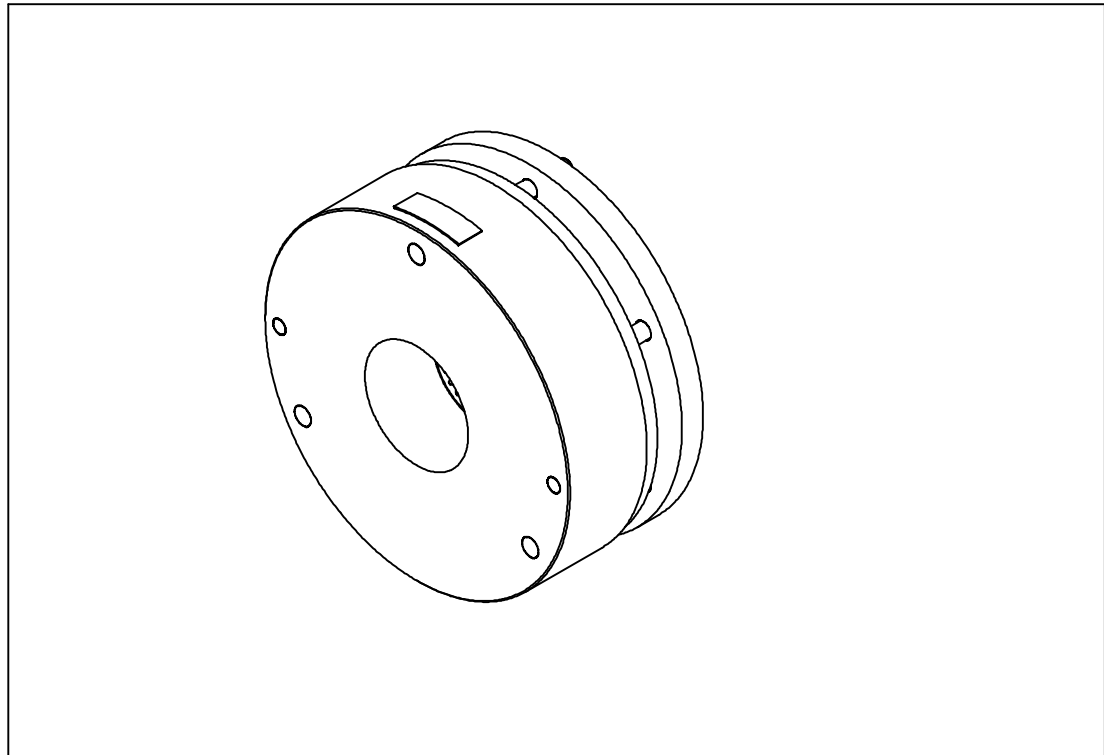
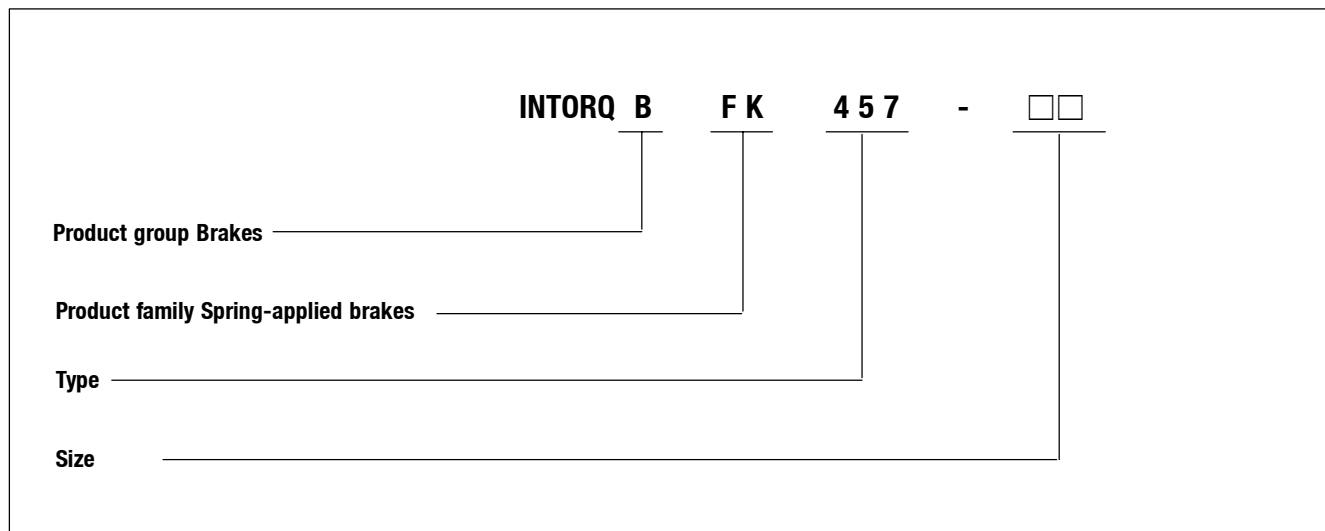


Operating Instructions



***Spring-applied brakes with
electromagnetic release
INTORQ BFK457-□□***

Product key



- The data indicated in the product key and on the nameplate and stickers on the packaging are valid for spring-applied brakes of the series INTORQ BFK457.

Nameplate

Assembly

Field	Contents	Example
1	Manufacturer CE mark	
2	Brake type	
3	Rated voltage Rated power	
4	Order no.. Rated brake torque Date of manufacture	

Packaging sticker

Assembly

Field	Contents	Example
1	Manufacturer Barcode of no.	
2	Name Order no.	
3	Type see Product code Rated brake torque No. per box	
4	Rated voltage Rated power Packaging date	
5	Addition CE mark	

These Operating Instructions are valid for the following spring-applied brakes:

INTORQ BFK457-01
INTORQ BFK457-02
INTORQ BFK457-03
INTORQ BFK457-04
INTORQ BFK457-05
INTORQ BFK457-06
INTORQ BFK457-08
INTORQ BFK457-10
INTORQ BFK457-12
INTORQ BFK457-14
INTORQ BFK457-16

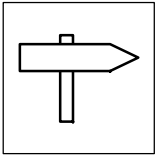
What is new / what has changed ?

Material No.	Edition	Important	Contents
00 399 720	1.0 09/1997 TD09	1st edition	First edition for preseries
00 399 720	2.0 07/2000 TD09	2nd edition	Address revision; Change of rated data
00 458 071	1.0 09/2002 TD09	1st edition replaces 399 720	All chapters: Completely revised Sizes 10 - 16 added to the Operating Instructions Sizes 06 and 08 modified for spacer user Change of company name Basic and compact design
00 000 000	2.0 05/2005 TD09	2nd edition replaces 458 071	Change of the firm's name to INTORQ Completely revised, including the sizes 01 and 02.

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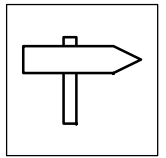
No part of this documentation may be reproduced or made accessible to third parties without written consent by INTORQ GmbH & Co. KG.

All indications given in these Operating instructions have been selected carefully. We will include necessary corrections in subsequent editions.

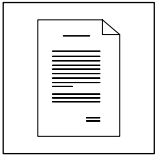


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1 Preface and general information

1.1 About these Operating Instructions ...

- These Operating Instructions are intended for safety-relevant operation on and with electromagnetically released spring-applied brakes. They contain safety information which must be observed.
- All persons who work on and with electromagnetically released spring-applied brakes must have the Operating Instructions available and observe all relevant notes and instructions.
- The Operating Instructions must always be in a complete and perfectly readable state.

1.1.1 Terminology used

Brake

In the following text, the term "spring-applied brake" is used for "electromagnetically released spring-applied brake".

Drive system

In the following text, the term "drive system" is used for drive systems with spring-applied brakes and other drive components.

1.2 Scope of supply

- The drive systems are individually combined to the modular design. The scope of supply is indicated in the accompanying papers.
- After reception of the delivery, check immediately whether the scope of supply matches with the accompanying papers. INTORQ GmbH & Co. KG does not accept any liability for deficiencies claimed subsequently. Claim
 - visible transport damage immediately to the forwarder.
 - visible deficiencies/incompleteness immediately to your INTORQ representative.



