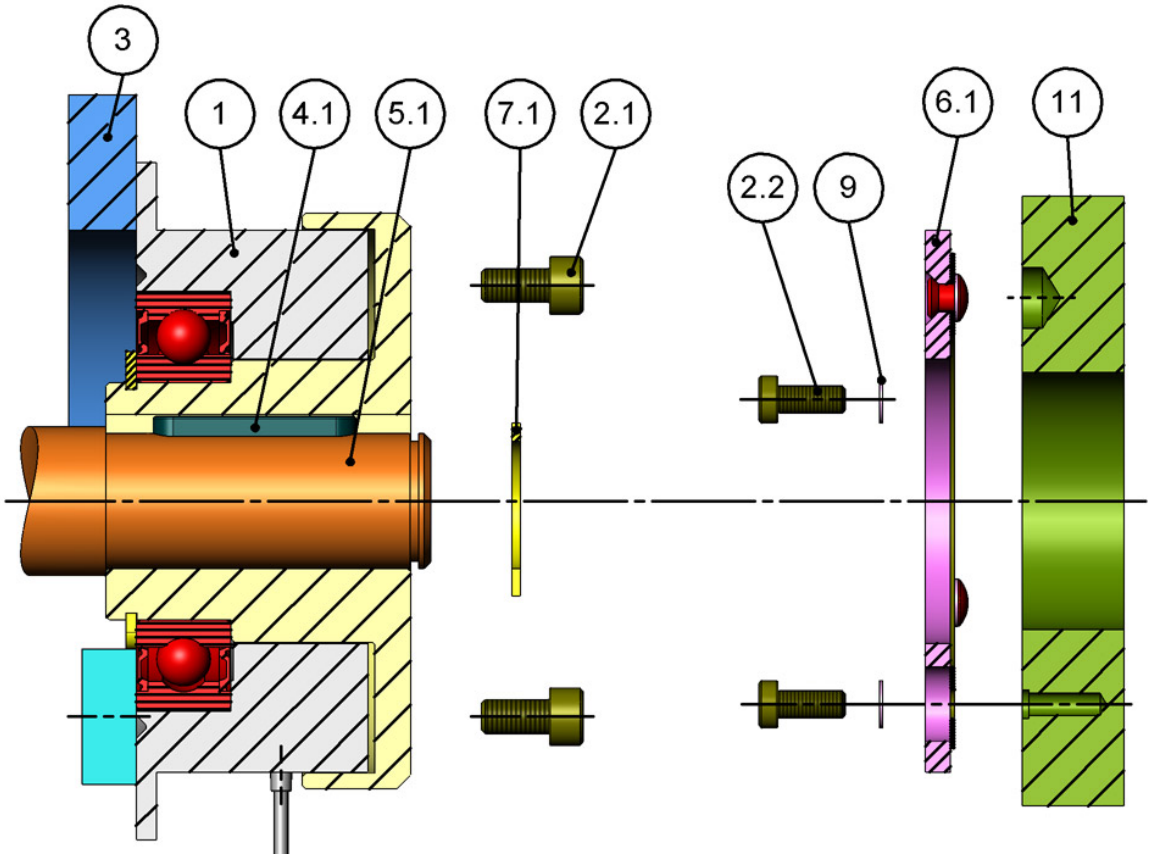
2.6.2 Version 130 - Flange mounted, armature element with external hub



Legend	
1	Magnet
2.1	Socket screws (e.g. *ISO 4762*)
3	Mounting surface (e.g. motor)
4.1 / 4.2	Feather key for shaft
5.1 / 5.2	Shaft
6.2	Armature element - hub neck outside
7.1	Locking ring
8.1	Threaded pin
10	Rotor

Figure 2: Version 130 - Flange mounted, armature element with external hub

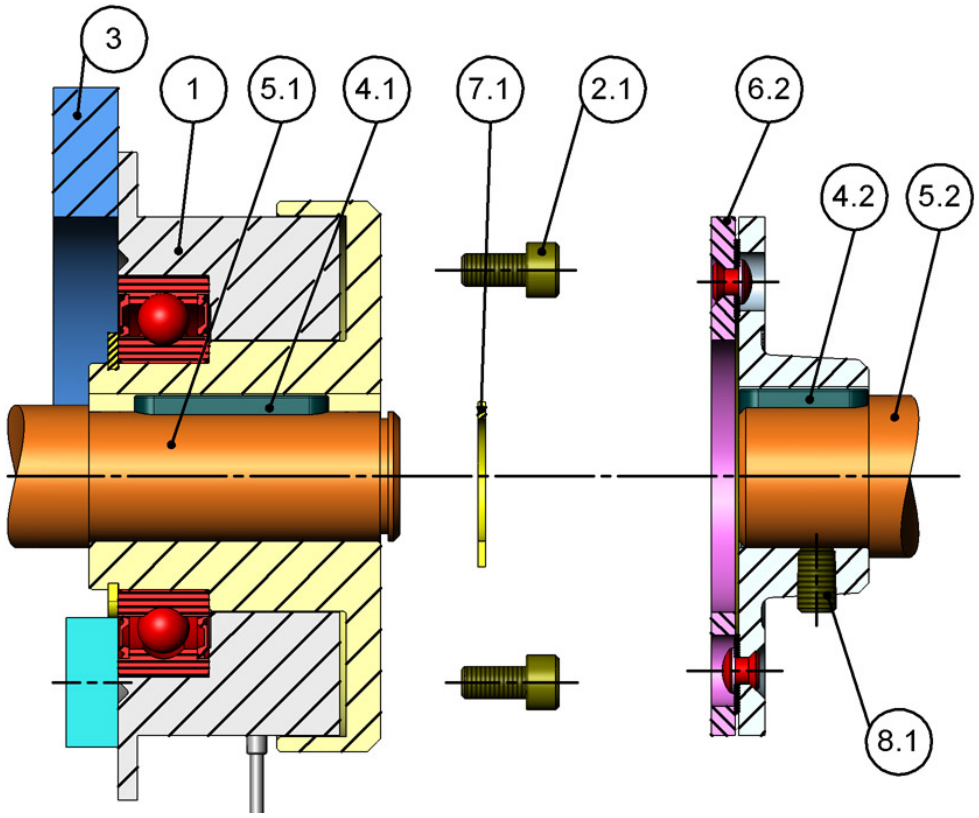
2.6.3 Version 210 - Shaft-mounted with flange and armature element without hub



Legend	
1	Magnet with mounted rotor
2.1	Socket screws (e.g. *ISO 4762*)
2.2	Socket screws (e.g. *ISO 6912*)
3	Mounting surface (e.g. motor, torque arm)
4.1	Feather key for shaft
5.1	Shaft
6.1	Armature element without hub
7.1	Locking ring
9	Schnorr-lock washers
11	Mounting surface evaluated by the customer (e.g. belt pulley, pinion etc.)

Figure 3: Version 210 - Shaft-mounted with flange and armature element without hub

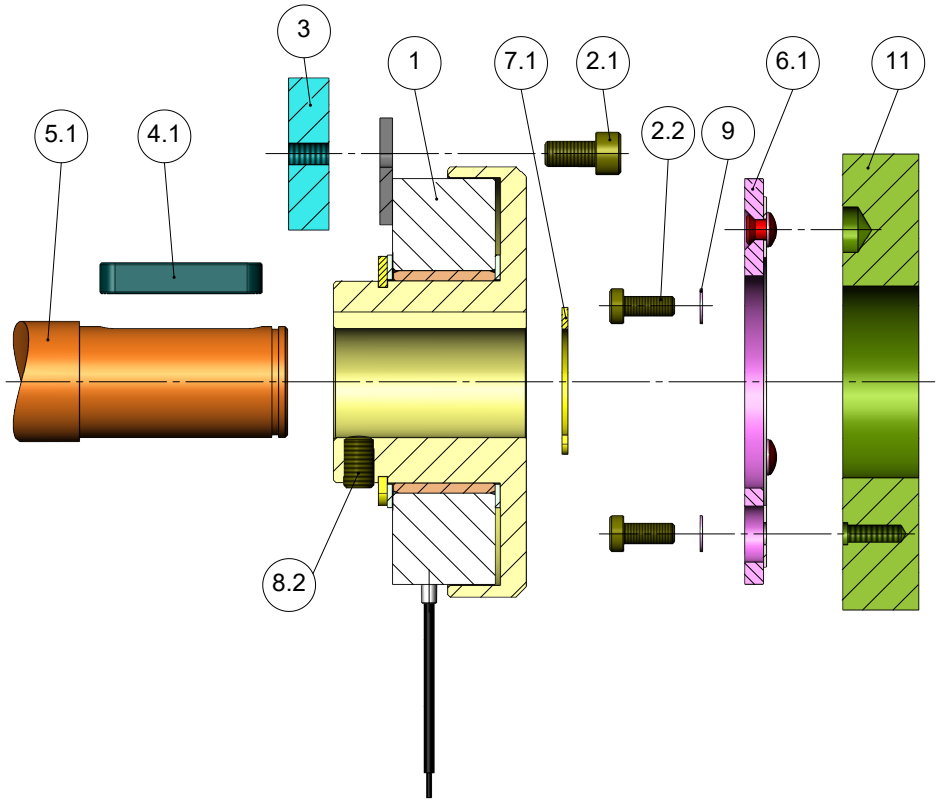
2.6.4 Version 230 - Shaft-mounted with flange and armature element with hub



Legend	
1	Magnet with mounted rotor
2.1	Socket screws (e.g. *ISO 4762*)
3	Mounting surface (e.g. motor, torque arm)
4.1 / 4.2	Feather key for shaft
5.1 / 5.2	Shaft
6.2	Armature element - hub neck outside
7.1	Locking ring
8.1	Threaded pin

Figure 4: Version 230 - Shaft-mounted with flange and armature element with hub

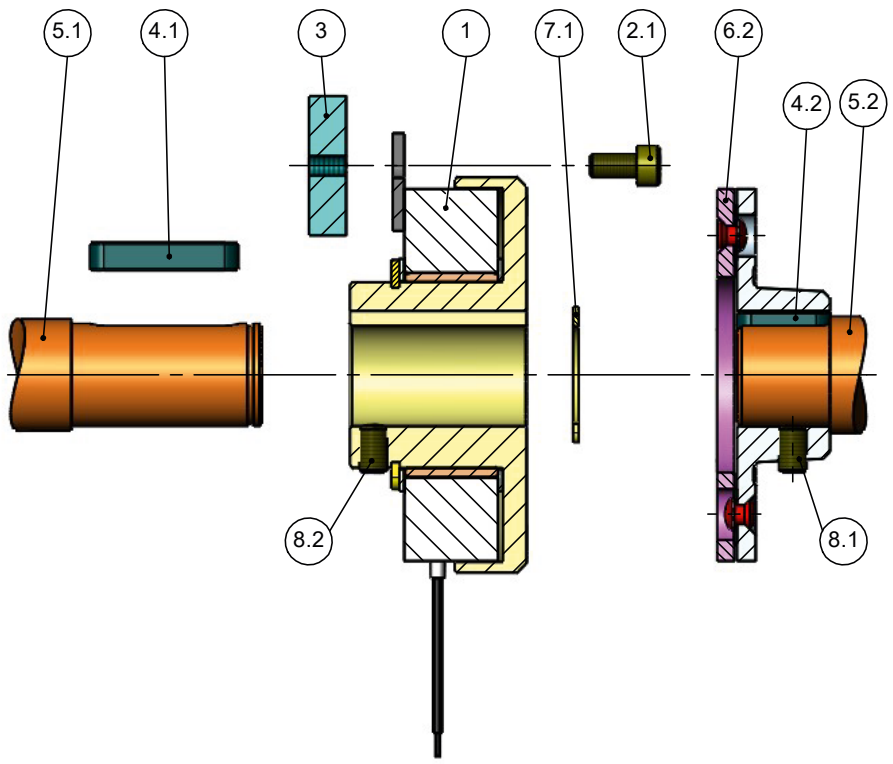
2.6.5 Version 610 - Flange mounted, armature element in standard design, size 01 to 07



Legend	
1	Magnet with mounted rotor
2.1	Socket screws (e.g. *ISO 4762*)
2.2	Socket screws (e.g. *ISO 6912*)
3	Mounting surface (e.g. motor, torque arm)
4.1	Feather key for shaft
5.1	Shaft
6.1	Armature element without hub
7.1	Locking ring
8.2	Threaded pin
9	Schnorr-lock washers
11	Mounting surface evaluated by the customer (e.g. belt pulley, pinion etc.)

