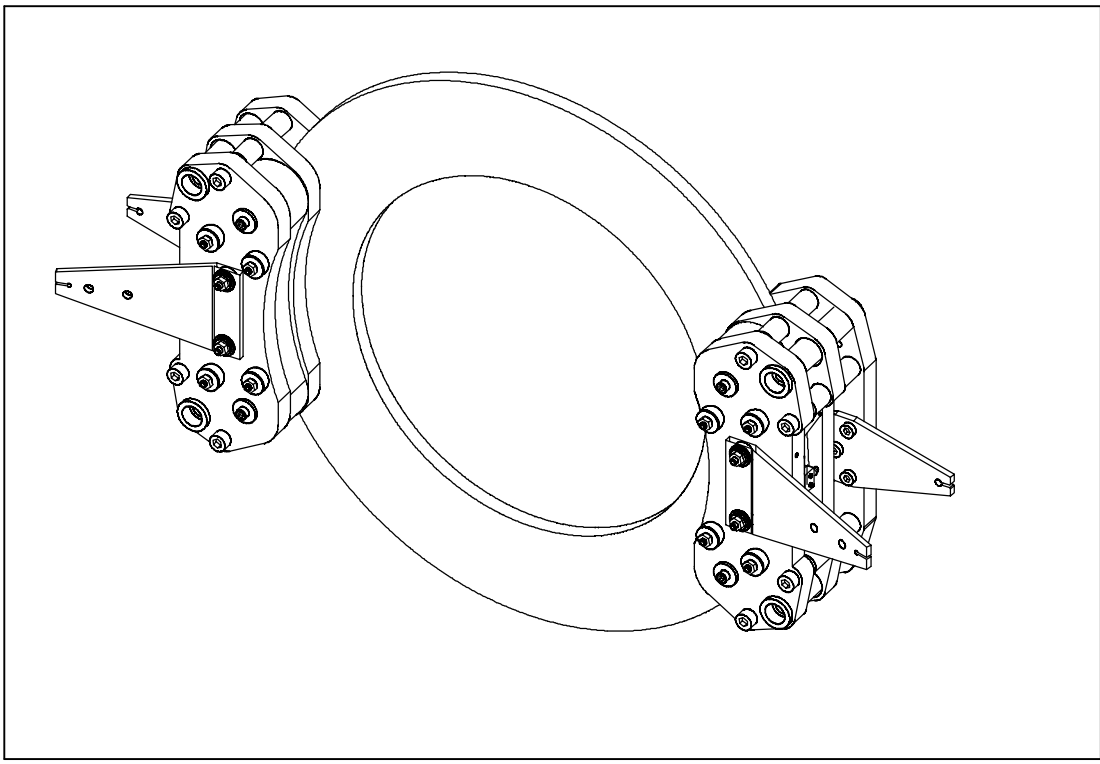
BA 14.0177
13054724 EN

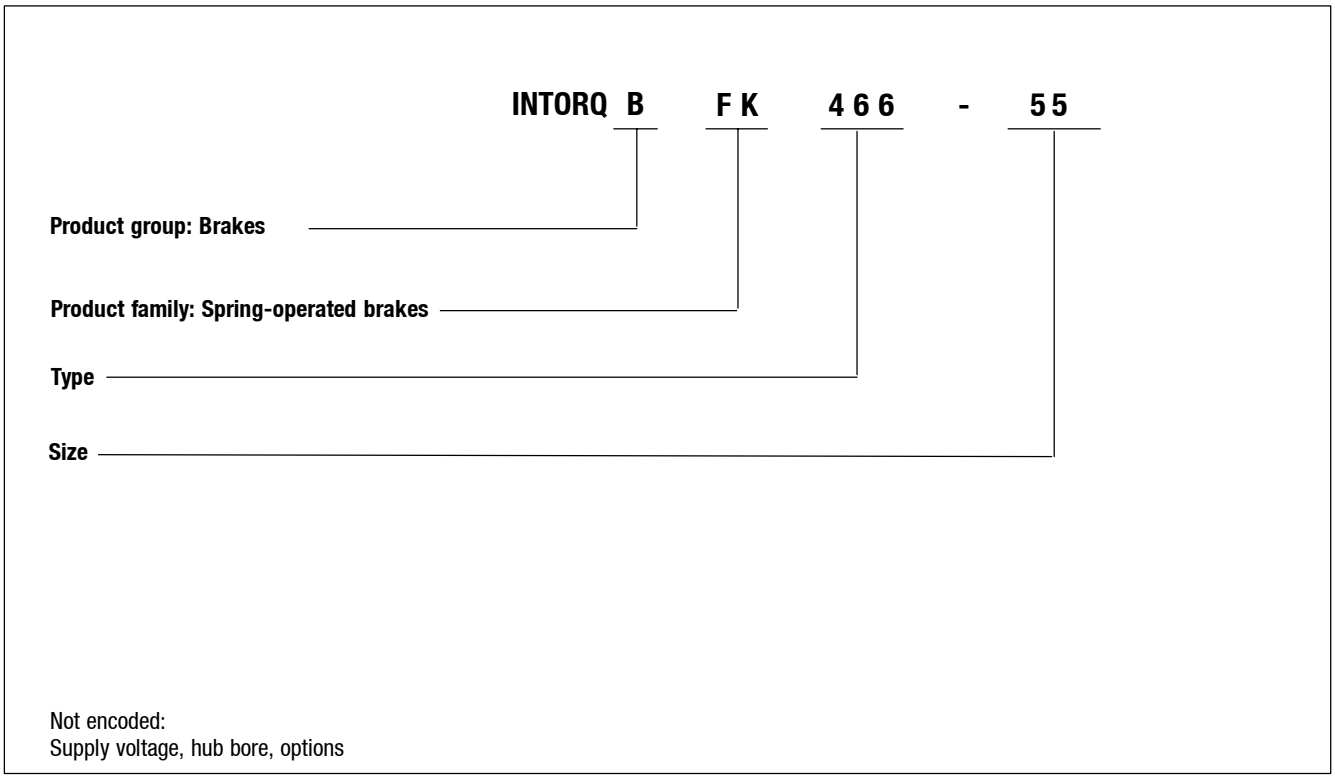
INTORQ

Operating Instructions



Multi-pole spring-operated brake INTORQ BFK466-55

Product key



- The specifications in the product key, nameplate, and packaging sticker are valid for the multi-pole spring-operated brakes INTORQ BFK466-55.

These Operating Instructions are valid for the following multi-pole spring-operated brakes:

INTORQ BFK466-55

Nameplate

Layout for sizes 55

Field	Content			Example
1	Manufacturer		CE labelling	INTORQ D - Aerzen CE BFK466-55 0036 ABV 715/1 230 V AC 473/118 W XX XXXX Nr.: 00461628 925 NM 23.05.05
2	Brake type		Model identification	
3	Rated voltage	Rated power	Desired customer no.	
4	Type no.	Rated braking torque	Date of manufacture	

Packaging sticker

Layout

Field	Content				Example
1	Manufacturer			Barcode no.	INTORQ D - Aerzen Typ: BFK466-55 Nr. 00461628 FEDERKRAFTBREMSE 1 Stück 230 V AC 473/118 W 925NM 23.05.05 0036 ABV 715/1 XX XXXX CE Rostschutzverpackung-Reibfläche fettfrei halten
2	Brake type			Type no.	
3	Type see product key			Qty per box	
4	Rated voltage	Rated power	Rated braking torque	Date of packaging	
5	Model identification			Desired customer no..	
	Supplement			CE labelling	

What is new / what has changed ?

Material number	Edition	Important	Content
00 471 894	1.0 07/2003 TD09 /TD14	1st edition	First edition for series
00000000	2.0 06/2005 TD09/TD14	2nd edition Replaces 00471894	Change of company name to INTORQ The chapter ”Troubleshooting and fault elimination” has been supplemented by ”Air gap too small”.