1.3 Drive systems

1.3.1 Labelling

- Drive systems and components are unambiguously designated by the indications on the nameplate.
- Manufacturer:
INTORQ GmbH & Co. KG
Postfach 11 03
D-31849 Aerzen
Wülmser Weg 5
D-31855 Aerzen

1.3.2 Application as directed

- Drive systems
 - are intended for the use in machines and systems.
 - must only be used for the purposes ordered and acknowledged.
 - must only be operated under the conditions stated in the Operating Instructions.
 - must not be operated beyond the indicated power limits.

Any other use shall be deemed inappropriate!

1.3.3 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.
- INTORQ does not accept any liability for damage and operating interference caused by:
 - must not be operated beyond the indicated power limits.
 - unauthorized modifications to the controller.
 - improper working on and with the controller.
 - operating mistakes
 - disregarding these Instructions.

Warranty

- Warranty conditions: see Sales and Delivery Conditions of INTORQ GmbH & Co. KG.
- Warranty claims must be made to the INTORQ representative responsible for you immediately after detecting defects or faults.
- The warranty is void all cases where liability claims cannot be made.



2 Safety information

2.1 Persons responsible for the safety

Operator

- An operator is any natural or legal person who uses the spring-applied brake on behalf of whom the drive system is used.
- The operator or his safety officer are obliged
 - to check whether all relevant regulations, notes, and laws are observed,
 - that only qualified personnel work on and with the drive system,
 - to ensure that the personnel have the Operating Instructions available for all corresponding operations and
 - to prohibit non-qualified personnel from working with and on the controller.

Qualified personnel

Qualified personnel are persons who are - because of their education, experience, instructions, and knowledge about corresponding standards and regulations, rules for the prevention of accidents, and operating conditions - authorized by the person responsible for the safety of the plant to perform the required actions and who are able to recognize and avoid potential hazards. (see IEC 364, definition for qualified personnel).

2.2 General safety information

- These safety notes do not claim to be complete. In case of questions and problems please contact your INTORQ representative.
- At the time of supply the spring-applied brake is state-of-the-art and ensures basically safe operation.
- The spring-applied brake is hazardous to persons, the spring-applied brake itself and other properties of the operator, if
 - that only qualified personnel work on and with the spring-applied brake.
 - that the spring applied brake is not used improperly.
- Spring-applied brakes must be designed so that they comply with their function and do not cause any hazards to persons when correctly installed and in fault-free operation as directed. This is also effective for the interaction with the entire system.
- The spring-applied brake must only be operated in perfect state.
- Retrofittings or changes of the spring-applied brake are generally prohibited. In any case, INTORQ GmbH & Co. KG must be contacted.
- The friction linings must be carefully protected from grease or oil since even small amounts of lubricants reduce the brake torque considerably.
- With application conditions according to enclosure IP54, the brake torque will usually not be reduced. Because of the great variety of applications, it is however necessary to check the functionality of all mechanical components under the specific conditions.



Possible applications of the spring-applied brake INTORQ BFK457-□□:

- No explosive or aggressive atmosphere.
- Humidity, no restriction.
- Ambient temperature -20°C bis +40°C.
- With high humidity and low temperatures
 - Take measures to protect armature plate and rotor from freezing.
- Electrical connections must be protected against contact.

2.3 Layout of the safety information

- All safety information given in these Operating Instructions has the same layout:



Signalword!

Note

- The icon characterizes the type of danger.
- The signal word characterizes the severity of danger.
- The note describes the danger and suggests how to avoid the danger.

Warning of danger for persons

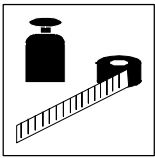
Icons used		Signal words	
	Warning of hazardous electrical voltage	Danger!	Warns of impending danger . Possible consequences if disregarded: Death or very severe injuries.
		Warning!	Warns of potential, very hazardous situations . Possible consequences if disregarded: Death or very severe injuries.
		Caution!	Warns of potential, hazardous situations . Possible consequences if disregarded: light or minor injuries.

Warning of material damage

Icons used		Signal words	
		Stop!	Warns of potential damage to material . Possible consequences if disregarded: Damage of the drive system/controller or its environment.

Other notes

Icons used		Signal words	
		Note!	Indicates a general, useful note. If you observe it, handling of the controller/drive system is made easier.



3 Technical data

3.1 Product description

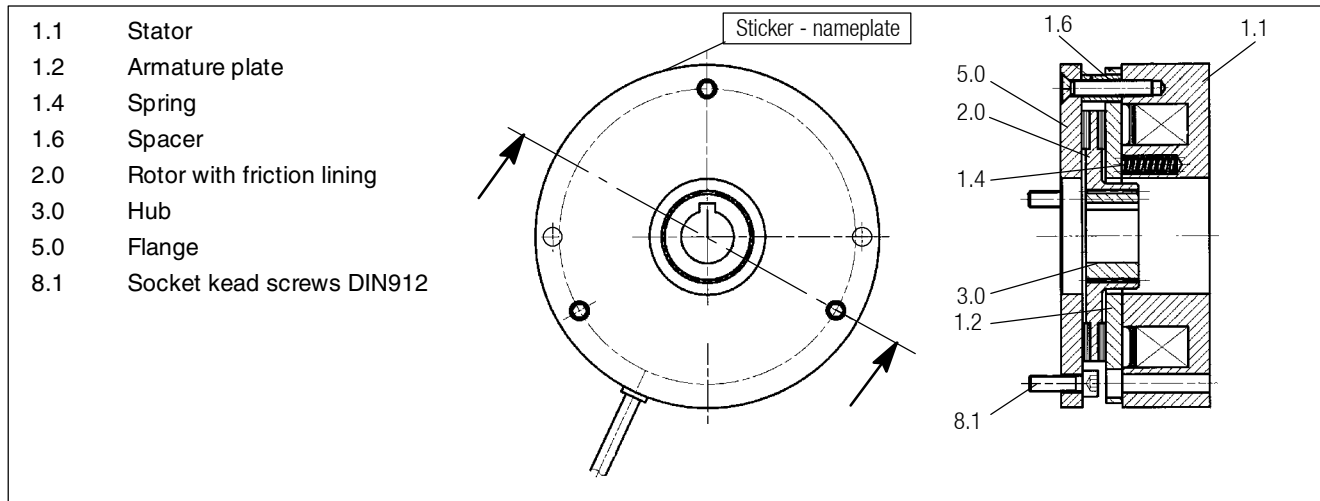


Fig. 1 Spring-applied brake: INTORQ BFK457-01...16 Compact, completely mounted with rotor and flange

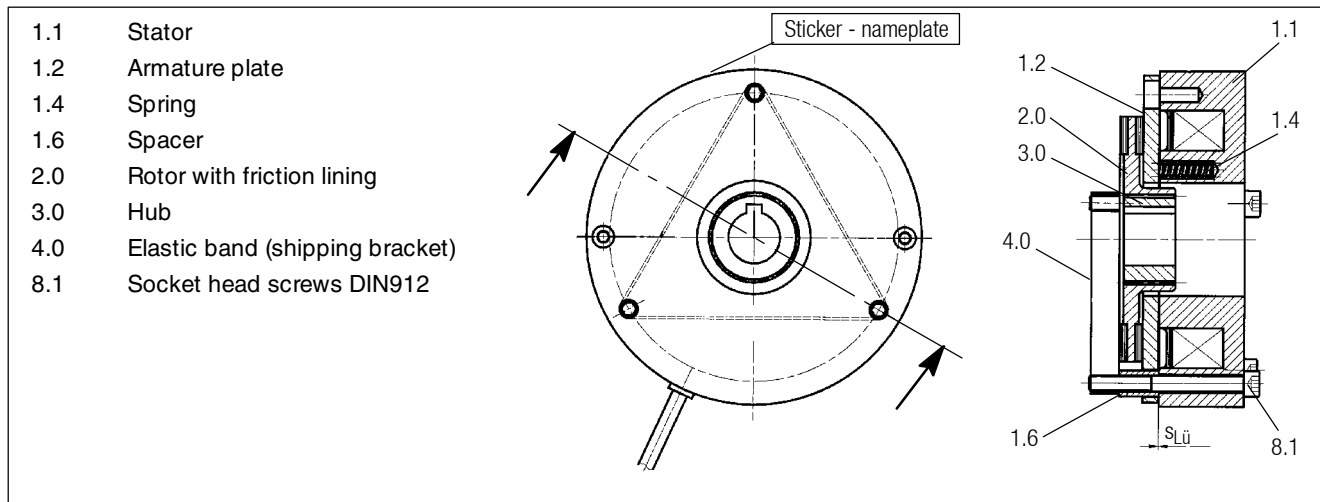
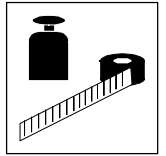


Fig. 2 Spring-applied brake: INTORQ BFK457-06...16 Basic, Stator complete with rotor



3.1.1 General

The spring-applied brake INTORQ BFK457-□□ is a single disc pulley with two friction surfaces. The brake torque is generated by several (size 01...16) pressure springs (1.4). The brake is released electromagnetically.