Figure 5: Version 610 - Flange mounted, armature element in standard design, size 01 to 07

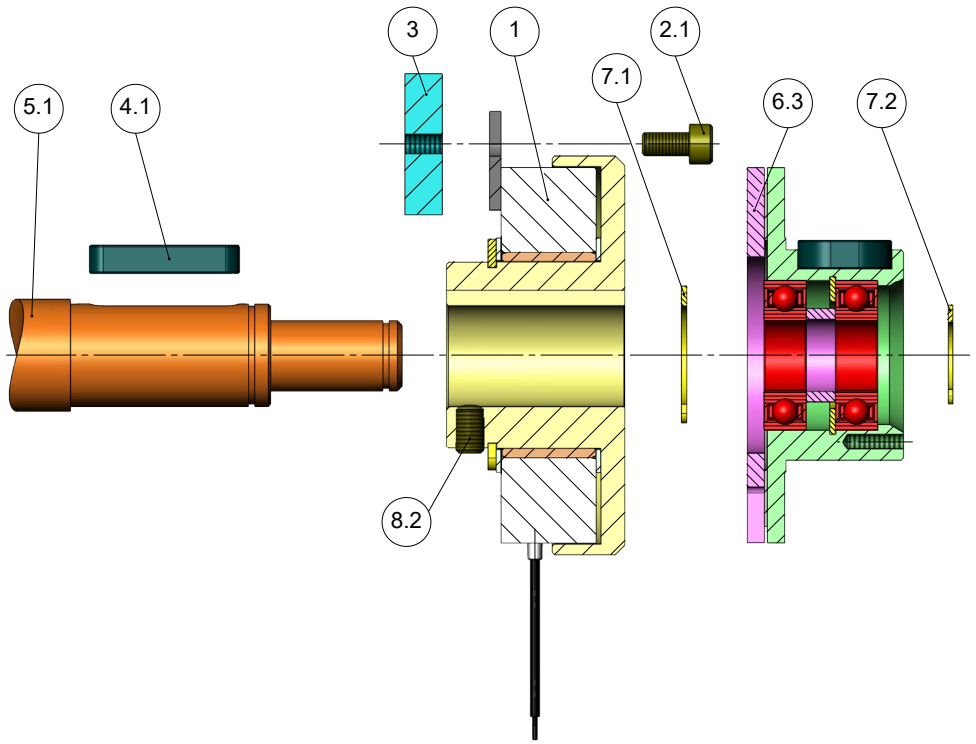
2.6.6 Version 630 - Armature element with external hub, size 01 to 07



Legend	
1	Magnet with mounted rotor
2.1	Socket screws (e.g. *ISO 4762*)
3	Mounting surface (e.g. motor, torque arm)
4.1 / 4.2	Feather key for shaft
5.1 / 5.2	Shaft
6.2	Armature element - hub neck outside (mounted)
7.1	Locking ring
8.1 / 8.2	Threaded pin

Figure 6: Version 630 - Armature element with external hub, size 01 to 07

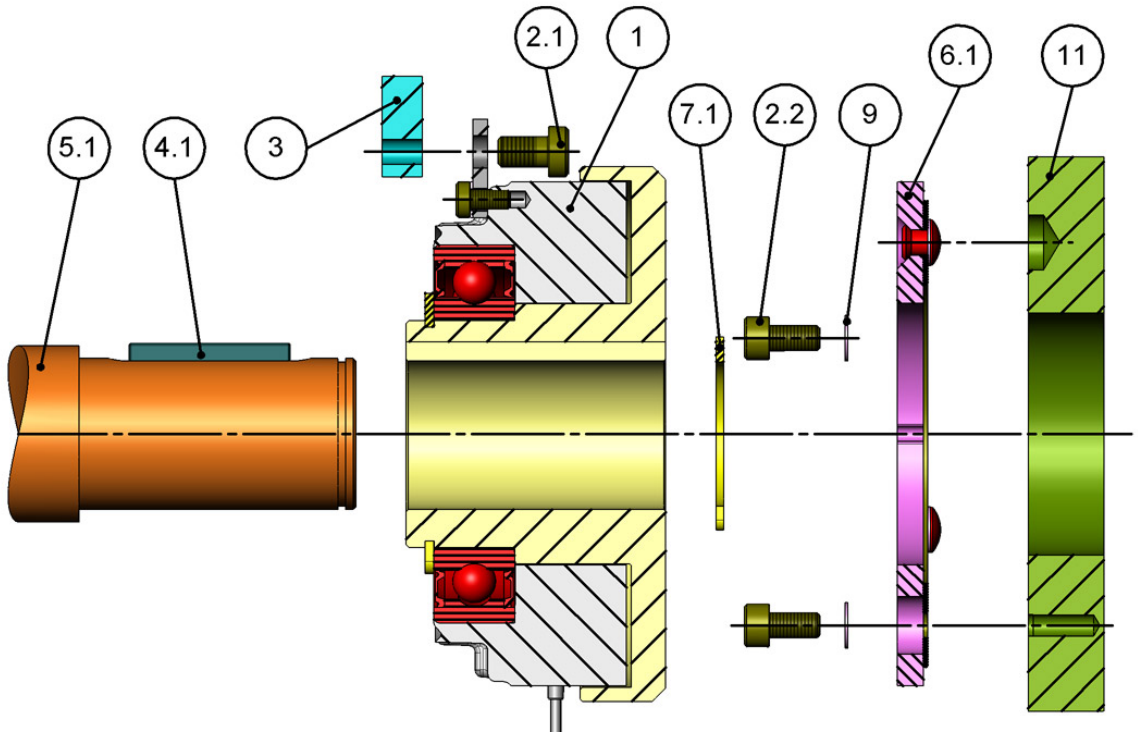
2.6.7 Version 640 - Flange mounted, armature element mounted, size 01 to 07



Legend	
1	Magnet with mounted rotor
2.1	Socket screws (e.g. *ISO 4762*)
3	Mounting surface (e.g. motor, torque arm)
4.1	Feather key for shaft
5.1	Shaft
6.3	Armature element - hub neck outside (mounted)
7.1 / 7.2	Locking ring
8.2	Threaded pin

Figure 7: Version 640 - Flange mounted, armature element mounted, size 01 to 07

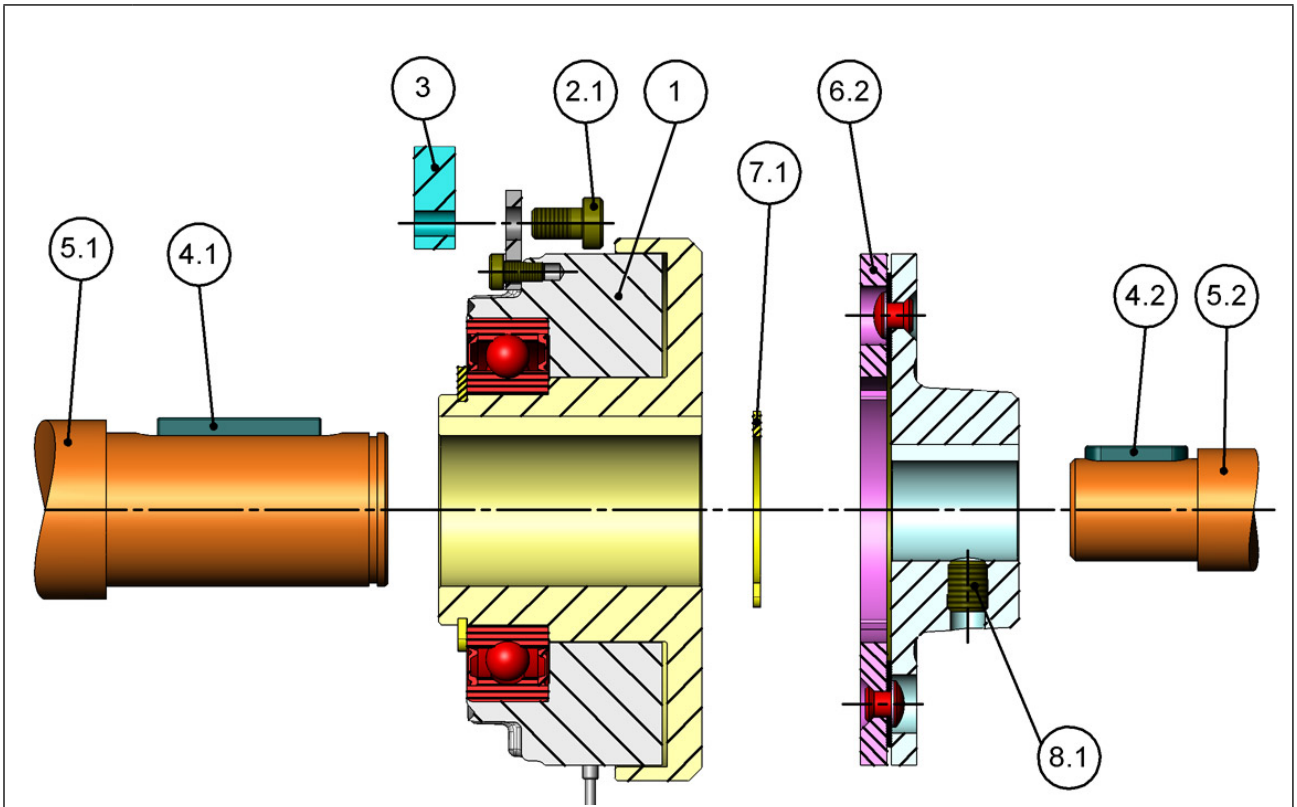
2.6.8 Version 710 - Shaft-mounted, armature element in standard design, size 08 to 12



Legend	
1	Magnet with mounted rotor
2.1	Socket screws (e.g. *ISO 4762)*
2.2	Socket screws (e.g. *ISO 6912*)
3	Screw-on surface for torque arm
4.1	Feather key for shaft
5.1	Shaft
6.1	Armature element without hub
7.1	Locking ring
9	Schnorr-lock washers
11	Mounting surface evaluated by the customer (e.g. belt pulley, pinion etc.)

Figure 8: Version 710 - Shaft-mounted, armature element in standard design, size 08 to 12

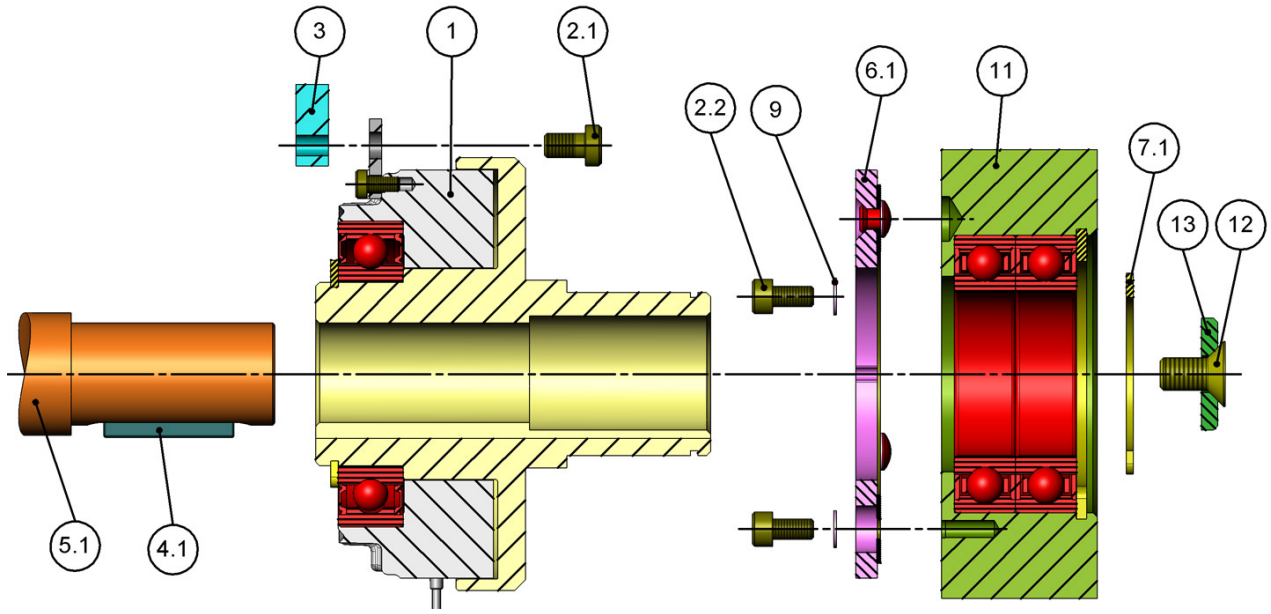
2.6.9 Version 730 - Shaft-mounted, armature element with external hub, size 08 to 12



Legend	
1	Magnet with mounted rotor
2.1	Socket screws (e.g. *ISO 4762)*
3	Screw-on surface for torque arm
4.1 / 4.2	Feather key for shaft
5.1 / 5.2	Shaft
6.2	Armature element - hub neck outside
7.1	Locking ring
8.1	Threaded pin

Figure 9: Version 730 - Shaft-mounted, armature element with external hub, size 08 to 12

2.6.10 Version 810 - Shaft-mounted, armature element in standard design



Legend	
1	Magnet with mounted rotor
2.1	Socket screws (e.g. *ISO 4762)*
2.2	Socket screws (e.g. *ISO 6912*)
3	Screw-on surface for torque arm
4.1	Feather key for shaft
5.1	Shaft
6.1	Armature element without hub
7.1	Locking ring
9	Schnorr-lock washers
11	Mounting surface evaluated by the customer (e.g. belt pulley, pinion etc.)
12	Counter-sunk screw
13	Shaft-end disc

Figure 10: Version 810 - Shaft-mounted, armature element in standard design

2.7 Functional description

The COMBINORM type C is a single-surface coupling for dry running.

When energised, the force of a magnetic field is used to build up a frictional torque. The armature disk is attracted to the rotor and the torque is transmitted by a diaphragm spring without torsional backlash and without wear.

After switching off the rated voltage, the friction surfaces are separated without residual torque, independent of the mounting orientation, in conjunction with the diaphragm spring on the armature element.