Contents

1 Preface and general information 6

1.1 About these Operating Instructions 6
1.1.1 Terminology used 6
1.2 Items supplied 6
1.3 Drive systems 7
1.3.1 Labelling 7
1.3.2 Application as directed 7
1.3.3 Legal regulations 7

2 Safety information 8

2.1 Personnel responsible for safety 8
2.2 General safety information 8
2.3 Layout of the safety information 9

3 Technical data 10

3.1 Product description 10
3.1.1 General 10
3.1.2 Braking 11
3.1.3 Release 11
3.1.4 Emergency release 11
3.1.5 Release monitoring 11
3.2 Rated data 11
3.3 Operating times 12
3.4 Switching frequency / switching work 13
3.5 Emissions 13

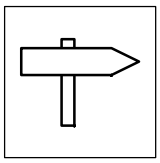
4 Installation 14

4.1 Necessary tools 14
4.2 Assembly 15
4.2.1 Preparation 15
4.3 Installation procedure 15
4.4 Electrical connection 16

5 Commissioning and operation 17

5.1 Operating test 17
5.1.1 Release / voltage control 17
5.1.2 Hand release 17
5.2 During operation 18

Contents



6 Maintenance/repair 19

6.1 Inspection intervals 19

6.2 Inspections 19

6.3 Maintenance 19

6.4 Spare parts order 20

7 Troubleshooting and fault elimination 21

1 Preface and general information

1.1 About these Operating Instructions ...

- These Operating Instructions inform about safety-relevant working on and with multi-pole spring-operated brakes. They contain all safety information which must be observed.
- All persons working on or with the multi-pole spring-operated brakes must have these Operating Instructions available and observe the information and notes relevant for their work.
- 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-operated brake” is used for multi-pole spring-operated brakes.

Drive system

The term ”drive system” will be used for drive systems with spring-operated brakes and other drive components.

1.2 Items supplied

- The spring-operated brakes are delivered preassembled. The brake disc and the mounting screws are not included in the scope of supply.
- After receipt of the delivery, check immediately whether the items delivered match the accompanying papers. INTORQ does not grant any warranty for deficiencies claimed subsequently. Claim
  – visible transport damage immediately to the forwarder.
  – visible deficiencies/incompleteness immediately to your INTORQ representative.

1.3 Drive systems

1.3.1 Labelling

- Drive systems and components are clearly labelled and defined by the indications on the nameplates.
- Manufacturer:
  INTORQ GmbH & Co. KG.
  Postbox 11 03 — Wülmser Weg 5
  D-31849 Aerzen — D-31855 Aerzen

1.3.2 Application as directed

- Drive systems
  – are to be used in machines and systems.
  – are only to be used for the ordered and acknowledged application conditions.
  – must only be operated under the conditions prescribed in these Instructions.
  – must not be used at powers higher or lower than indicated in these Instructions.

Any other use shall be deemed as 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 on modifications referring to controllers which have already been supplied cannot be derived from the information, illustrations, and descriptions.
- We does not accept any liability for damage and operating interference caused by:
  – inappropriate use
  – unauthorised modifications to the drive system
  – improper working on and with the controller
  – operating errors
  – disregarding these Instructions

Warranty

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

2 Safety information

2.1 Personnel responsible for safety

Operators

- An operator is any natural or legal person who uses the spring-operated brake or on whose behalf the spring-operated brake is used.
- The operator or the safety personnel must ensure
  – that all relevant regulations, instructions, notes and laws will be maintained.
  – that only qualified personnel works on and with the spring-operated brake,
  – that the Operating Instructions are always available
  – that unqualified personnel is not allowed to work on and with the spring-operated brake.

Qualified personnel

Qualified personnel are persons who, because of their training, experience and knowledge of all applicable standards and regulations as well as of all operating circumstances, have been entitled by the person responsible for the system to work on and with the system and to see and avoid all possible dangers.
(Definition for qualified personnel to IEC 364)