The spring-applied brake INTORQ BFK457-□□ is designed for the conversion of mechanical work and kinetic energy into heat energy. For operating speeds see chapter 3.2, Rated data. Due to the static brake torque, the brake can hold loads without speed difference. Emergency braking is possible at high speed, see chapter 3.2, Rated Data. The more friction work, the higher the wear. Please take into account that the friction value and thus the torque depend on the speed.



Stop!

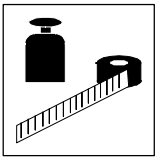
The spring-applied brakes INTORQ BFK457, sizes 01 to 16 use spacers (1.6). It is not possible to readjust the brake in the event of wear. If necessary, the rotor must be replaced.

3.1.2 Braking

When braking, the rotor (2.0), which is moveable on the hub (3.0), is pressed against the friction surface by the inner and outer springs (1.4) via the armature plate (1.2). The asbestos-free friction linings ensure a high brake torque with low wear. The brake torque is transmitted between hub (3.0) and rotor (2.0) via the splines.

3.1.3 Brake release

In braked state, there is an air gap $s_{Lü}$ between stator (1.1) and armature plate (1.2). To release the brake, the stator coil (1.1) is excited with the DC voltage provided. The resulting magnetic force attracts the armature plate (1.2) towards the stator (1.1) against the spring load. The rotor (2.0) is released from the spring load and can rotate freely.



Technical data

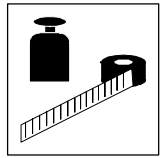
3.2 Rated data

Type	Brake torque rated value at $\Delta n=100\text{min}^{-1}$ M_K ¹⁾ [Nm]	Air gap $s_{Li} \pm 0,1$ [mm]		Tightening torque of the fixing screws [Nm]	Moment of inertial of the rotor [kg cm ²]	Brake mass [kg]	
		rated ²⁾	max.			Compact	Basic
INTORQ BFK457-01	0.12	0.1	0.35	0.7	0.00254	0.2	---
	0.25		0.23				
INTORQ BFK457-02	0.25	0.1	0.35	1.3	0.010	0.25	---
	0.5		0.23				
INTORQ BFK457-03	0.5	0.15	0.4	2.8	0.021	0.4	---
	1		0.3				
INTORQ BFK457-04	1	0.15	0.4	9.5	0.058	0.5	---
	2		0.3				
INTORQ BFK457-05	2	0.2	0.4	23.0	0.105	0.7	---
	4		0.3				
INTORQ BFK457-06	4	0.2	0.6	5.5	0.130	1.1	0.9
	6		0.4				
INTORQ BFK457-08	8	0.2	0.6	9.5	0.450	1.9	1.5
	12		0.45				
INTORQ BFK457-10	16	0.3	0.7	23.0	2.000	3.8	3.0
	23		0.5				
INTORQ BFK457-12	32	0.3	0.8	15.000	4.500	5.7	4.7
	46		0.5				
INTORQ BFK457-14	60	0.3	0.8	23.0	6.300	8.6	7.1
	90		0.5				
INTORQ BFK457-16	80	0.3	0.9	23.0	15.000	12.0	10.0
	125		0.6				

Type	Outer diameter [mm]	Pitch circle	
		\varnothing [mm]	weight
INTORQ BFK457-01	37	32	2 x M2.5
INTORQ BFK457-02	47	40	2 x M3
INTORQ BFK457-03	58	48	3 x M3
INTORQ BFK457-04	67	58	
INTORQ BFK457-05	77	66	3 x M4
INTORQ BFK457-06	84	72	3 x M5
INTORQ BFK457-08	102	90	3 x M6
INTORQ BFK457-10	130	112	3 x M8
INTORQ BFK457-12	150	132	
INTORQ BFK457-14	165	145	3 x M8
INTORQ BFK457-16	190	170	

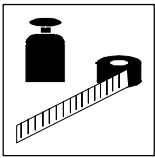
¹⁾ Minimum brake torque when all components are run in.

²⁾ Minimum air gap, effective value results from the sum tolerances of the single components.



Type	Electrical power P_{20} [W]	Voltage U [V]	Coil resistance R_{20} [Ω]			Brake torque rated value at $\Delta n=100\text{min}^{-1}$ M_K^1 [Nm]	Brake torque bei Δn_0 [Nm]			Maximum speed $\Delta n_{0\text{max}}$ [min^{-1}]
			Rated	Max.	Min.		1500	3000	max. horizontal	
INTORQ BFK457-01	5	24	115.3	121.1	109.5	0.12	0.11	0.10	0.09	12400
		205	8413	8833.7	7992.4					
INTORQ BFK457-02	6.6	24	87.3	91.7	82.9	0.25	0.23	0.21	0.18	
		205	6372	6690.6	6053.4					
INTORQ BFK457-03	9	24	64.0	67.2	60.8	0.5	0.45	0.42	0.35	
		205	5128	5384.4	4871.6					
INTORQ BFK457-04	11.5	24	50.1	52.6	47.6	1	0.89	0.82	1.34	
		205	4205	4415.3	3994.8					
INTORQ BFK457-05	13	24	44.3	46.5	42.1	2	1.76	1.62	1.34	
		205	3184.2	3343.4	3025					
INTORQ BFK457-06	20	24	28.8	30.24	27.36	4	3.5	3.2	2.6	
		205	2101	2269	1933					
INTORQ BFK457-08	28	24	20.57	21.6	19.54	8	6.8	6.2	5.3	
		205	1681	1807	1555					
INTORQ BFK457-10	30	24	19.2	20.16	18.24	16	13.3	12.2	10.6	
		205	1273	1356	1191					
INTORQ BFK457-12	40	24	14.4	14.83	13.97	32	25.9	23.7	21.1	
		205	1051	1082	1019					
INTORQ BFK457-14	50	24	11.52	11.87	11.17	60	48	43.8	40.2	
		205	764	787	741					
INTORQ BFK457-16	55	24	10.47	10.78	10.16	80	63.2	57.6	52.8	
		205	765	787	742					

1) Minimum brake torque when all components are run in.



Technical data

Type	Brake torque rated value at $\Delta n=100\text{min}^{-1}$ $M_K^{(1)}$ [Nm]	Friction work with one switching operation Q_E [J]	Transition frequency $S_{Hü}$ [h ⁻¹]	Switching times [ms] bei $S_{Lü}$ rated				Spark suppressor Order number
				DC engagement			Separation	
				t_{11}	t_{12}	t_1	t_2	
INTORQ BFK457-01	0.12	200	160	2	9	11	17	00045798 (24V, 42V) 00045801 (205V)
INTORQ BFK457-02	0.25	400	125	3	5	8	17	
INTORQ BFK457-03	0.5	800	100	5	7.5	12.5	18	
INTORQ BFK457-04	1	1200	90	9	9	18	23	
INTORQ BFK457-05	2	1800	80	10	16	26	35	
INTORQ BFK457-06	4	3000	79	29	19	48	37	
INTORQ BFK457-08	8	7500	50	60	35	95	42	
INTORQ BFK457-10	16	12000	40	35	60	95	100	
INTORQ BFK457-12	32	24000	30	45	53	98	135	
INTORQ BFK457-14	60	30000	28	50	57	107	240	
INTORQ BFK457-16	80	36000	27	71	50	121	275	

1) Minimum brake torque when all components are run in.