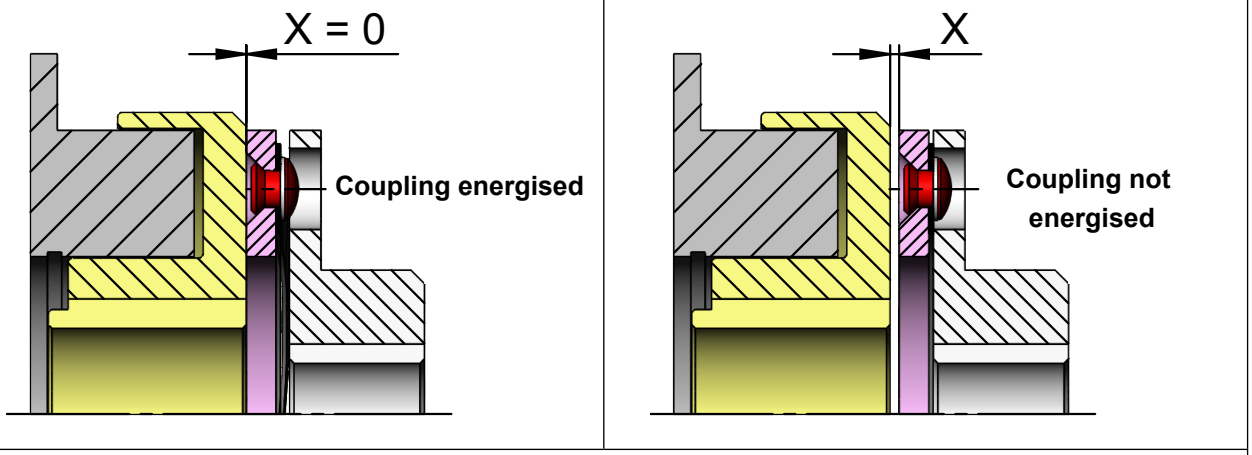


Figure 11: Functional description

3 Technical data

3.1 Operating conditions

3.1.1 Climatic environmental conditions

Operation	Standard	Class	Notes
Ambient temperature	*VDE 0580*	–	-5...35 °C
Construction and degree of protection	*EN 60529*	IP40	Standard
Table 3: Climatic environmental conditions			

3.1.2 Electrical operating conditions

3.1.2.1 Device classification

Requirement	Standard	Class	Notes
Overvoltage category	*EN 60664-1*	III	–
Table 4: Device classification			

3.2 Device data COMBINORM Type C

Device size			01	02	03	05	06	07	08	09	10	11	12
Characteristic torque after inlet at 20 °C	[1]	M_2 / Nm	0.5	0.75	1.5	3	7	15	30	65	130	250	500
Rated power		P_{20} / W	6	6	8	10	15	20	28	35	50	68	85
Rated voltage	[2]	U_{N_dc} / V	6...205										
Operating voltage range		U_{A_dc} / V	U_{N_dc} ±10 %										
Cyclic duration factor		ED / %	100										
Friction work	[3]	W_{R_max} / 10^4J	0.04	0.05	0.08	0.12	0.19	0.31	0.48	0.75	1.25	2	2.9
		$W_{R\_0.1mm}$ / 10^7J	0.23	0.3	0.43	0.63	0.95	1.63	2.53	4.09	6.66	10.4	16.3
		P_{R_max} / J/s	20.3	28.6	40.6	58.3	80.6	114	161	228	322	458	647
Max. operating speed	[4]	$n_{\_max}$ / rpm	15,000				12,000	10,000	8,000	6,500	5,000		3,000
Max. operating speed 210/230/710/730/810	[4] [5]	$n_{\_max}$ / rpm	–				8,000	7,000	5,300	5,000	3,600		3,000
Max. brake speed	[4]	n_{B_max} / rpm	10,000				8,000	6,000	5,000	4,000	3,000		2,000
Mass moment of inertia armature element 110/210/610/710/810		J / 10^{-4}kgm²	0.010	0.014	0.045	0.122	0.366	1.07	3.72	10.6	40	115	311
Mass moment of inertia armature element 130/230/630/730		J / 10^{-4}kgm²	0.013	0.021	0.068	0.18	0.53	1.57	5.29	15.1	50.1	159	437
Rotor 110/130/610/630/640		J / 10^{-4}kgm²	0.025	0.035	0.15	0.375	0.825	2.38	7.25	21.9	67.4	200	450
Rotor 210/230/710/730		J / 10^{-4}kgm²	0.027	0.038	0.17	0.4	0.9	2.6	8	24	73	220	500
Rotor 810		J / 10^{-4}kgm²	–	–	–	–	1.02	3.05	8.76	26	82.5	230	520
Nominal air gap		X / mm	0.1	0.15	0.15	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4
Separation time	[6]	t_{2_dc} / ms	≤ 8	≤ 10	≤ 12	≤ 20	≤ 30	≤ 40	≤ 50	≤ 70	≤ 120	[9]	
		t_{2_ac} / ms	≤ 30	≤ 40	≤ 50	≤ 100	≤ 130	≤ 150	≤ 200	≤ 300	≤ 500	[9]	
Response delay DC	[7]	t_{11_dc} / ms	≤ 12	≤ 15	≤ 18	≤ 20	≤ 25	≤ 30	≤ 35	≤ 40	≤ 45	[9]	
Linking time DC	[8]	t_{1_dc} / ms	≤ 35	≤ 45	≤ 50	≤ 70	≤ 90	≤ 120	≤ 150	≤ 180	≤ 250	[9]	
Feather key			according to *DIN 6885-1*										
Keyway			according to *DIN 6885-1*										
ISO class			B										

Table 5: Device data COMBINORM Type C

[1] *The torques are based on a quasi-static measurement with a differential speed of 25 rpm.*

[2] *Special voltage upon request.*

[3] *W_{R_max} = permissible friction work per switching cycle; $W_{R\_0.1mm}$ = friction work up to 0.1mm abrasion; P_{R_max} = permissible friction work per second.*

[4] *Plain bearing couplings have a maximum operating speed of $n_{\_max}$ = 1,500* rpm.

[5] *Plain bearing versions.*

[6] *Time from switching off the current to reach 0.1 M_2.*

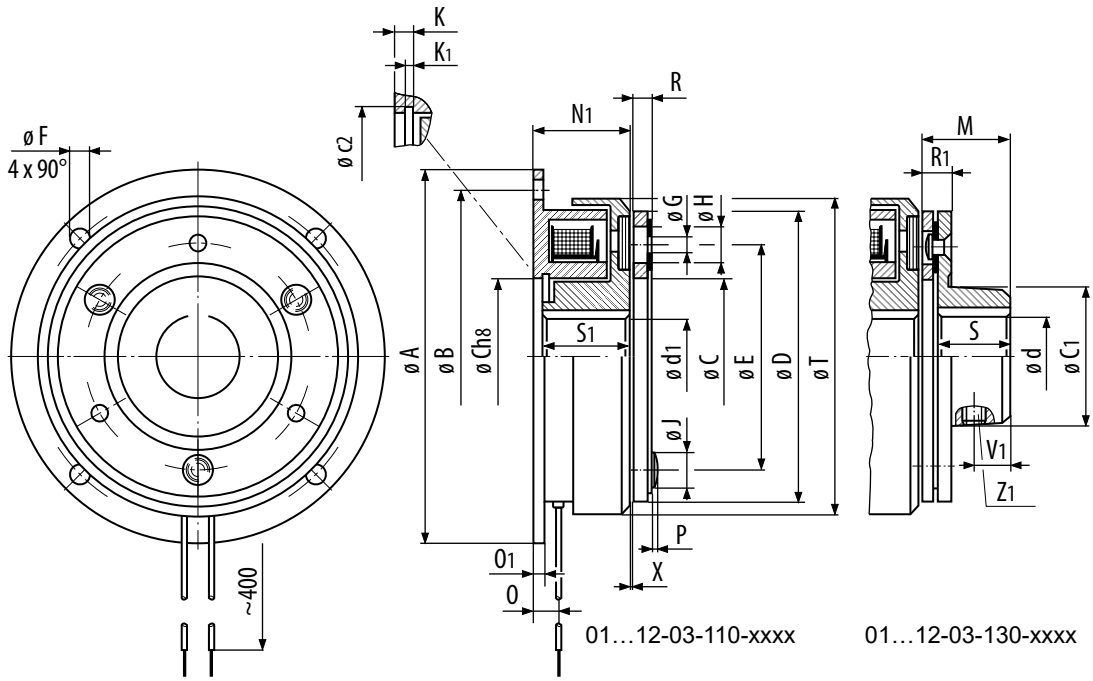
[7] *Time from switching on the current to the increase of the torque.*

[8] *Time from switching on the current to reach 0.9 x M_2.*

[9] *Values available upon request.*

3.3 Dimensions and weights

3.3.1 Flange-mounted coupling

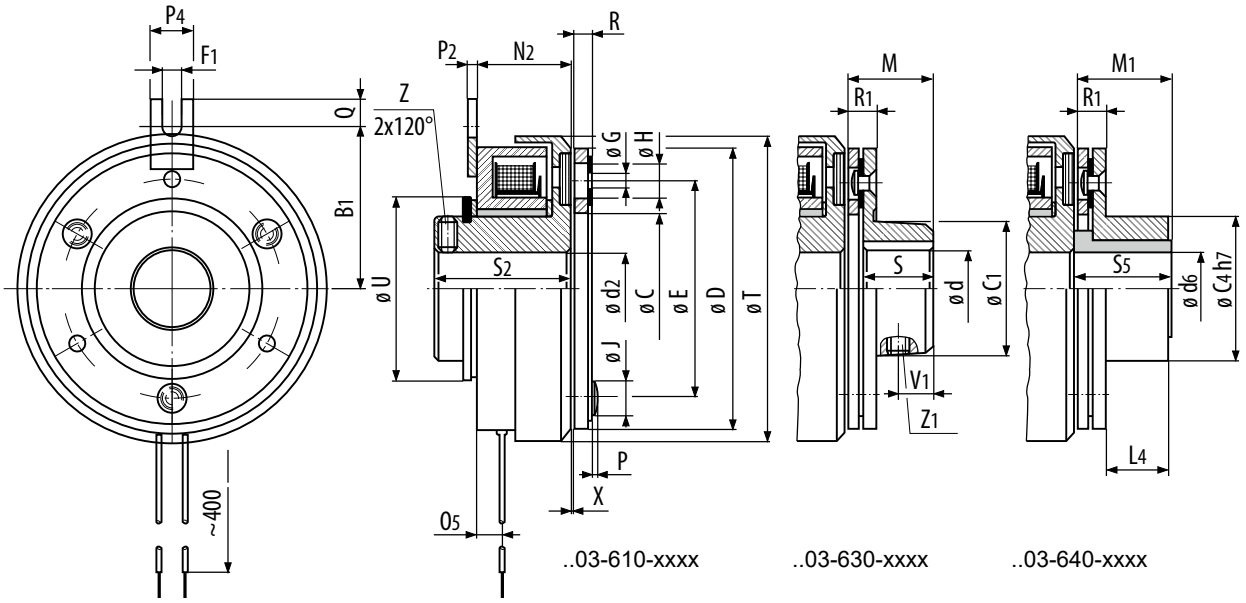


Dimensions / mm	Size										
	01	02	03	05	06	07	08	09	10	11	12
A	39	45	54	65	80	100	125	150	190	230	290
B	33.5	38	47	58	72	90	112	137	175	215	270
C_{h8}	11	13	19	26	35	42	52	62	80	100	125
C_1	13.5	16	22	24	32	38	48	58	73	92	112
C_2	-	13.6	20	27	36	43.5	53.8	63.8	82.1	102.1	127.4
D	28	32	40	50	63	80	100	125	160	200	250
E	19.5	23	30	38	50	60	76	95	120	158	210
K	-	3	3	3.2	3.5	4.25	5	5.5	6	7	8
K_1	-	1.1	1.1	1.3	1.6	1.85	2.15	2.15	2.65	3.15	4.15
M	9.3	12.1	14.7	15	18.8	24.3	31	36.9	46.9	59.2	68
N_1	18	22.2	25.4	28.1	24	26.5	30	33.5	37.5	44	51
R	2.3	2.1	2.7	3	3.8	4.3	6	6.9	8.9	11.2	13
R_1	4.3	4.1	5.3	6	7.3	8.3	11	12.9	15.9	20.2	24
S	7	10	12	12	15	20	25	30	38	48	55
S_1	16.5	20.2	23.4	26.1	22	24	27	30	34	40	47
T	31	34	43	54	67	85	106	133	169	212.5	266
X	0.1	0.15	0.15	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4
D	6	8	10	15	18	22	30	35	45	60	70
d_1	6	8	10	15	20	25	30	35	50	65	80
Weight / kg ..03 110....	0.1	0.1	0.2	0.35	0.5	0.9	1.6	2.8	5.6	9.7	17.9
..03 130....	0.1	0.1	0.2	0.4	0.5	1	1.8	3.1	6.3	11	20.3

Keyway according to *DIN 6885-1* P9.