2.2 General safety information

- These safety notes do not claim to be complete. If any questions or problems occur, please contact your INTORQ representative.
- The spring-operated brakes met the state of the technology at the time of delivery and are generally safe to operate.
- Spring-operated brakes endanger persons, the spring-operated brakes themselves and other properties of the user if
  – unqualified personnel works on and with spring-operated brakes.
  – spring-operated brakes are used inappropriately.
- Spring-operated brakes must be planned in a way that if correctly installed and used for their designed purpose in fault-free operation, their function is fulfilled and no risk to persons arises. This also applies to clutches and brakes integrated into a drive system.
- Operate the spring-operated brake only when it is in perfect condition.
- Retrofittings, modifications or changes of the spring-operated brake are generally forbidden. In any case, INTORQ GmbH & Co. KG. must be contacted before.
- The friction lining and the friction surfaces must by no means have contact to oil or grease since even small amounts reduce the brake torque considerably.
- The brake torque will usually not be influenced if the brake is used under the environmental conditions that apply to IP54. Because of the numerous possibilities of using the brake it is however necessary to check the functionality of all mechanical components under the corresponding application conditions.

Application range of the INTORQ BFK466-55 spring-operated brake:

- No potentially-explosive or aggressive atmosphere.
- Humidity, no restrictions.
- Ambient temperature -20°C to +40°C.
- At high humidity and low temperatures
  – Take measures against freezing of the friction lining and brake disc.
- Protect the electrical connections against contact.

2.3 Layout of the safety information

- All safety instructions given in these Operating Instructions have got the same structure:

Signal word!

Note

– The icon characterizes the type of danger.
– The signal word characterizes the severity of danger.
– The note describes the danger and gives information how to prevent dangerous situations.

Warning of danger to persons

Icons used	Signal words	
 Warning of dangerous electrical voltage	**Danger!**	Warns of **immediately impending danger** . Consequences if disregarded: Death or most serious injuries.
	Warning!	Warns of a **potentially very dangerous situation**. Possible consequences if disregarded: Death or most serious injuries.
 Warning of a general danger	**Caution!**	Warns of a **potentially hazardous situation**. Possible consequences if disregarded: light or minor injury.

Warning of danger to material/s

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

Other information

Icons used	Signal words	
	**Tip!**	Denotes a general useful tip. If you observe it, handling of the drive system/device will be easier.