3.3 Switching times

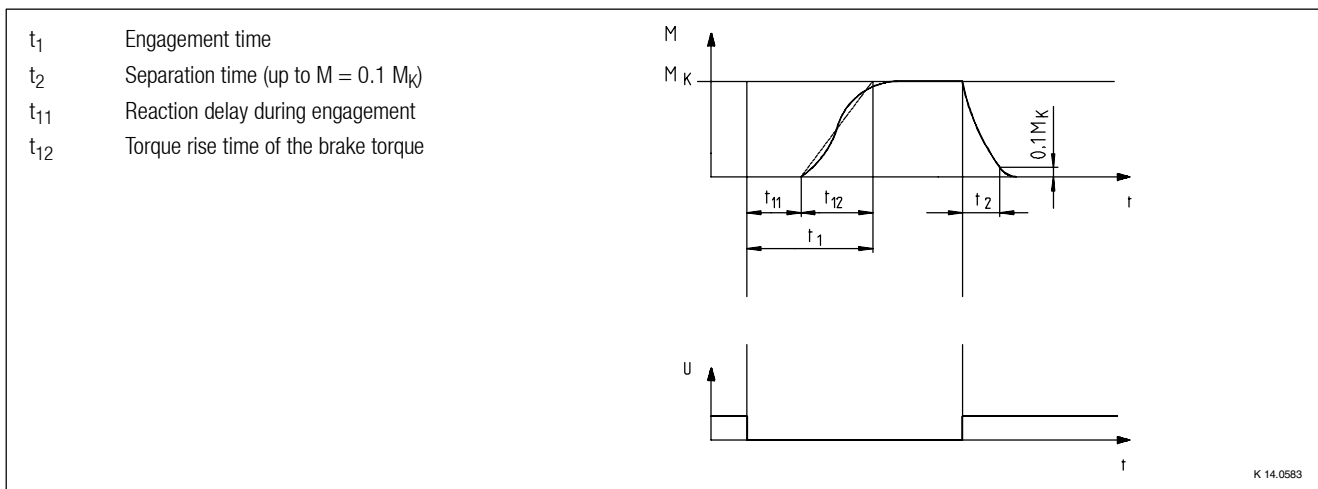
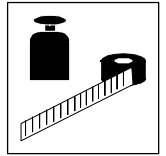


Fig. 3 Switching times

The transitions from the state without brake torque to the steady brake torque is not without delay. The engagement times are valid for switching on the DC side with an induction voltage of approx. 5 to 10 times rated voltage. The diagramme 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 .



Disengagement time:

The disengagement time is not influenced by DC or AC switching operations. It can only be shortened by special equipment for fast-response excitation or overexcitation.

Engagement time

With switching on the AC side, the engagement times are prolonged extremely. They are approx. 10 times longer, connection see Fig. 7.

With the simplest connection of rectifier and brake directly parallel to the motor winding, the engagement times are prolonged because the motor is switched off but still rotating so that the brake is excited further. For connection see Fig. 6.

For DC switching, spark suppressors or 24 V and 205 V rated voltage are available. These suppressors are to be connected in parallel to the contact. If, for safety reasons, for instance with lifting systems, this type of connection is not allowed, the spark suppressor can also be connected in parallel to the brake coil. For connection see Fig. 8.

3.4 Operating frequency / friction work

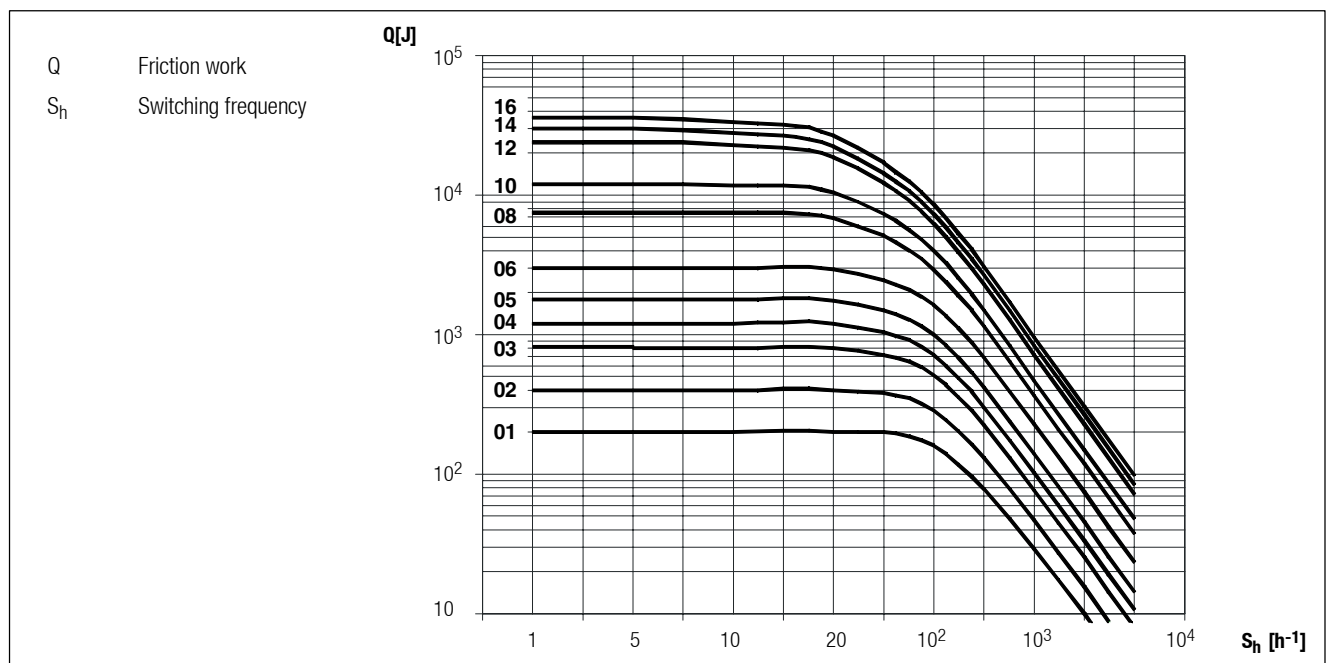
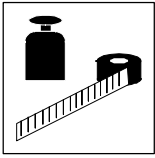


Fig. 4 Friction work as function of the operating frequency, size 01...16

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

The permissible operating frequency S_{hperm} depends on the friction work Q (see diagramme). 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.



Technical data

3.5 Emission

Electromagnetic compatibility

For normal circuits with unsmoothed DC voltage via bridge connection, the spring-applied brake INTORQ BFK457-□□ complies with thge electromagnetic compatibility EN50081 Teil 1.

Please note, that the entire circuit only complies with the EMC Directive, if it is configured according to one of the following possibilities:

Circuit:		Rectifier		Spark suppressor parallel to AC voltage	Mains filters
		complies with standard	does not comply with standard		
DC switching	< = 5 Switching operations / minute	●		●	
	> = 5 Switching operations / minute	●	●		●
AC switching	< = 5 Switching operations / minute	●	●	●	
	> = 5 Switching operations / minute	●	●	●	

Spark suppressor according to coil voltage on request.

Heat

Since the brake converts kinetic energy as well as mechanical and electrical work into heat energy, the surface heat depends on the operating conditions and the heat dissipation. Under unfavourable conditions, the surface temperature can reach 130°C.

Noises

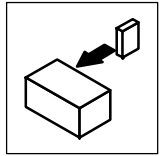
The switching noises during engagement and disengagement depend on the air gap “s_{LÜ}” and the brake size.

Depending on the natural oscillation after installation, operating conditions and state of the friction faces, the brake may squeak during braking.

Others

The abrasion of the friction parts produces dust.

With large loads, the friction face heats up so strongly, that odours may occur.





4 Installation

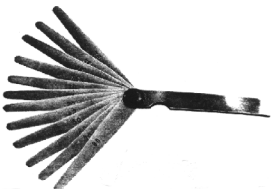
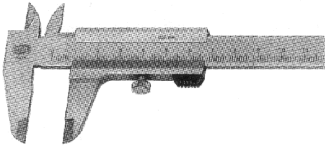
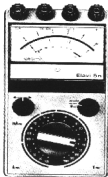


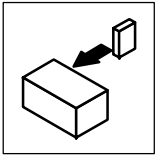
Warning!

Toothed hub or screws must not be lubricated with grease or oil!

4.1 Required tools

Type	Torque wrench Measuring range [Nm]	Insert for hexagon socket screws Opening [Inch]
		
INTORQ BFK457-01	0.3 - 4	2x1/4" square 50mm long
INTORQ BFK457-02		2.5x1/4" square 50mm long
INTORQ BFK457-03		
INTORQ BFK457-04		3x1/4" square 55mm long
INTORQ BFK457-05		
INTORQ BFK457-06	0.5 - 13	3x1/4" square 55mm long
INTORQ BFK457-08		4x1/4" square 55mm long
INTORQ BFK457-10	3 - 40	5x1/2" square 180mm long
INTORQ BFK457-12		
INTORQ BFK457-14	20 - 100	6x1/2" square 140mm long
INTORQ BFK457-16		

Feeler gauge	Caliper gauge	Multimeter
		



Installation

4.2 Assembly

4.2.1 Preparation

1. Unpack spring-applied brake.
2. Check for completeness
3. Check nameplate data, especially rated voltage.

4.3 Installation

4.3.1 Installation of the hub onto the shaft



Stop!