Abbildung 12: Dimensions COMBINORM type C flange-mounted coupling

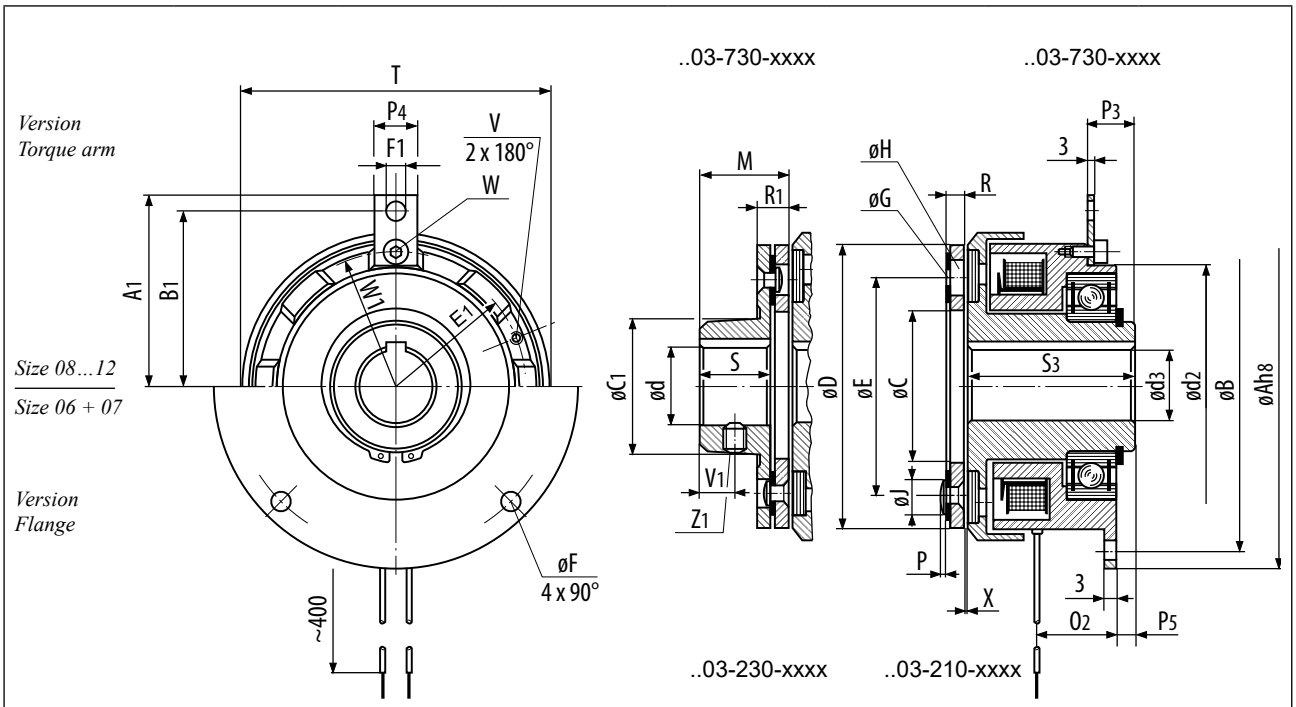
3.3.2 Shaft-mounted coupling size 01...07



Dimensions / mm	Size					
	01	**02**	**03**	**05**	**06**	**07**
B_1	16.8	20	23	28	36	45
C	11	13	19	26	35	42
C_1	13.5	16	22	24	32	38
$C_{4\ h7}$	13	14	18	28	-	-
D	28	32	40	50	63	80
E	19.5	23	30	38	50	60
F_1	3.1	3.1	3.1	3.1	5.2	5.2
L_4	4.8	7.8	9.1	8.8	-	-
M	9.3	12.1	14.7	15	18.8	24.3
M_1	9.3	12.1	14.7	15	-	-
N_2	17.3	19.8	23	26.1	24	26.5
P_4	8	8	8	8	12	12
Q	3	3	3	3	7	7
R	2.3	2.1	2.7	3	3.8	4.3
R_1	4.3	4.1	5.3	6	7.3	8.3
S	7	10	12	12	15	20
S_2	23.5	26.2	30.4	34.1	33	38
S_5	9.4	12.25	14.85	15.2	-	-
T	31	34	43	54	67	85
U	17	21	23	32	41	50
X	0.1	0.15	0.15	0.2	0.2	0.2
D	6	8	10	15	18	22
d_2	6	6	10	17	20	25
d_6	6	6	10	15	-	-
Weight / kg ..03 610....	0.1	0.1	0.2	0.35	0.5	0.9
..03 630....	0.1	0.1	0.2	0.4	0.5	1

Abbildung 13: Dimensions COMBINORM Type C shaft-mounted coupling size 01…07

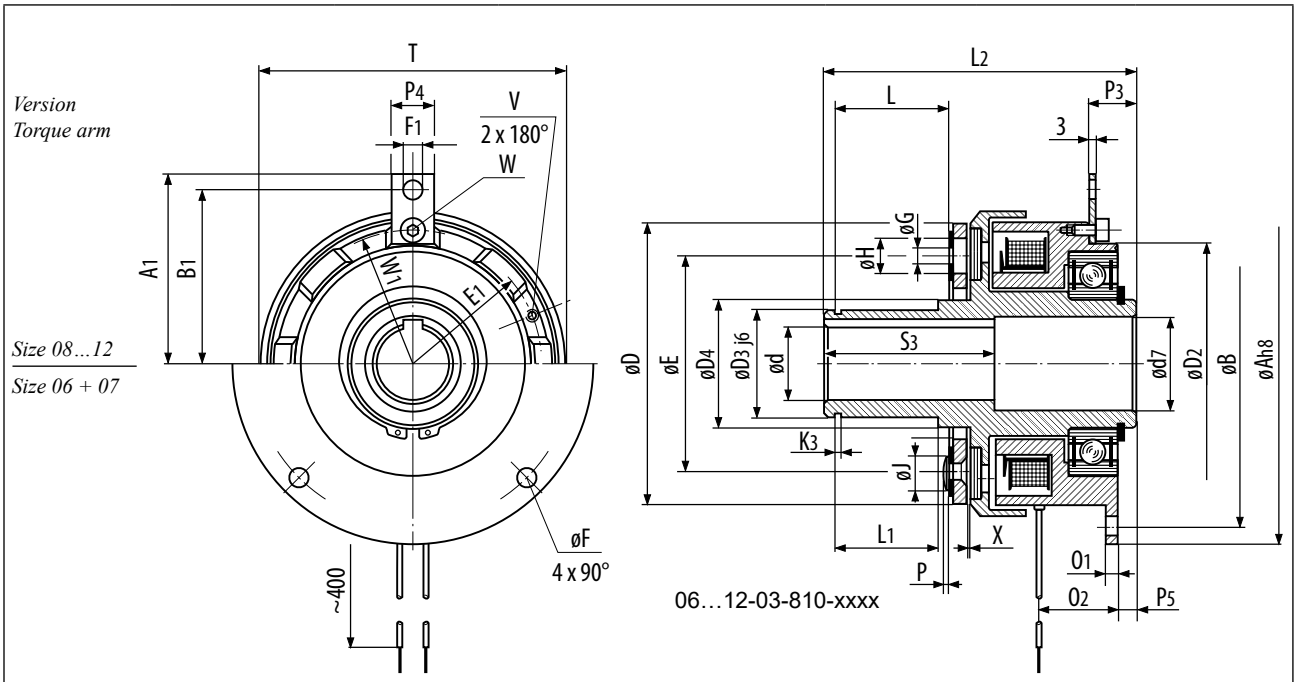
3.3.3 Shaft-mounted coupling size 06...12



Dimensions / mm	Size						
	06	07	08	09	10	11	12
A_{h8}	80	100	-	-	-	-	upon request
A_1	-	-	62.5	75	95	115	
B	72	90	-	-	-	-	
B_1	-	-	56	68.5	87.5	107.5	
C	35	42	52	62	80	100	
C_1	32	38	48	58	73	92	
D	63	80	100	125	160	200	
D_2	-	-	85	95	126	126	
E	50	60	76	95	120	158	
E_1	-	-	45.75	55	72.5	88	
F_1	-	-	6.5	6.5	9	9	
M	18.8	24.3	31	36.9	46.9	59.15	
P_3	-	-	16.2	18.7	21.5	23	
R_1	7.3	8.3	11	12.9	15.9	20.15	
S	15	20	25	30	38	48	
S_3	41	45	51.5	55	65	71	
T	67	85	106	133	169	212.5	
W_1	-	-	46.5	55	72.5	88	
X	0.2	0.2	0.2	0.3	0.3	0.4	
D	18	22	30	35	45	60	
d_3	17	22	30	35	50	50	
Weight / kg ..03 210/710	0.8	1.5	2.3	3.7	7	13.1	
..03 230/730	0.9	1.6	2.5	4.1	7.7	14.3	

Abbildung 14: Dimensions COMBINORM Type C shaft-mounted coupling 06…12

3.3.4 Shaft-mounted coupling with bearing retainer for the output



Dimensions / mm	Size						
	06	07	08	09	10	11	12
A_{h8}	80	100	-	-	-	-	*upon request*
A_1	-	-	62.5	75	95	115	
B	72	90	-	-	-	-	
B_1	-	-	56	68.5	87.5	107.5	
D	63	80	100	125	160	200	
D_2	-	-	85	95	126	126	
$D_{3\ j6}$	25	35	40	50	70	70	
D_4	29	40	46	57	76	76	
E	50	60	76	95	120	158	
E_1	-	-	45.75	55	72.5	88	
F_1	-	-	6.5	6.5	9	9	
K_3	1.3	1.6	1.85	2.15	2.65	2.65	
L	32.9	37.7	35.2	37.6	47.8	47.5	
L_1	25.6	29.9	32.15	34.6	43.1	43.3	
L_2	80	90	96	103	126	134	
P_3	-	-	16.2	18.7	21.5	23	
P_4	-	-	12	14	14	20	
P_5	4	4.5	5.5	5.5	7	7	
S_3	41	45	51.5	55	65	82	
T	67	85	106	133	169	212.5	
X	0.2	0.2	0.2	0.3	0.3	0.4	
D	16	22	25	35	50	50	
d_7	17	25	28.5	33	41	48	
Weight / kg ..03 810....	1	1.8	2.7	4.2	8.3	14.5	

Abbildung 15: Dimensions COMBINORM Type C shaft-mounted coupling with bearing retainer for the output

4 Mounting

4.1 Notes on mounting

Checks before mounting the coupling

Before mounting the coupling, check the following:

- ► Compliance of the ordered voltage and performance data with the type plate data or magnetic marking.
- ► No damage to the coupling or contamination by foreign particles in the area of operation or in the air gap of the coupling.
- ► The friction surfaces must be free from grease and oil.
- ► Air humidity, aggressive vapours/liquids or similar may lead to corrosion and cause the lining to stick. In this case, the user needs to provide appropriate measures!
- ► The coupling must 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“*).

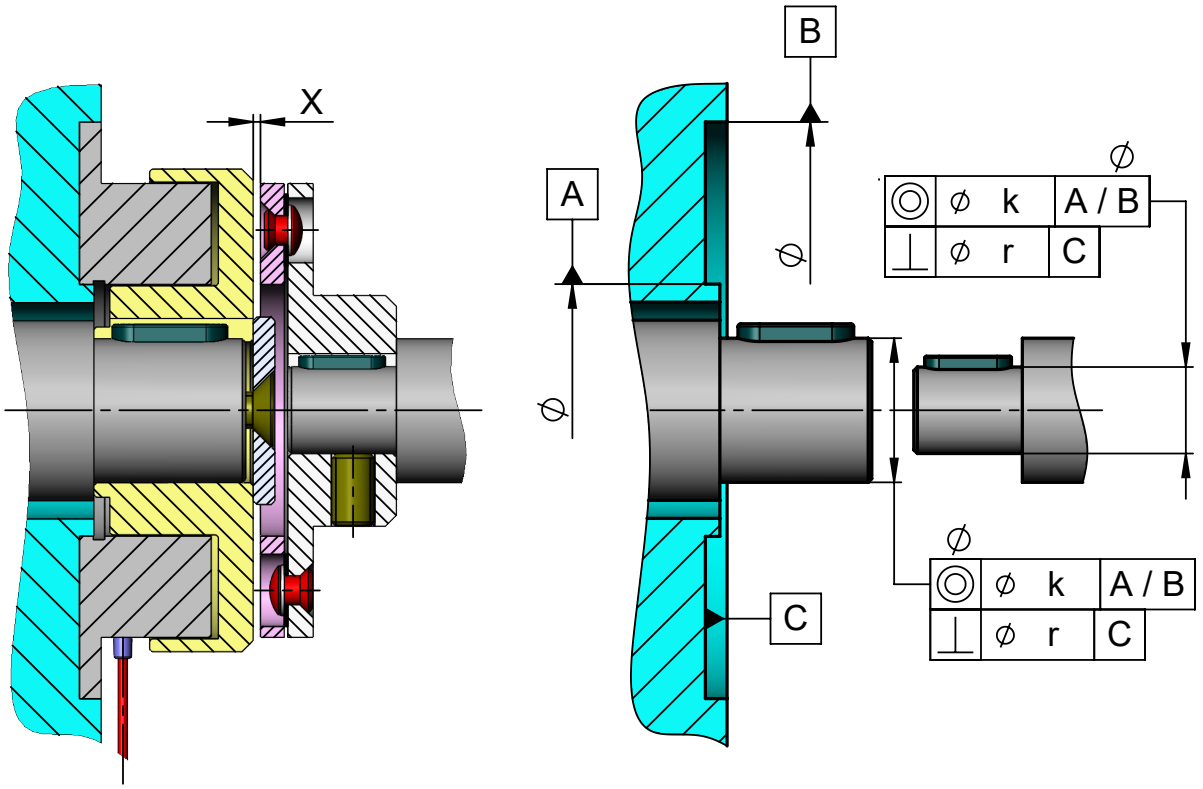
Observe during mounting

NOTICE	**Overexpansion of the diaphragm spring.** **Damage to the coupling!** Mounting of the armature element is permitted only when the supply voltage is disconnected to avoid overexpansion of the diaphragm spring at the armature element. Magnet and armature element must be centered at mounted couplings. Axial and radial run-out deviations lead to premature failure.