3 Technical data

3.1 Product description

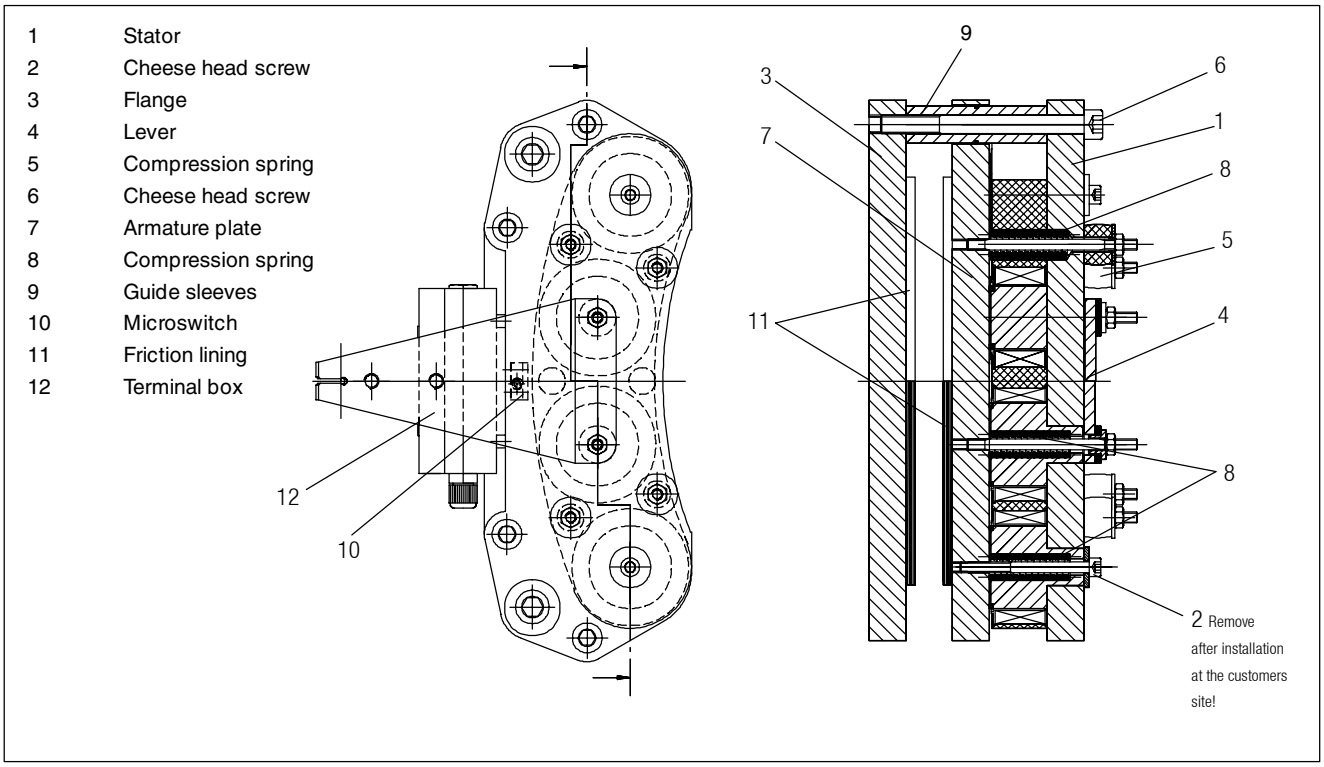


Fig. 1 Design of a INTORQ BFK466-55 spring-operated brake with noise damping

3.1.1 General

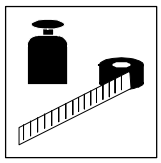
The INTORQ BFK466-55 spring-operated brake is designed as a floating caliper for mounting on direct drive motors. The brake disc is not included in the scope of supply. By using two or more spring-operated brakes on one brake disc the demand for redundancy can be fulfilled for special applications as lift and stage technology.

The brake torque is generated by the pressure of several compression springs (8) via friction locking between both friction linings (11) of the armature plate (7) and flange (3) and the brake disc. The brake is released electromagnetically. The suitable switching device rectifies the supply voltage (AC voltage) and decreases it after a short time when the brake is released. Thus a reduction of the medium electrical brake power is reached. As an option, the switching device can be installed into the terminal box.

The INTORQ BFK466 spring-operated brake is designed for converting mechanical work and kinetic energy into heat energy at running speeds up to 12m/s. Thanks to the static breakaway torque loads can be held without speed difference.

Emergency braking at higher speeds is possible. Here, the maximum permissible speed (see chapter 3.2) must not be exceeded.

The stator (1) is designed to be of thermal class F. The limit temperature of the coils is 155°C.



3.1.2 Braking

During braking the armature plate (7) with the affixed friction lining is pressed against the axially fixed brake disc. Nearly at the same time the caliper moves on the guide sleeves (9) in the opposite direction, so that the friction lining on the flange (3) is pressed against the brake disc, too. The braking torque depends on how strong the guide sleeves (9) are tightened to the mounting flange. The asbestos-free friction linings ensure a high brake torque with low wear.

3.1.3 Release

When the brake is applied, there is an air gap "$s_{Lü}$" between the armature plate (7) and the pole faces of the stator". The switching device supplies the coils of the stator (1) with DC voltage to release the brake. The resulting magnetic force draws the armature plate (7) against the spring force towards the pole faces of the stator (1). The caliper can move on the guide sleeves (9) until the brake disc (2) is relieved and can rotate freely again.

3.1.4 Emergency release

Optionally a hand release (4) is available for short-term release of the brake. It serves to lower the load in the event of a power failure.

3.1.5 Release monitoring

The INTORQ BFK466 spring-operated brake is equipped with a microswitch (changeover contact) which monitors the switching state. During the brake release the microswitch (10) changes over. This means that the operation of the drive against the closed brake can be excluded.