Square hubs must be used for the sizes 01 and 02!

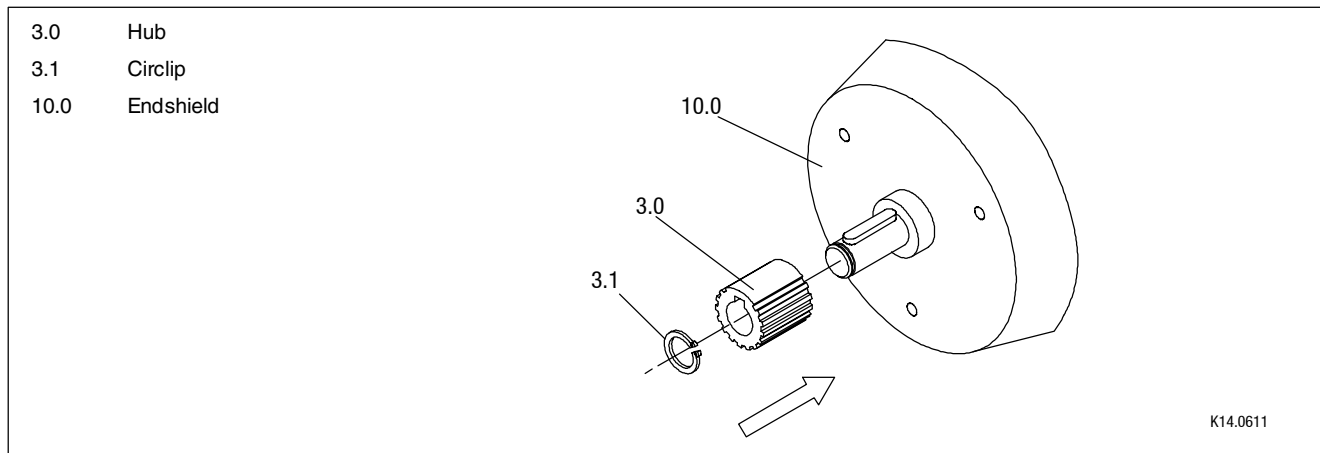
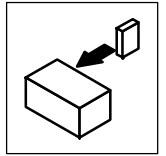


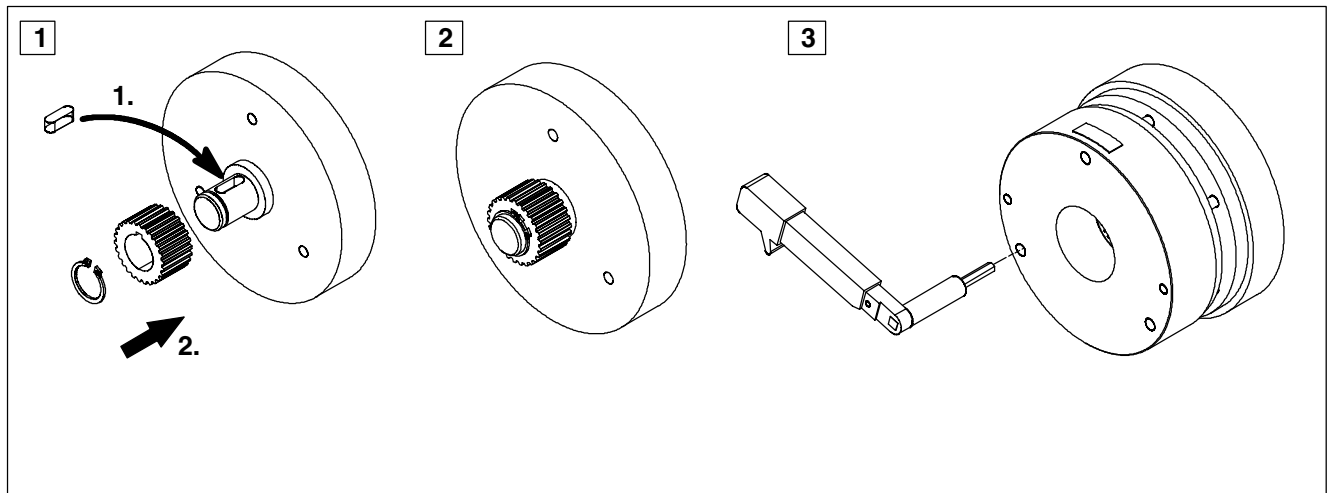
Fig. 5 Installation of the hub onto the shaft

1. Press hub (3.0) onto the shaft.
2. Secure hub against axial displacement (e.g. using a circlip - 3.1).

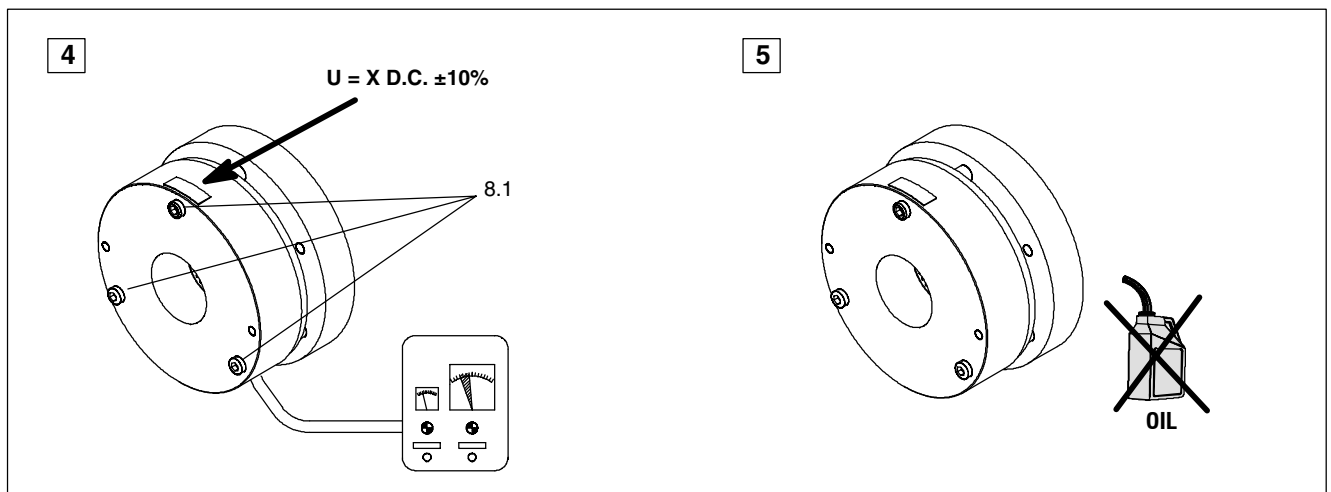


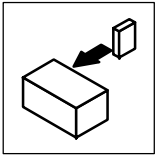
4.3.2 Installation of the brake INTORQ BFK457-01...16, compact design

1. Hub (3.0) installation, chapter 4.3.1.
2. Push spring-applied brake (1.0) onto the hub (3.0). Secure hub against axial displacement (e.g. using a circlip - 3.1).
3. Bolt the spring-applied brake (1.0) to the endshield using the fixing screws (8.1).