During mounting, please observe the following notes/instructions:

- ► The friction surfaces of the coupling 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 coupling.
- ► The armature may not be centered at the in and outside diameter. It must be able to move free, because it must be placed through the riveted spring.
- ► 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 to the stub shaft must not exceed the following values: => *„Figure 1: Concentricity k between magnet centering and perpendicularity r shaft (armature bore)“*.

► The angular deviation of the mounting surface to the shaft must not exceed the following values (in relation to the mounting hole circle diameter): => *„Figure 1: Concentricity k between magnet centering and perpendicularity r shaft (armature bore)“*.



Legend									
1	Customer flange								
2	Magnet								
3	Armature element								
4	Customer shaft								
Size	**01**	**02**	**03**	**05**	**06**	**07**	**08**	**09**	**10**
k / mm	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3
r / mm	0.04	0.04	0.04	0.06	0.06	0.06	0.06	0.08	0.08

Figure 1: Concentricity k between magnet centering and perpendicularity r shaft (armature bore)

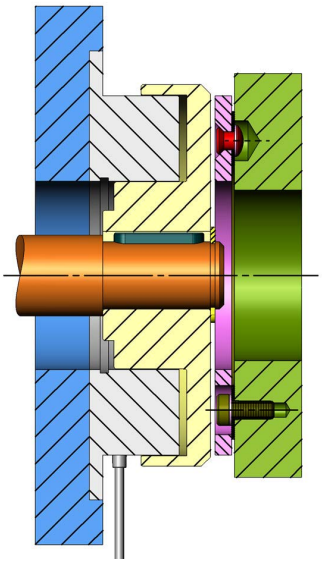
4.2 Mount the coupling

NOTICE

Damage to the coupling!

- ► Mounting of the armature element is permitted only when the supply voltage is disconnected to avoid overexpansion of the diaphragm spring at the armature element.
- ► Magnet and armature element must be centered at mounted couplings. Axial and radial run-out deviations lead to premature failure.

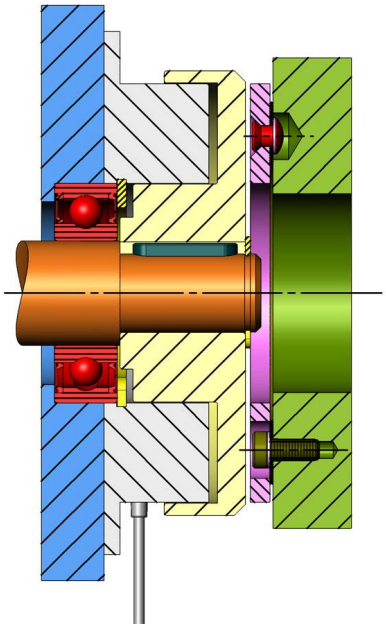
4.2.1 Mounting the magnets at flange-mounted coupling



Outside centering

(e.g. 01…12-03-110/130-xxxx)

The magnet can be centered via the outside diameter of the magnet and screwed to the mounting surface with socket head screws (e.g. DIN 4762, 8.8).



Inside centering

(e.g. 01…12-03-110/130-xxxx)

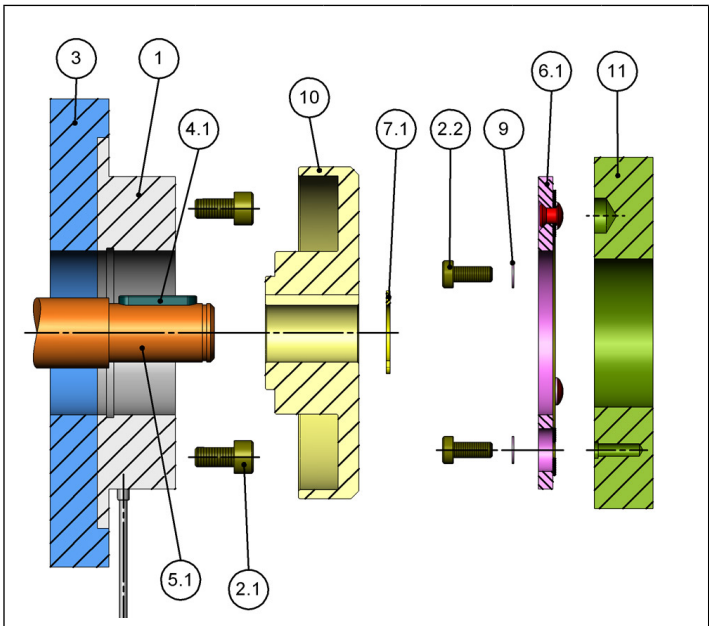
The magnet can be centered via the inside diameter of the magnet and screwed to the mounting surface with socket head screws (e.g. DIN 4762, 8.8).

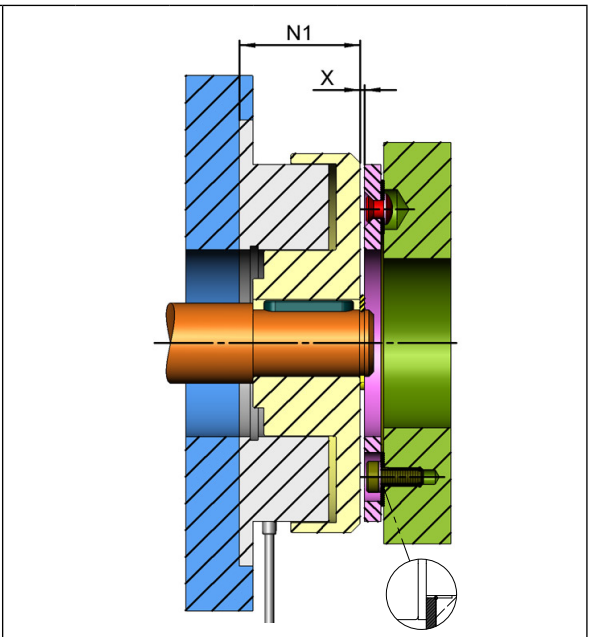
To fix the bearing axially, the locking ring must be inserted into the magnet during assembly.

Figure 2: Mounting the magnets at flange-mounted coupling

4.2.2 Assembly of flange-mounted coupling

Example 1-A: Flange-mounted coupling with armature element without hub



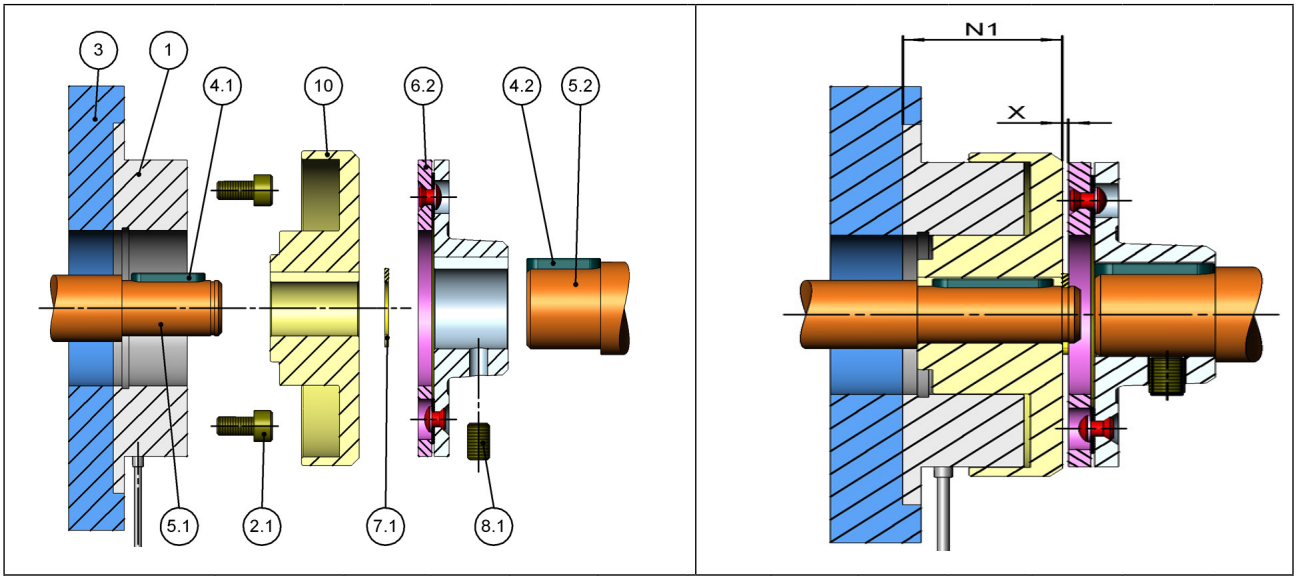


Size		01	02	03	05	06	07	08	09	10	11	12
Mounting dimension	N_1 / mm	18	22.2	25.4	28.1	24	26.5	30	33.5	37.5	44	51

Figure 3: Flange-mounted coupling with armature element without hub (e.g. 01…12-03-110-xxxx)

- ► The shaft (5.1) of the motor and the mounting surfaces (3/11) must be designed in such a way that the mounting dimension N_1 and the air gap X result automatically during installation.
- ► If necessary, the mounting dimension N_1 can be adjusted with adjusting washers between rotor (10) and shaft (5.1).
- ► Only for internal centring: Insert the locking ring into the magnet (1).
- ► Mount the feather key (4.1) into the motor shaft (5.1).
- ► Mount the magnet (1) with the socket head screws (2.1) to the mounting surface (3).
- ► Slide the rotor (10) onto the motor shaft (5.1) observe the mounting dimension N_1. Secure the rotor axially on the motor shaft (5.1) with a shaft end plate or with a locking ring (7.1).
- ► Place the armature element (6.1) against the screw mounting surface on the customer side (6) and tighten the socket head screws (2.2) lightly with the Schnorr lock washers (9).
- ► Align the armature element and tighten the socket head screws.
- ► Mount the component (11).
- ► Secure the component (11) axially.
- ► Check the air gap X. Adjust it, if necessary.

Example 1-B: Flange-mounted coupling with armature element - external hub neck



Size		01	02	03	05	06	07	08	09	10	11	12
Mounting dimension	N_1 / mm	18	22.2	25.4	28.1	24	26.5	30	33.5	37.5	44	51

Figure 4: Flange-mounted coupling with armature element - external hub neck (e.g. 01…12-03-130-xxxx)

- ► The shaft (5.1 / 5.2) of the motor and the mounting surfaces (3/11) must be designed in such a way that the mounting dimension N_1 and the air gap X result automatically during installation.
- ► If necessary, the mounting dimension N_1 can be adjusted with adjusting washers between rotor (10) and shaft (5.1).
- ► If necessary, the air gap X can be adjusted with adjusting washers between armature element (6.2) and shaft (5.2).
- ► Only for internal centring: Insert the locking ring into the magnet (1).
- ► Mount the feather keys (4.1 and 4.2) in the motor shafts (5.1 and 5.2).
- ► Mount the magnet (1) with the socket head screws (2.1) to the mounting surface (3).
- ► Slide the rotor (10) onto the motor shaft (5.1) observe the mounting dimension N_1. Secure the rotor axially on the motor shaft (5.1) with a shaft end plate or with a locking ring (7.1).
- ► Slide the anchor element (6.2) onto the shaft (5.2). Secure the anchor element axially with a locking ring or alternatively with the threaded pin (8.1).
- ► Check the air gap X. Adjust it, if necessary.