3.2 Rated data

Type	Rated torque M_{rated} [Nm]	Brake disc diameter d_a [mm]	Voltage 1) a [V] DC	Power 2) P_{20} [W]	Coil resistance R_{20} ±5% [Ω]	Max. current I_{max} [A]	Air gap $s_{Lü\ rated}$ [mm]	Max. air gap $s_{Lü\ max.}$ [mm]
INTORQ BFK466-55	730	450	205	473 / 118	88.80	2.31	0.4 ±0.1	1.0
INTORQ BFK466-55	925	550						
INTORQ BFK466-55	1270	750						

Type	Max. speed $r_{max.}$ [min^{-1}]	Fixing screws	Tightening torque M_a [NM]	max. perm. switching work Q_E [J]	Transition operating frequency $S_{hü}$ [h^{-1}]	Weight (without brake disc) m [kg]
INTORQ BFK466-55	500	2 x M12 - 10.9	115	24000	30	16.8
INTORQ BFK466-55	400					
INTORQ BFK466-55	300					

1) With inverter 230V AC installed into terminal box

2) Coil power at 20°C when releasing / holding

3.3 Operating times

t_1 Engagement time
t_2 Disengagement time (up to M = 0.1 M_K)
t_{11} Reaction delay of engagement
t_{12} Rise time of brake torque

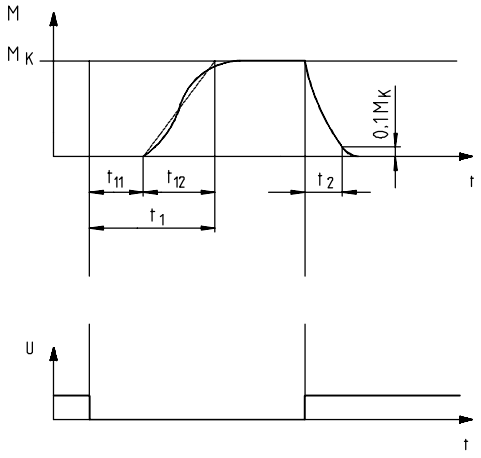


Fig. 2 Operating times

Type	Switching times [ms] at $s_{Lürated}$			
	Engaging			Disengaging
	t_{11}	t_{12}	t_1	t_2
INTORQ BFK466-55	13	20	33	60

The transition from a state free of braking torque to one of steady braking torque is not immediate. The engagement times apply to switching on the DC side with a spark suppressor at induction voltages of approx. 5 to 10 times of rated voltage. The diagram (Fig. 2) shows the response delay during engagement t_{11}, the rise time of the brake torque t_{12} and the engagement time $1_1 = t_{11} + t_{12}$, and the disengagement time t_2.

Disengagement time:

The disengagement time is not affected by DC or AC switching.

Engagement time

Short engagement times are absolutely necessary for emergency braking. DC switching together with a suitable spark suppressor must therefore be provided.

If the drive system includes a frequency inverter so that the brake is de-energised only when the motor is at standstill, switching on the AC side is also possible (not valid for emergency braking). In this case, engagement times will be five times longer.