4. Tighten the screws (8.1) evenly (for torques see the table Rated data, chapter 3.2).

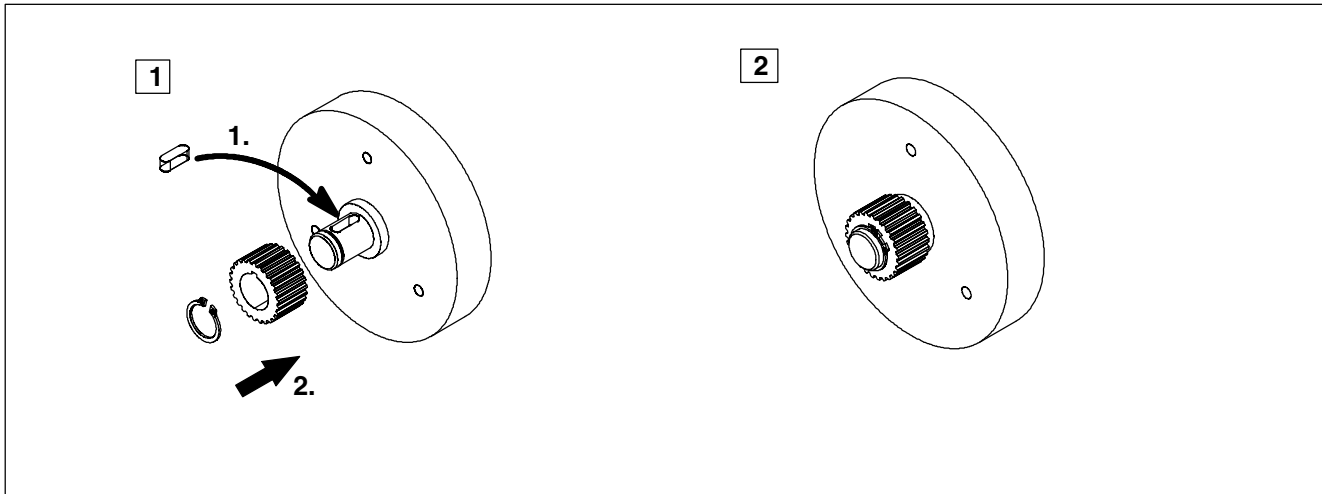




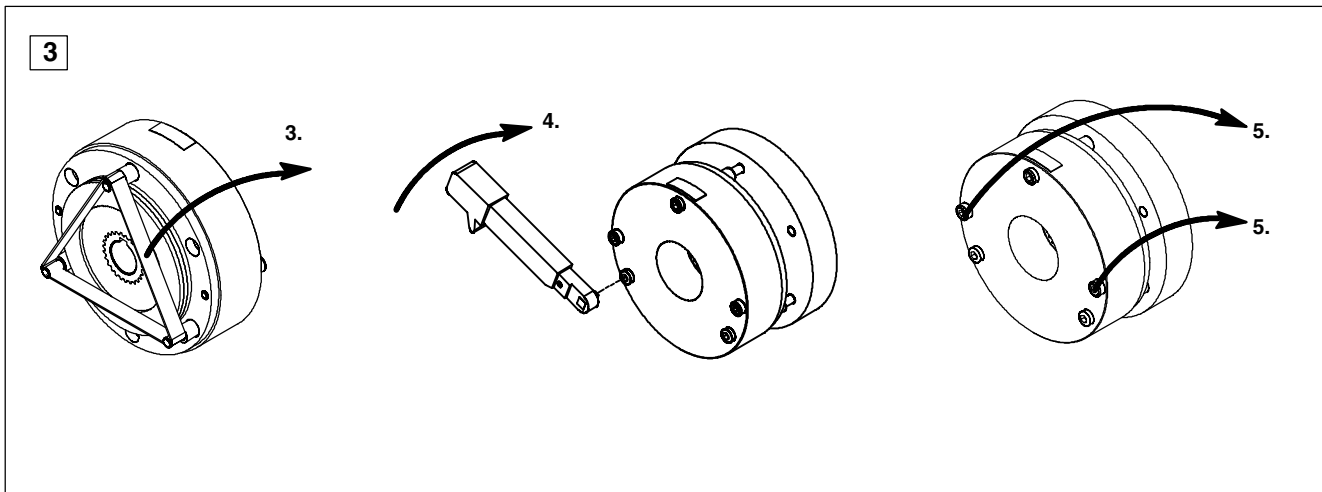
Installation

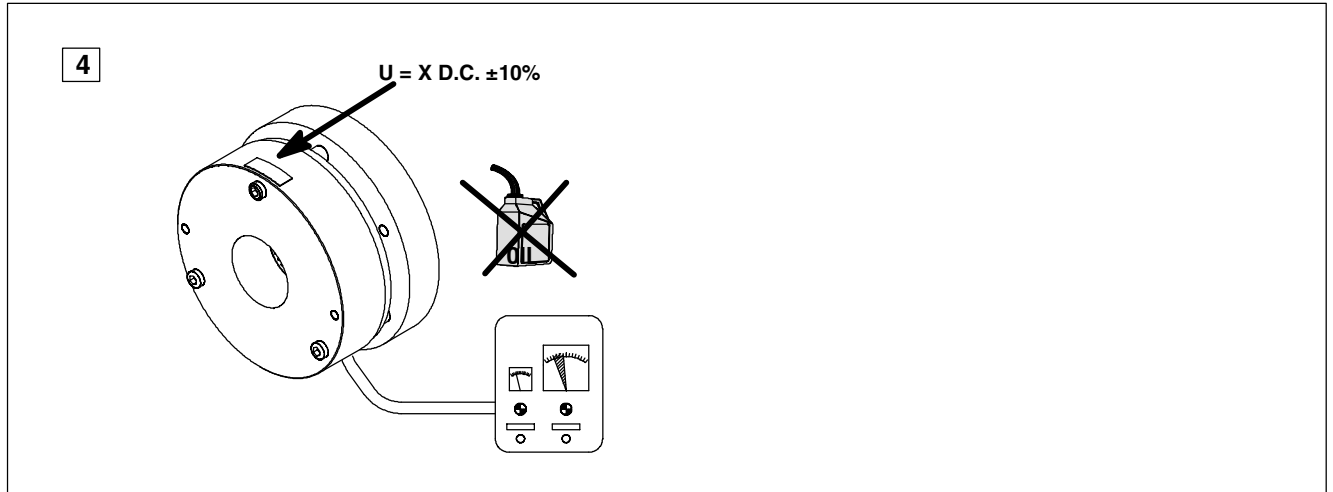
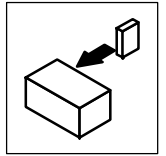
4.3.3 Installation of the brake INTORQ BFK457-06...16, basic design

1. Mount the hub (3.0), chapter 4.3.1
2. Push the spring-applied brake onto the hub (3.0), secure the hub against axial displacement with a circlip (3.1).



3. Tighten the brake fixing screws lightly and remove the shipping brace (elastic band).
4. Tighten the screws (8.1) evenly (for torques see the table Rated data, chapter 3.2).
5. Remove the cheese head screws.





4.4 Electrical connection



Warning!

The brake must only be electrically connected when no voltage is applied.

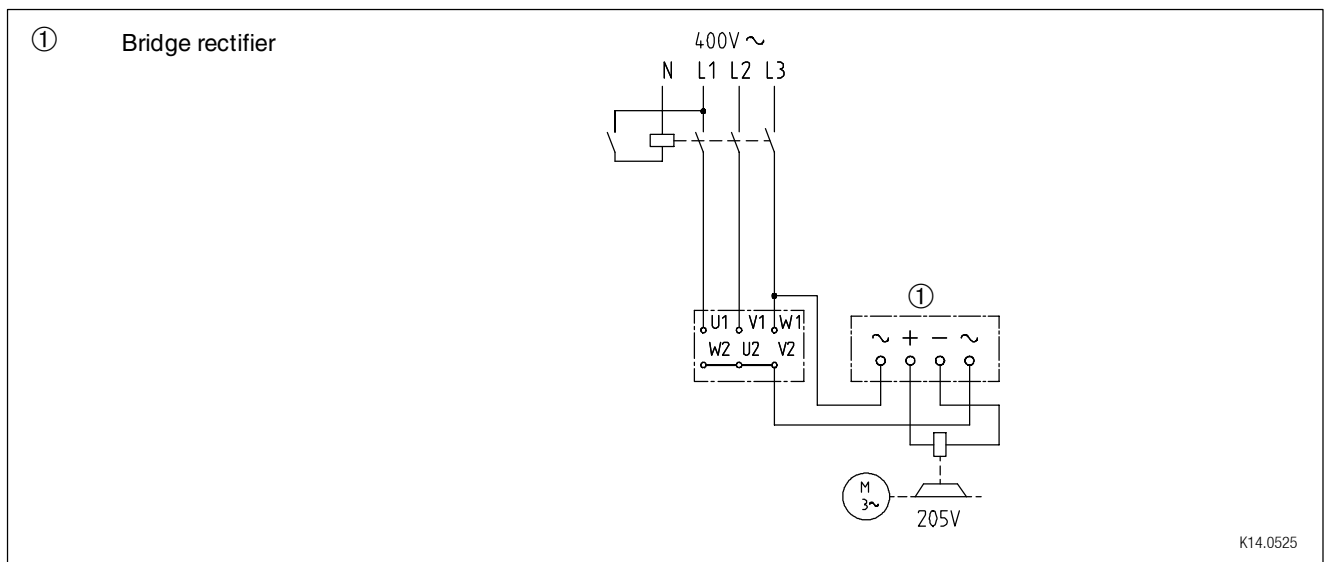
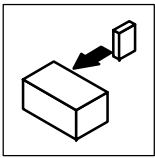