4.2.3 Assembly of shaft-mounted coupling with flange

Example 2-A: Shaft-mounted coupling with flange and armature element without hub

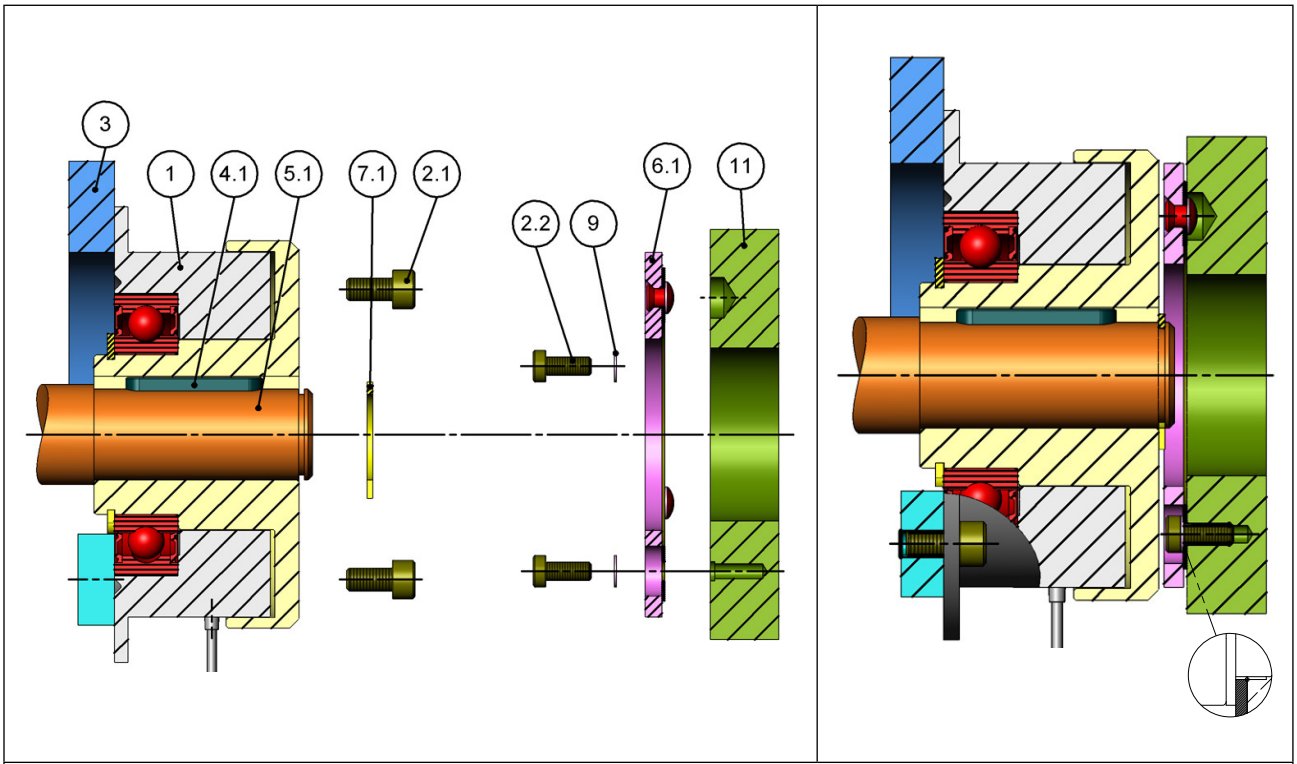


Figure 5: Shaft-mounted coupling with flange and armature element without hub (e.g. 06…07-03-210-xxxx)

- ► The shaft (5.1 / 5.2) of the motor and the mounting surfaces (3/11) must be designed in such a way that the air gap X result automatically during installation.
- ► Mount the feather key (4.1) into the motor shaft (5.1).
- ► Only for size 06…07: Slide the magnet with flange and mounted rotor (1) onto the shaft (5.1). Mount the magnet with the socket head screws (2.1) to the mounting surface (3).
- ► If the magnet flange shall be used as torque arm, one of the mounting holes in the flange is used to secure against rotation (bearing friction only) on the mounting surface (3). In addition, the magnet with mounted rotor (1) is secured axially with the locking ring (7.1) or a shaft end disc.
- ► Place the armature element (6.1) against the screw mounting surface on the customer side (6) and tighten the socket head screws (2.2) lightly with the Schnorr lock washers (9).
- ► Align the armature element and tighten the socket head screws
- ► Mount the component (6.1/11).
- ► Secure the component (6.1/11) axially.
- ► Check the air gap X. Adjust it, if necessary.

Example 2-B: Shaft-mounted coupling with flange & armature element hub neck outside

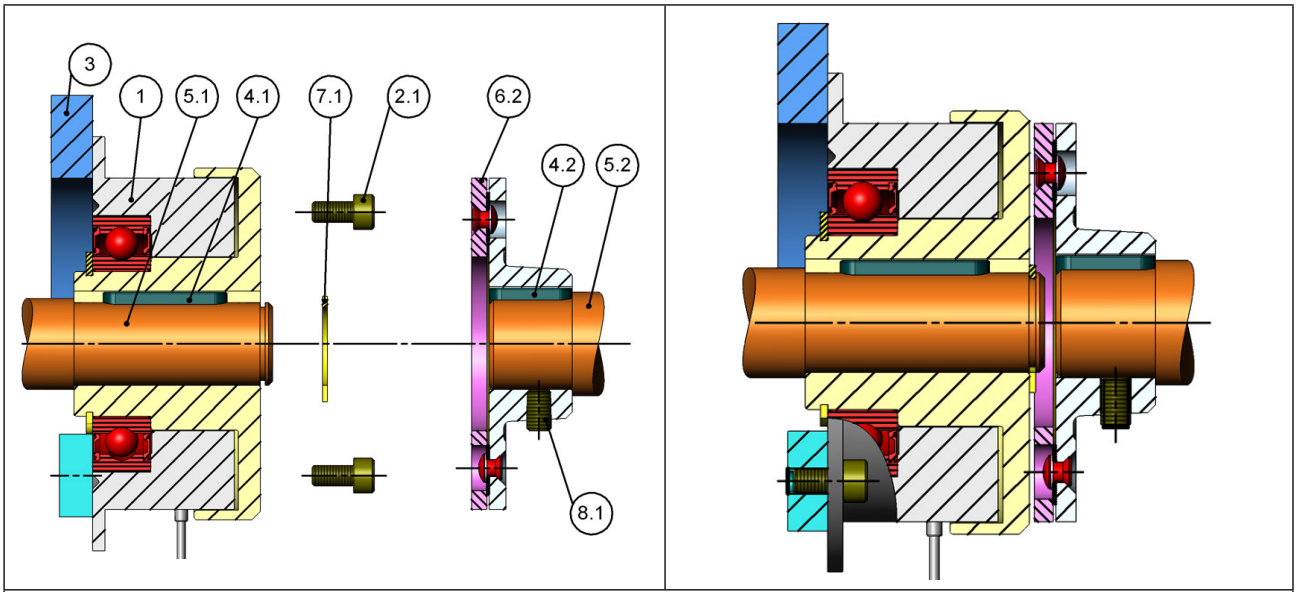


Figure 6: Shaft-mounted coupling with flange & armature element hub neck outside (e.g. 06…07-03-230-xxxx)

- The shafts (5.1/5.2) of the motor and the mounting surface (3) must be designed in such a way that the air gap X result automatically during installation.
- If necessary, the air gap X can be adjusted with adjusting washers between armature element (6.2) and shaft (5.2).
- Mount the feather keys (4.1 and 4.2) in the motor shafts (5.1 and 5.2).
- Only for size 06…07: Slide the magnet with flange and mounted rotor (1) onto the shaft (5.1). Mount the magnet with the socket head screws (2.1) to the mounting surface (3).
- If the magnet flange shall be used as torque arm, one of the mounting holes in the flange is used to secure against rotation (bearing friction only) on the mounting surface (3). In addition, the magnet with mounted rotor (1) is secured axially with the locking ring (7.1) or a shaft end disc.
- Slide the anchor element (6.2) onto the shaft (5.2). Secure the anchor element axially with a locking ring or alternatively with the threaded pin (8.1).
- Check the air gap X. Adjust it, if necessary.

4.2.4 Installation of shaft-mounted coupling with torque arm

Example 3-A: Shaft-mounted coupling with torque arm & armature element without hub

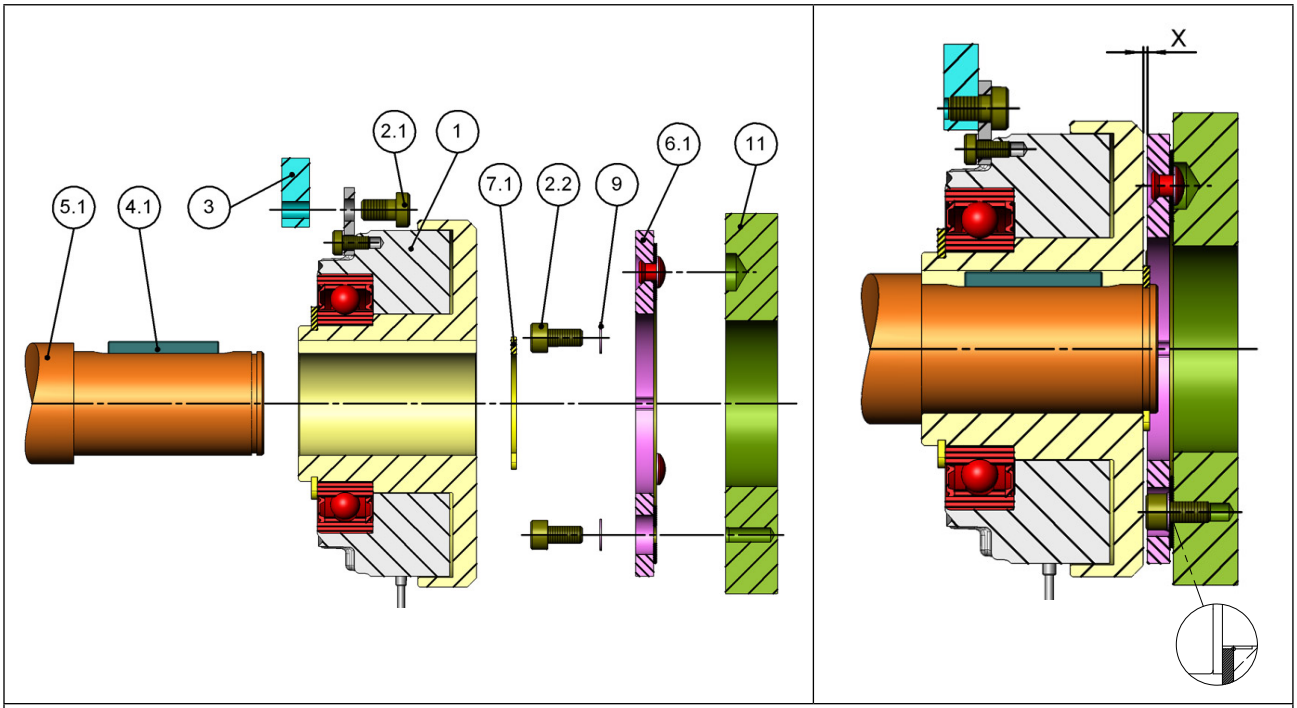


Figure 7: Shaft-mounted coupling with torque arm & armature element without hub (e.g. 08…12-03-710-xxxx)

- ► The shaft (5.1 / 5.2) of the motor and the mounting surfaces (3/11) must be designed in such a way that the air gap X result automatically during installation.
- ► Mount the feather key (4.1) into the motor shaft (5.1).
- ► Slide the magnet with mounted rotor (1) onto the shaft (5.1).
- ► Secure the rotor axially with a shaft end disc or with the locking ring (7.1).
- ► Only for size 08…12: Secure the magnet with mounted torque arm (1) to the mounting surface (3) against twisting (only bearing friction).
- ► Place the armature element (6.1) against the screw mounting surface on the customer side (6) and tighten the socket head screws (2.2) lightly with the Schnorr lock washers (9).
- ► Align the armature element and tighten the socket head screws.
- ► Mount the component (6.1/11).
- ► Secure the component (6.1/11) axially.
- ► Check the air gap X. Adjust it, if necessary.

Example 3-B: Shaft-mounted coupling with torque arm & armature element - hub neck outside

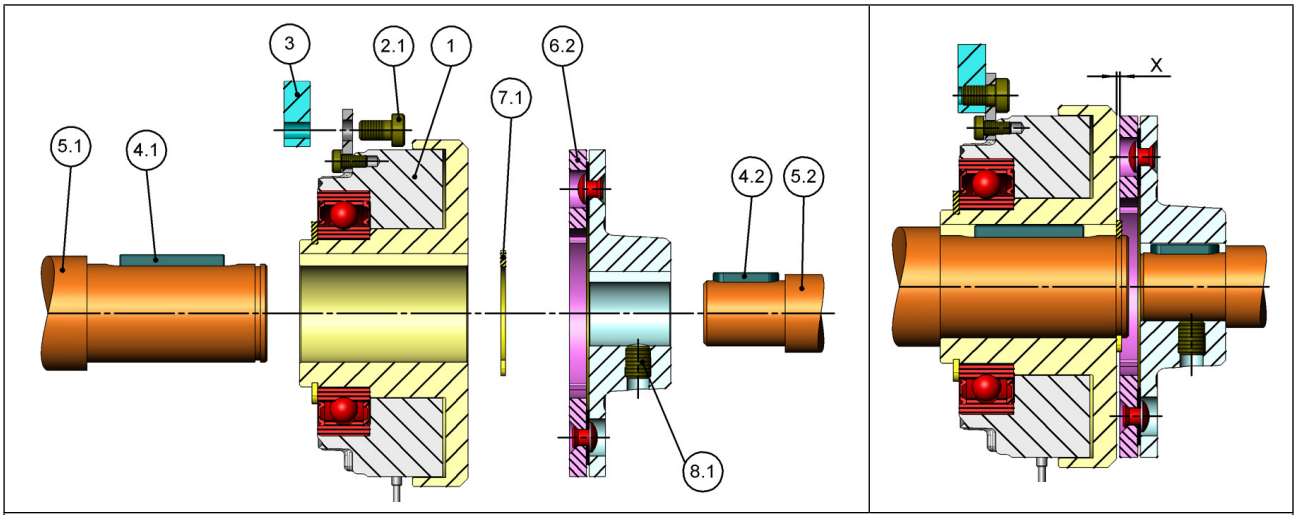


Figure 8: Shaft-mounted coupling with torque arm & armature element - hub neck outside (e.g. 08…12-03-730-xxxx)

- ► The shafts (5.1/5.2) of the motor and the mounting surface (3) must be designed in such a way that the air gap X result automatically during installation.
- ► If necessary, the air gap X can be adjusted with adjusting washers between armature element (6.2) and shaft (5.2).
- ► Mount the feather keys (4.1 and 4.2) in the motor shafts (5.1 and 5.2).
- ► Slide the magnet with mounted rotor (1) onto the shaft (5.1).
- ► Secure the rotor axially with a shaft end disc or with the locking ring (7.1).
- ► Only for size 08…12: Secure the magnet with mounted torque arm (1) to the mounting surface (3) against twisting (only bearing friction).
- ► Slide the anchor element (6.2) onto the shaft (5.2). Secure the anchor element axially on the shaft with a locking ring or with the threaded pin (8.1).
- ► Check the air gap X. Adjust it, if necessary.