3.4 Switching frequency / switching work

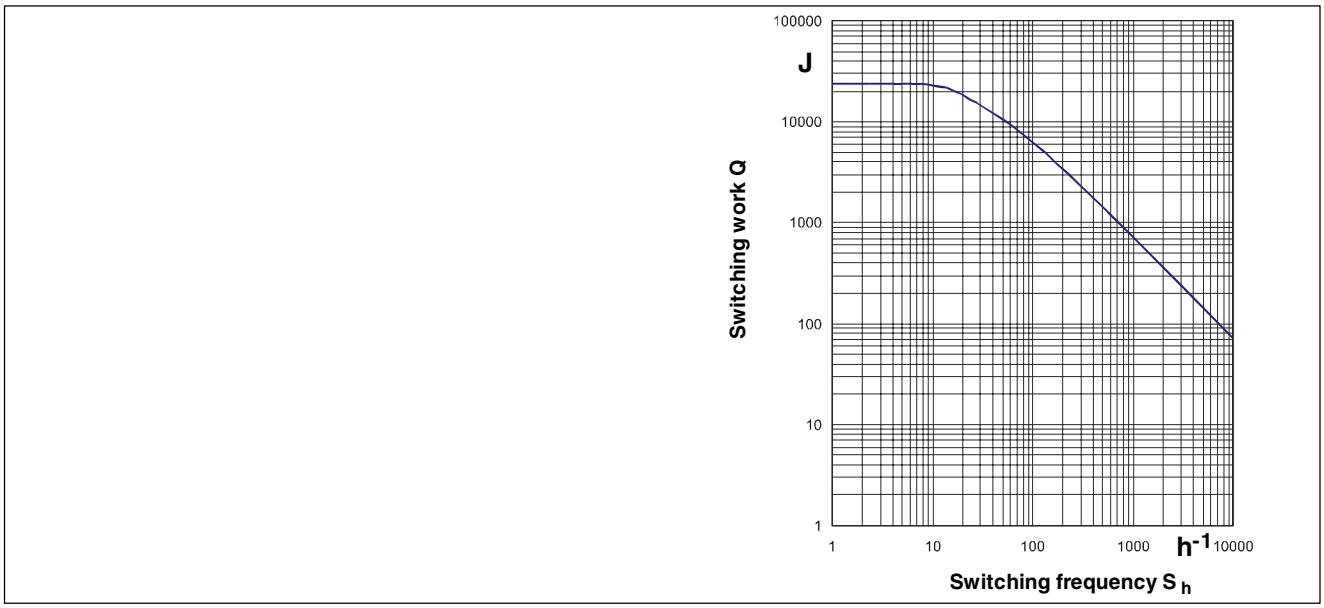


Fig. 3 Switching work as a function of switching frequency INTORQ BFK466-55

The permissible switching frequency "S_{hperm}" depends on the switching work Q.

$$S_{hzul} = \frac{-S_{hü}}{\ln\left(1-\frac{Q}{Q_E}\right)}$$

At a preset switching frequency "S_h" the permissible switching work is "Q_{perm}".

$$Q_{zul} = Q_E\left(1 - e^{\frac{-S_{hü}}{S_h}}\right)$$

3.5 Emissions

Heat

As the brake converts kinetic energy as well as mechanical and electrical work into heat, the surface becomes hot depending on the operating conditions and possible heat dissipation. Under unfavourable operating conditions, a surface temperature of 130°C can be reached.

Noises

The switching noise during engagement and disengagement varies dependent on the air gap "$s_{Lü}$". It is between approx. 60 to 65 db (A).

Others

The abrasion from emergency stop braking will be visible as dust.

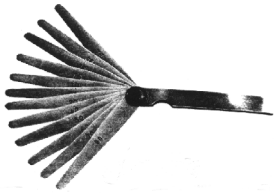
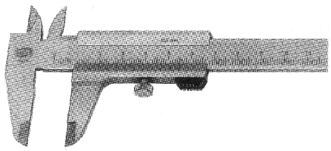
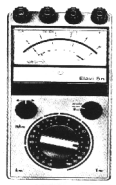
In case of high load the friction faces will become so hot that odour nuisance may occur.

4 Installation

Warning!
Do not lubricate the screws with oil or grease.

4.1 Necessary tools

Type	Torque wrench Measuring range [Nm]	Hexagon socket screws Spanner width	Transport screw	Crosstip screwdriver
INORQ BFK466-55	120	10 x 1/2” square	5 x 1/4” square	

Feeler gauge	Caliper gauge	Multimeter
		

4.2 Assembly

4.2.1 Preparation

1. Unpack spring-operated brake
2. Check the delivery package for completeness
3. Check the nameplate data, especially the rated voltage

4.3 Installation procedure

The brake is delivered preassembled with two transport screws (1) Fig. 4.

1. Position the brake radially over the brake disc (2).
2. Insert mounting screws (3) and tighten with the torque given (chapter 3.2).
3. Check the clearance of the brake disc (2) and the air gap "$s_{Lü}$" between both friction linings (4) and brake disc (2) with feeler gauge (5).

STOP

Stop!

The total sum of the distances measured must not exceed the value of "$s_{Lü}$"$_{max.}$!

4. Remove transport screws (1).
5. Switch the current on and off several times, checking the movability of the brake on the guide sleeves.