Fig. 6 Switching parallel to motor, extremely delayed engagement



Installation

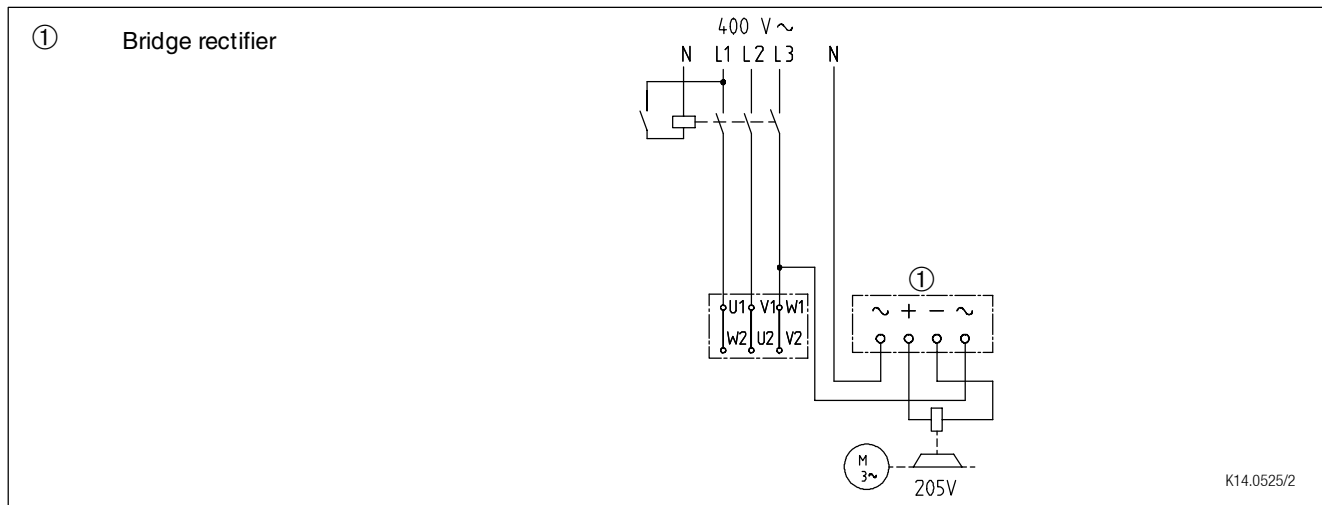


Fig. 7 DC switching, delayed engagement

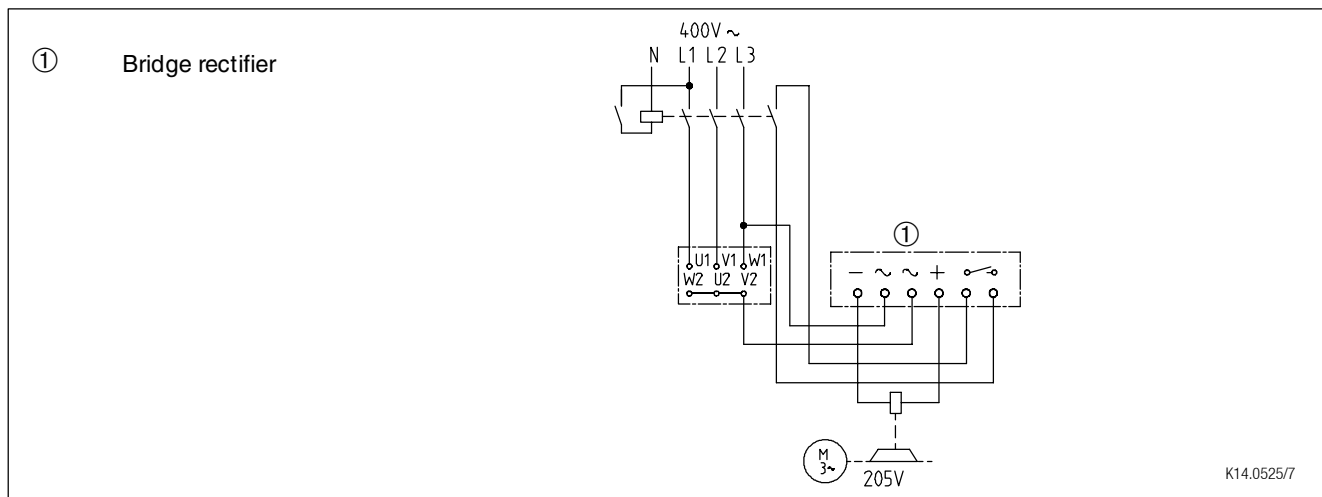


Fig. 8 DC switching, normal engagement

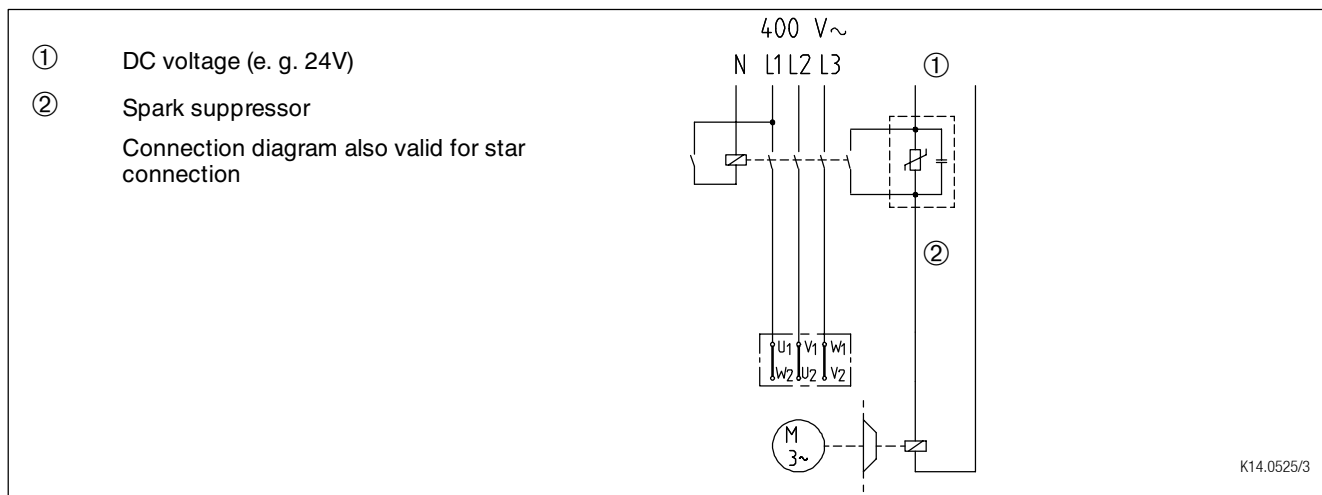
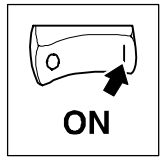


Fig. 9 Separated DC voltage, DC switching.



5 Commissioning and operation



Warning!

Live connections must not be touched.
The motor must not be connected when checking the brake.

5.1 Operational test

In the events of faults see chapter 7 Troubleshooting and elimination.

5.1.1 Release / voltage check



Warning!

The brake must be free of torque. The motor must not rotate.



Warning!

Live connections must not be touched.

1. Remove two bridges from the motor terminals. Do not switch of the DC brake supply. When connecting the rectifier to the star point of the motor, the PEN conductor must also be connected at this point.
2. Switch on the current.
3. Measure the DC voltage at the brake.
4. Compare the DC voltage with the voltage indicated on the nameplate. A 10% deviation is permissible.
5. The air gap must be zero and the rotor must rotate freely.
6. Switch off the current.
7. Bolt bridges to the motor terminals. Remove additional PEN conductor.

5.2 During operation

- Check the brake regularly during operation. Take special care of:
 - unusual noises and temperatures
 - loose fixing elements
 - the state of the cables.
- In the event of failures, refer to the trouble shooting table in chapter 7. If the fault cannot be eliminated, please contact the INTORQ representative.



6 Maintenance / repair

6.1 Inspection intervals

The wear of the friction lining of the rotor depends of the operating conditions. The running time of the brake depends on the friction work per switching operation and on the differential speed. The inspection intervals must be adapted to the operating conditions and can be prolonged if the brake shows minimum wear.