Example 4-A: Shaft-mounted coupling with torque arm & armature element without hub

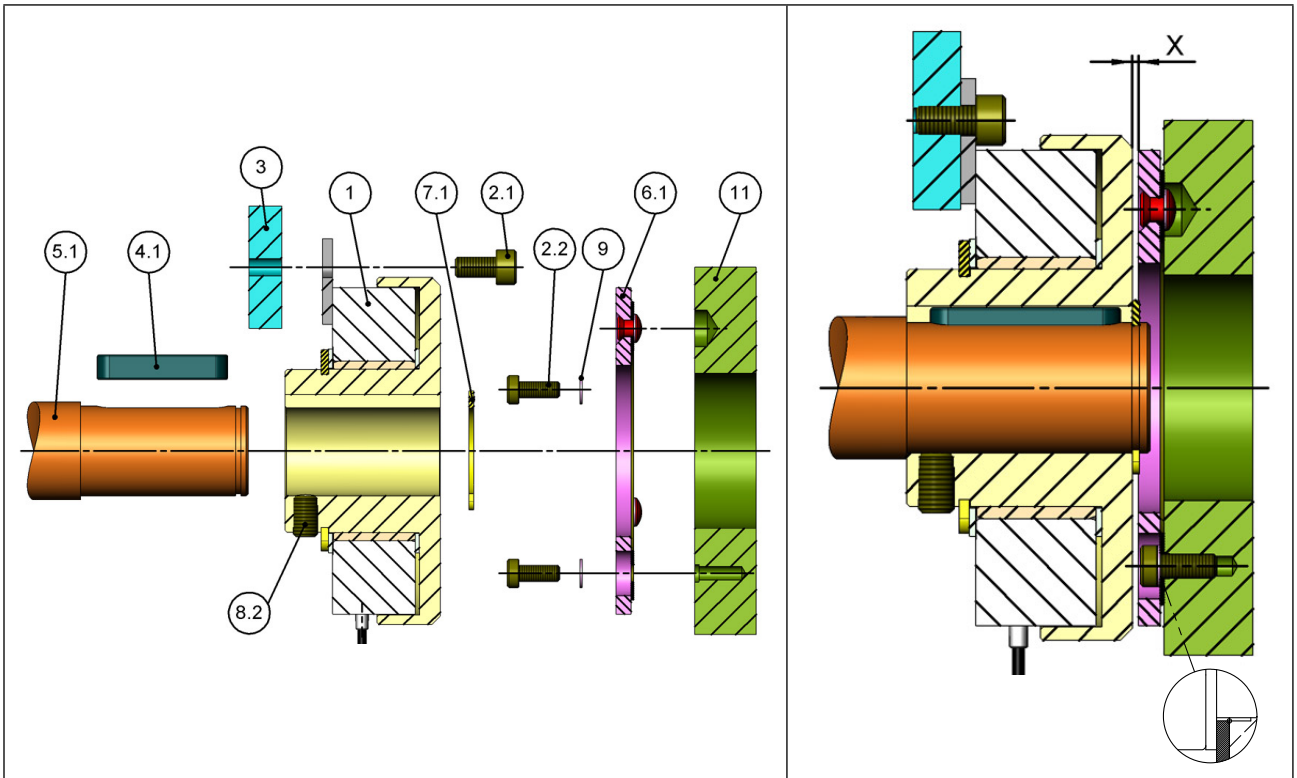


Figure 9: Shaft-mounted coupling with torque arm & armature element without hub (e.g. 01…07-03-610-xxxx)

- ► The shafts (5.1/5.2) of the motor and the mounting surface (3) must be designed in such a way that the air gap X result automatically during installation.
- ► Mount the feather key (4.1) into the motor shaft (5.1).
- ► Slide the magnet with mounted rotor (1) onto the shaft (5.1).
- ► Secure the rotor axially with the threaded pin (8.2) or a locking ring (7.1).
- ► Only for size 01…07: Secure the magnet with mounted torque arm (1) to the mounting surface (3) against twisting (only bearing friction).
- ► Place the armature element (6.1) against the screw mounting surface on the customer side (6) and tighten the socket head screws (2.2) lightly with the Schnorr lock washers (9).
- ► Align the armature element and tighten the socket head screws with the recommended tightening torques.
- ► Mount the component (6.1/11).
- ► Secure the component (6.1/11) axially.
- ► Check the air gap X. Adjust it, if necessary.

Example 4-B: Shaft-mounted coupling with torque arm & armature element hub neck outside

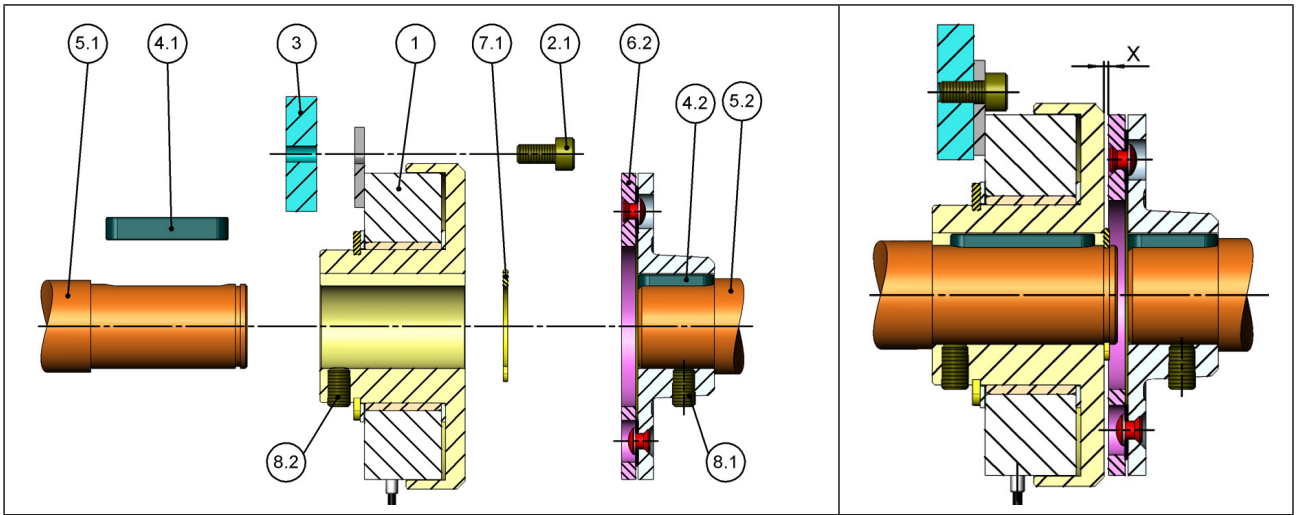


Figure 10: Shaft-mounted coupling with torque arm & armature element hub neck outside (e.g. 01…07-03-630-xxxx)

- ► The shafts (5.1/5.2) of the motor and the mounting surface (3) must be designed in such a way that the air gap X result automatically during installation.
- ► If necessary, the air gap X can be adjusted with adjusting washers between armature element (6.2) and shaft (5.2).
- ► Mount the feather keys (4.1 and 4.2) in the motor shafts (5.1 and 5.2).
- ► Slide the magnet with mounted rotor (1) onto the shaft (5.1).
- ► Secure the rotor axially with the threaded pin (8.2) or a locking ring (7.1).
- ► Only for size 01…07: Secure the magnet with mounted torque arm (1) to the mounting surface (3) against twisting (only bearing friction).
- ► Slide the anchor element (6.2) onto the shaft (5.2). Secure the anchor element axially with a locking ring or with the threaded pin (8.1).
- ► Check the air gap X. Adjust it, if necessary.

Example 4-C: Shaft-mounted coupling with torque arm & armature element hub neck mounted outside

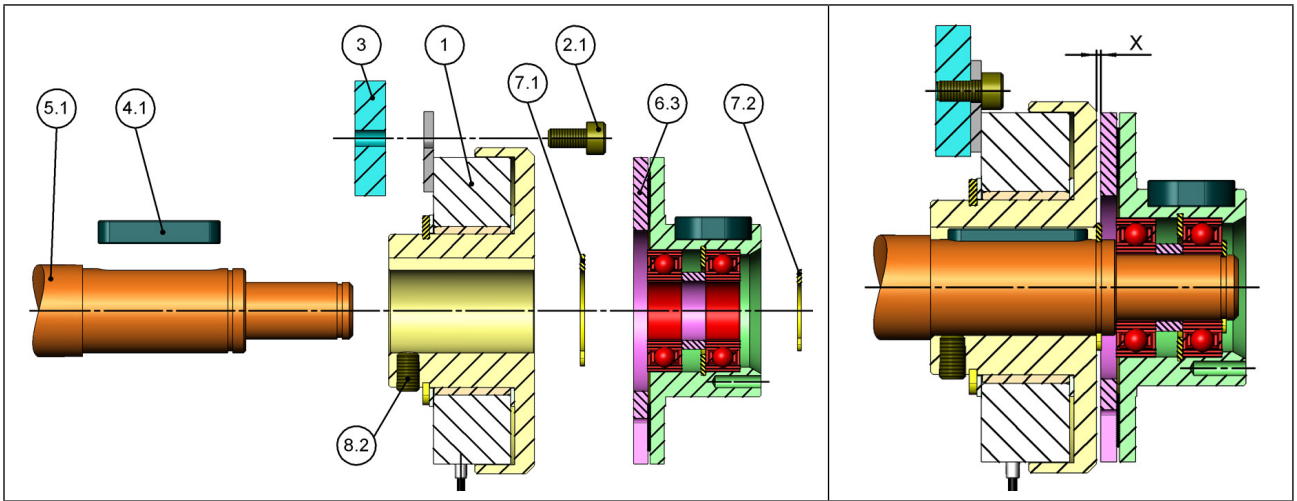


Figure 11: Shaft-mounted coupling with torque arm & armature element hub neck mounted outside (e.g. 01…07-03-640-xxxx)

- ► The shafts (5.1) of the motor and the mounting surface (3) must be designed in such a way that the air gap X result automatically during installation.
- ► If necessary, the air gap X can be adjusted with adjusting washers between armature element (632) and shaft (5.1).
- ► Mount the feather key (4.1) into the motor shaft (5.1).
- ► Slide the magnet with mounted rotor (1) onto the shaft (5.1).
- ► Secure the rotor axially with a shaft end disc or with the locking ring (7.1).
- ► Secure the magnet with mounted torque arm (1) to the mounting surface (3) against twisting (only bearing friction).
- ► Press the armature element (6.3) onto the shaft (5.1)
- ► Secure the armature element axially with the locking ring (7.2), observe the air gap X.

4.2.5 Assembly of shaft-mounted coupling with bearing retainer for the output

Example 5: Shaft-mounted coupling with bearing retainer for the output

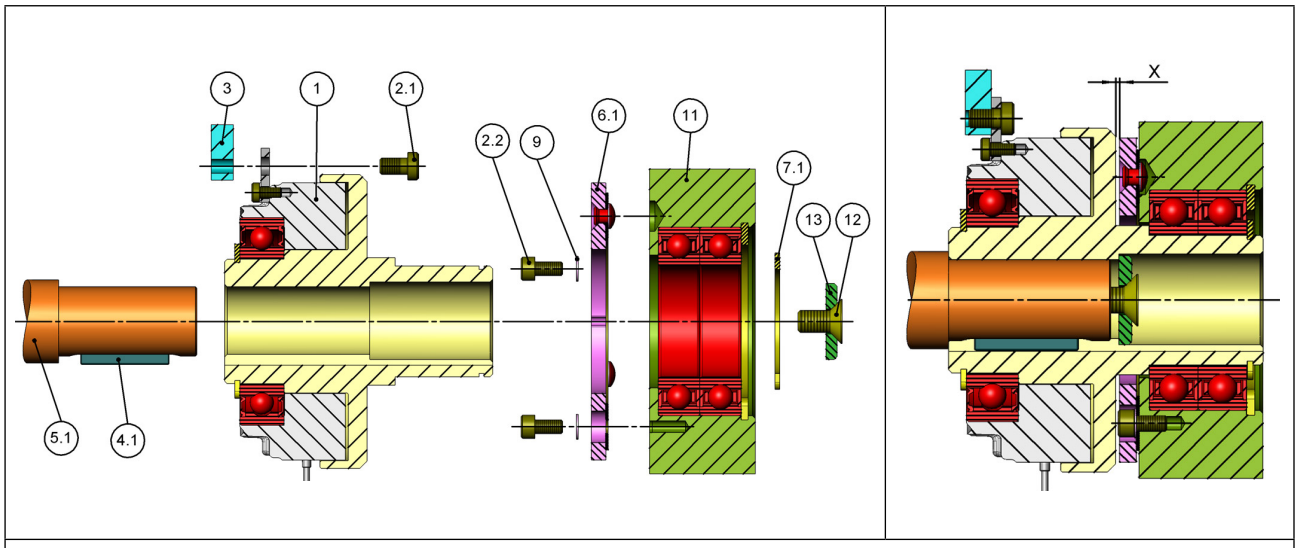


Figure 12: Shaft-mounted coupling with bearing retainer for the output (e.g. 06…12-03-810-xxxx)

- ► The mounting surface (11) must be designed in such a way that the air gap X result automatically during installation.
- ► If necessary, the air gap X can be adjusted with adjusting washers between mounting surface (11) and rotor.
- ► Mount the feather key (4.1) into the motor shaft (5.1).
- ► Place the armature element (6.1) against the screw mounting surface on the customer side (6) and tighten the socket head screws (2.2) lightly with the Schnorr lock washers (9).
- ► Align the armature element and tighten the socket head screws.
- ► Press the assembled component (11) onto the rotor neck of the shaft (5.1).
- ► Secure the component axially with the locking ring (7.1), observe the air gap X.
- ► Secure the coupling axially on the shaft with a shaft end disc (13) and counter-sunk screw (12).
- ► Check the air gap X. Adjust it, if necessary.