6.2 Inspections

6.2.1 Inspection of brake INTORQ BFK457-01...16

6.2.1.1 Air gap



Warning!

The motor must be at standstill when checking the air gap.

1. Measure the air gap " $s_{L\u0304}$ " between armature plate and stator using a feeler gauge.
2. Compare the measured air gap with the maximum permissible air gap " $s_{L\u0304max}$ ". (See table Rated Data, chapter 3.2).
3. If necessary, replace the rotor.

6.2.1.2 Releasing / voltage



Warning!

The running rotor must not be touched.



Warning!

Live connections must not be touched.

1. Observe air gap " $s_{L\u0304}$ " during operation of the drive. It must be zero.
2. Measure DC voltage at the brake during operation. The voltage must be the same as indicated on the nameplate. A 10% deviation is permissible.



6.3 Maintenance

6.3.1 Maintenance of brake INTORQ BFK457-01...16



Warning!

Switch off the voltage. The brake must be free of residual torque.

1. Loosen connection cable.
2. Unbolt fixing screws and remove brake from endshield. Observe connection cable.
3. Pull rotor from hub.
4. Check hub splining. In the event of wear, replace hub.
5. Check rake function according to the description of the inspection given in chapter 6.2.1.
6. If necessary, install new brake.

6.4 Spare-parts list

Only parts with order numbers available.

The order numbers are only valid for standard versions.

- Bore diameter in mm
- Standard keyway to DIN 6885/1 P9

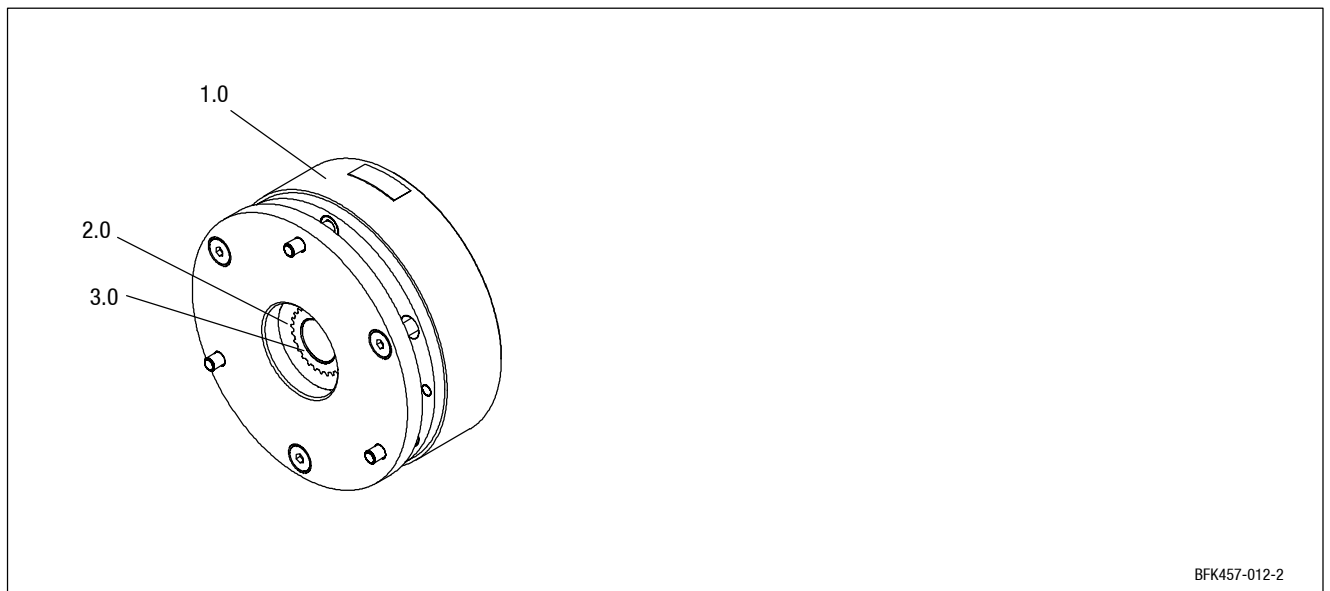
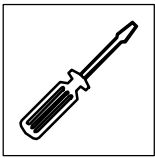


Fig. 10 Spare parts for spring-applied brakes INTORQ BFK Size 01...16

Pos.	Name	Variant				
		Size	Voltage	Brake torque	Basic	Compact
1.0	Spring-applied brake	Size	Voltage	Brake torque	Basic	Compact
2.0	Rotor	Size	----	----	----	----
3.0	Hub	Size	Bore	----	----	----



Maintenance

6.5 Order of spare parts

Receiver:

INTORQ GmbH & Co. KG

31849 Aerzen

Fax no.: +49 51 54 / 95 39-10

Spring-applied brake INTORQ BFK457-□□

Sender

Company _____

Customer no. _____

Street/P.O.box _____

Order no. _____

Postal code / City _____

Issuer _____

Delicery address * _____

Phone _____

Fax _____

Invoice addressee* _____

Date of delivery _____

Date _____

Signature _____

* Please indicate, if different from sender

Order quantity
INTORQ BFK457

Price/item _____

Size

01 02 03 04 05

Compact: completely mounted with rotor and flange

06 08 10 12 14 16

Compact: completely mounted with rotor and flange

Basic: Stator complete with rotor

Voltage

24V 205V 42V (Size 14 and 16)

Brake torque

	01	02	03	04	05	06	08	10	12	14	16
<input type="checkbox"/>	0.12	0.25	0.5	1	2	4	8	16	32	60	80
<input type="checkbox"/>	0.25	0.5	1	2	4	6	12	23	46	90	125

Order quantity

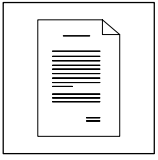
_____ bore diameter in mm (see Technical Data, Catalogue)

Price in EURO / item - Germany: plus VAT

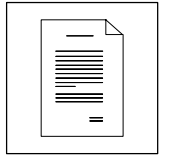


7 Troubleshooting and fault elimination

Fault	Cause	Remedy
Spring-applied brake does not release, air gap is not zero	Coil is interrupted	<ul style="list-style-type: none"> Measure the coil resistance using a multimeter: <ul style="list-style-type: none"> If the resistance is too high, replace the spring-applied brake.
	Coil has contact to ground or between the windings	<ul style="list-style-type: none"> Measure the coil resistance using a multimeter: <ul style="list-style-type: none"> Compare measured resistance to rated resistance. For values see chapter 3.2 Rated data. If the resistance is too low, replace the spring-applied brake. Check coil for contact to ground using a multimeter: <ul style="list-style-type: none"> In case of contact to ground, replace the spring-applied brake. Check brake voltage (see defective rectifier, voltage too low).
	Wiring wrong or defective	<ul style="list-style-type: none"> Check and correct wiring. Check cable for continuity using a multimeter: <ul style="list-style-type: none"> Replace defective cable.
	Rectifier defective or wrong	<ul style="list-style-type: none"> Measure DC voltage at the rectifier using a multimeter: <ul style="list-style-type: none"> If DC voltage is zero: <ul style="list-style-type: none"> Measure AC voltage at the rectifier. If AC voltage is zero: <ul style="list-style-type: none"> Apply voltage, check fuse, check wiring If AC voltage is o.k.: <ul style="list-style-type: none"> Check rectifier, replace defective rectifier If DC voltage is too low: <ul style="list-style-type: none"> Check rectifier, Use half-wave rectifier instead of bridge rectifier. If diode is defective, use suitable new rectifier Check coil for contact to ground or between the phases. If a rectifier defect occurs more than once, replace the spring-applied brake even if a contact to ground or between the windings cannot be measured. The fault may occur only in the warm state.
	Air gap too large	<ul style="list-style-type: none"> Spring-applied brake INTORQ BFK457-01...16, replace the rotor.
Rotor thickness too small	Spring-applied brake was not replaced in time	Replace spring-applied brake (chapter 4.3.1 and 4.3.2).
Voltage too high	Brake voltage does not match with rectifier	Adapt rectifier and brake voltage to each other.
Voltage too low	Brake voltage does not match with rectifier	Adapt rectifier and brake voltage to each other.
	Defective rectifier diode	Replace rectifier by a suitable new one.
AC voltage is not mains voltage	Fuse missing or defective	Select connection where fuse has not been removed and is o.k.



Notes





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