4.2.5.1 Check the air gap X

Further information on the air gap which becomes larger as a result of wear (=> *„9.2.2 Check air gap“*).

4.3 Tightening torques of the threaded pins

Tightening torques of the threaded pins according to *DIN EN ISO 4029*.

Threaded pin	Tightening torque in Nm
M3	0.9
M4	2.5
M5	5
M6	8.5
M8	20
M10	40
M12	65

Table 6: Tightening torques of the threaded pins

5 Electrical connection

⚠ DANGER

Electrical voltage at coupling and motor!

Danger to life due to electric shock!

► When carrying out any work on the coupling, switch off the supply voltage to the motor and secure it against switching on.

NOTICE

Voltage peaks when switching off!

► Install protective circuit for coupling and control.

► The protective circuit extends the connection times.

5.1 Connection of the coupling

NOTICE

Destruction of the coupling if the voltage supply is incorrect.

► The coupling is operated with DC voltage.

► Read the rated voltage from the nameplate or the magnetic marking on the coupling.

► Compare with existing voltage source.

► The maximum input voltage U_{in} must not be exceeded.

► Only connect if the values match.

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 coupling COMBINORM type C is supplied from the factory with preassembled connection cables:

COMBINORM Type C	**01...06**	**07...12**
Strand cross-sections in mm²	0.25	0.75
Strand length standard in mm	400^{+100}	

Table 7: Connection of the coupling

6 Start-up

6.1 Checks before start-up of the coupling

Visual inspection

- Do the connection and rated voltage (nameplate / magnet labelling) match?
- Are external damages visible?
- Are there impurities in the functional area or foreign bodies in the air gap of the coupling?

Load-free testing

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

NOTICE

Damage due to non-observance!

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

6.1.1 Run in of the coupling

NOTICE

Damage due to insufficient torque!

► The torque is only reached after the coupling has run in.

Notes on run in process

- Do not energise magnets.
- Fix the rotor.
- Let the drive/motor rotate with a speed of 25 rpm.
- Carry out the following function run in:
  - ► See *„6.1.1.1 Function rnning-in“*.
- Stop the drive / motor.
- Check the torque.
- If the torque is not reached, the cycle must be repeated.

6.1.1.1 Function rnning-in

Application: First running-in at the customer, 100 % run-in at KEB.

Device size		01	02	03	05	06	07	08	09	10	11	12
Slip time	*t* / s	1										
Idle time	*t* / s	1				0.5						
Speed	*n* / rpm	25										
Switching cycles		20									15	

Table 8: Function running-in

6.1.1.2 Maintenance running-in

Application: Coupling recovery due to unfavourable operating conditions.

Device size		01	02	03	05	06	07	08	09	10	11	12
Slip time	*t* / s	1										
Idle time	*t* / s	1				0.5						
Speed	*n* / rpm	25										
Switching cycles		3										

Table 9: Maintenance running-in

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

NOTICE

Lower torque than single-surface coupling!

► If the coupling is used as single-surface coupling without dynamic load, the torque can drop. A new run in (refreshment) must be done within the scope of maintenance.

7 Operation

The coupling is only electrically controlled.
There are no manual operating options.

8 Troubleshooting

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

Malfunction	Cause	Measures
Coupling does not close	Incorrect voltage	Only operate the coupling with the correct voltage (=> Magnet marking of the coupling)
	Air gap too large, maximum air gap reached	Replace the coupling
	Foreign objects between armature and rotor	Remove the foreign objects. Perform a run in (=> *„6.1.1 Run in of the coupling“*)
	Magnet coil or connecting cable defective	Replace the coupling
	Excessive heating	Install a high-speed circuit breaker (for example, KEB Powerbox)
The shaft is slipping	Friction surfaces contaminated	Replace the coupling. If necessary, it could help to let the coupling run in again (=> *„6.1.1 Run in of the coupling“*)
Coupling opens with a delay, long release time	Coupling is switched on the AC side	Switch the coupling on DC side
Coupling does not open	Foreign object between hub and armature	Remove the foreign objects

9 Maintenance and service

- Observe the general safety instructions.
- The coupling must not be under voltage during maintenance and repair work!
- Protect electrical and electronic components from splash water.

9.1 Maintenance intervals

The coupling COMBINORM Type C is primarily maintenance-free. As a result of wear occurring during operation, the air gap increases. The function of the coupling can only be ensured when the air gap X is checked at regular intervals.

9.2 Service

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

⚠ CAUTION

Limbs crushed!

Securing the load!

► Mechanically secure the load against unintended movement.

► Release coupling from load.

► Dismount the coupling according to the manual.

9.2.1 Dismount the coupling

► Dismounting is done with disconnected power supply.

► Loosen and remove the three socket head screws including lock washers on the armature element.

► Remove the armature element from the mounting surface.

► Remove the locking ring from the shaft.

► Remove the rotor from the shaft.

► Remove the three socket head screws.

► Dismount the magnet.

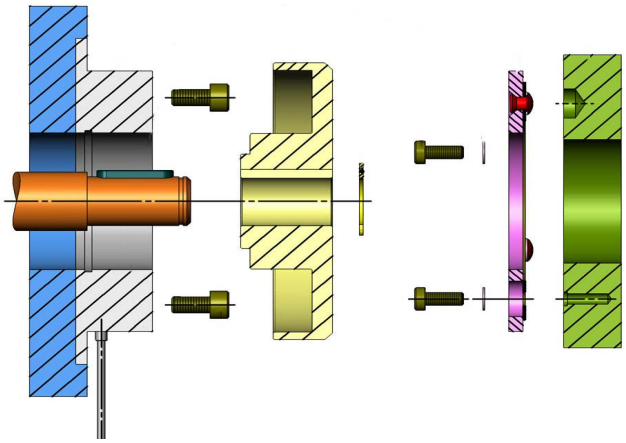


Figure 13: Dismount the coupling (example version 110)

9.2.2 Check air gap

As a result of wear occurring during operation, the air gap increases. To ensure proper functioning, the air gap X needs to be checked at regular intervals. When checking the air gap pay attention that parallelism and axial run-out tolerances must be added to the rated air gap X.

Size	Air gap	
	Rated value X	Limit value X_{max} [1]
	mm	mm
01	0.1	0.3
02	0.15	0.3
03	0.15	0.35
05	0.2	0.5
06	0.2	0.7
07	0.2	0.7
08	0.2	0.7
09	0.3	0.9
10	0.3	1.0
11	0.4	1.2
12	0.4	1.2

Table 10: Check air gap

[1] *The air gap where replacement is recommended.*

9.2.2.1 Checking the air gap X

- ► Use a feeler gauge to check the air gap X.
- ► The coupling must be replaced if the air gap X is greater than X_{max}.

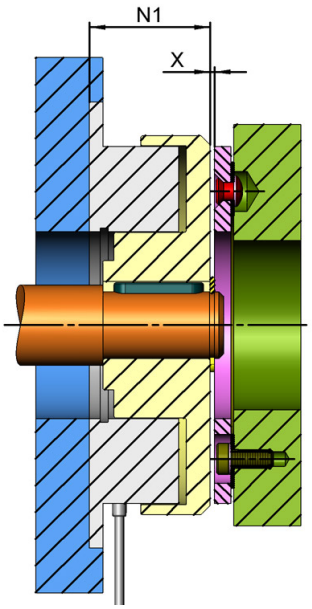


Figure 14: Checking the air gap

9.2.3 Replace the coupling

- ► When replacing, the rotor and armature elements (in pairs) must be replaced.
- ► Disconnect the connecting cable(s) from the voltage supply.
- ► Dismount the coupling (=> *9.2.1 Dismount the coupling*)
- ► The coupling is assembled in reverse order (=> *9.2.1 Dismount the coupling*).
- ► Check the air gap X (=> *9.2.2 Check air gap*).
- ► Functional test and start-up (=> *6 Start-up*).

10 Dismounting and disposal

10.1 Dismounting

For dismounting the coupling => *„9.2.1 Dismount the coupling“*.

10.2 Disposal

Separated according to the materials used, dispose of the electromagnetic coupling 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:

Solenoid with coil, rotor and lining, cable and all other steel parts:

Core scrap (Key No.: EAK 12 01 02)

Aluminium components:

Nonferrous metals (this includes copper) (Key No.: EAK 16 01 18)

11 Certification

11.1 EU declaration of conformity

EU KONFORMITÄTSERKLÄRUNG

Dokument-Nr. / Monat.Jahr: ce_bc_rns-bc-b_de.docx / 01.2022

Hersteller:	KEB Automation KG Südstraße 38 32683 BARNTRUP	
Produktbezeichnung:	Federdruck - Bremsen	COMBISTOP
	Permanentmagnet Bremsen	COMBIPERM
	Elektromagnet Kupplung und Bremsen	COMBINORM
	Kupplungs – Bremsen Kombinationen in einem Gehäuse	COMBIBOX
	Größe	01 bis 14
	Spannungsklassen	71...440Vdc / 50 … 690Vac

Diese Konformitätserklärung ist unter alleiniger Verantwortung der KEB Automation KG erstellt worden

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein:

Number:	**Niederspannung : 2014 / 35 / EU**
Text:	Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedsstaaten betreffend elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen.
Number:	**Gefährliche Substanzen: 2011 / 65 / EU (inkl. 2015 / 863 / EU)**
Text:	Richtlinie des Rates zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten.

Weitere Angaben zur Einhaltung dieser Richtlinien enthält der Anhang.

Anbringung der CE-Kennzeichnung: ja

Aussteller: KEB Automation KG
Südstraße 38
32683 BARNTRUP

Ort, Datum Barntrup, 28.12.2021

Rechtsverbindliche Unterschrift:

i. A. W. Hovestadt / Normenbeauftragter

W. Wiele / Technischer Leiter

Die Anhänge sind Bestandteil dieser Erklärung.
Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften.

Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

EU DECLARATION OF CONFORMITY

ANHANG 1

Dokument-Nr. / Monat.Jahr: ce_bc_rns-bc-b_de.docx / 01.2022

Produktbezeichnung:	Federdruck - Bremsen	COMBISTOP
	Permanentmagnet Bremsen	COMBIPERM
	Elektromagnet Kupplung und Bremsen	COMBINORM
	Kupplungs – Bremsen Kombinationen in einem Gehäuse	COMBIBOX
	Größe	01 bis 14
	Spannungsklassen	71...440Vdc (50 … 690Vac)

Die Übereinstimmung des bezeichneten Produktes mit den Vorschriften der

Richtlinie 2014/35/EU wird nachgewiesen durch die vollständige Einhaltung der folgend angegebenen harmoisierten Normen.

EN - Norm	Text	Referenz	Ausgabe
----------	Elektromagentische Geräte und Komponenten	VDE 0580	11 / 2011
Informativ			
EN 50178 Ausgabe 1997	Ausrüstung von Starkstromanlagen mit elektronischen Betriebsmitteln	VDE 0160	04 / 1998

Richtlinie 2011/65/EG und der Änderung über 2015/863/EU wird nachgewiesen durch die Qualifikation von Bauteilen und Fertigungsverfahren im Rahmen der durch ISO 9001 vorgegebene Qualitätssicherung. Die entsprechenden Informationen und Beschreibungen sind dokumentiert und abgelegt.

EN 63000: 2018	Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährlicher Stoffe

Das bezeichnete Produkt wurde unter einem umfassenden Qualitätsmanagementsystem entwickelt, hergestellt und geprüft.

Die Konformität des Qualitätsmanagementsystems nach DIN ISO 9001 wurde bescheinigt durch:

Notifizierte Stelle:	TÜV - CERT
Anschrift:	Zertifizierungsstelle des RWTÜV Steubenstrasse 53 D - 45138 Essen
Nummer der Bescheinigung	041 004 500
Ausstelldatum:	20.10.94
Gültig durch Nachprüfung bis:	12.2024

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Figure 13: 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 Barntrup,
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 Pl (dimensions 01 - 10), 8 - 50 W
Type 15 (dimension 02-10), 8 - 50 W

Electromagnetic Clutches and Brakes, COMBINORM, open type, 205 VDC 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

DQD 507 Rev. 2016-02-18 Page 1

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 Pl, 15; COMBINORM, Types 02, 03, 04.

DQD 507 Rev. 2016-02-18 Page 1

Figure 14: CSA Certificat

12 Revision history

Version	Date	Description
01	2011-09	First edition
02	2020-03	Complete editorial revision
03	2022-12	Change of cover picture, content adjustments

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