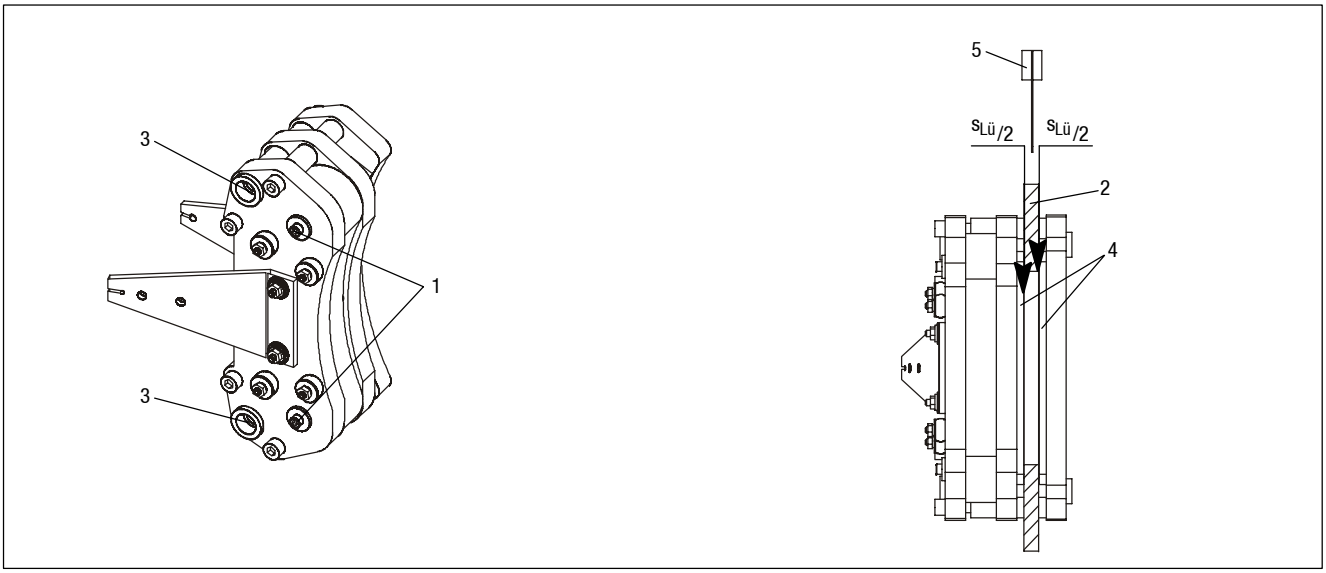


Fig. 4 INTORQ BFK 466-55

4.4 Electrical connection

Warning!

Make electrical connection only when no voltage is applied.

If an “emergency stop” is carried out without the protective circuit provided, the control device may be destroyed. Observe correct polarity of the protective circuit!

Switch on

- K2 must be closed prior to K1!

Switch off

- Normal (switching on the AC side)
  - K2 remains closed
  - Open K1
- Emergency stop (switching on the DC side)
  - K1 and K2 are opened at the same time

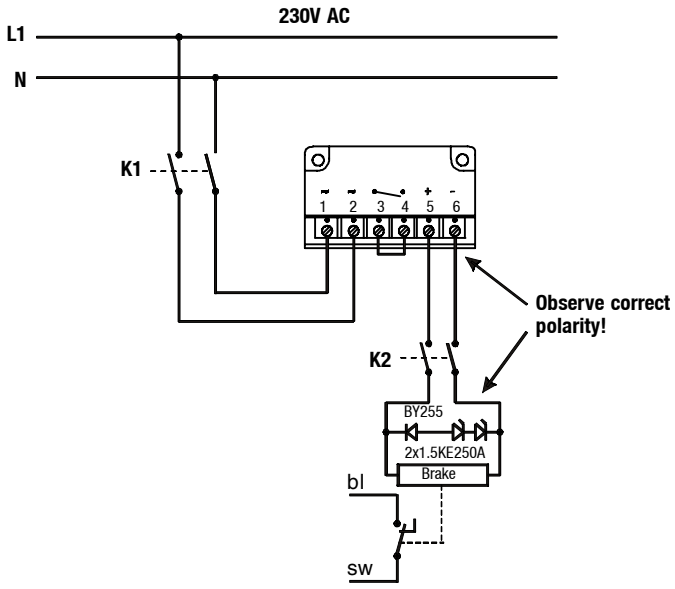


Fig. 5 INTORQ BFK466 terminal diagram (proposed connection for switching on the DC side)

- Input connection: black
- NO contact: blue connection
- NC contact: grey connection

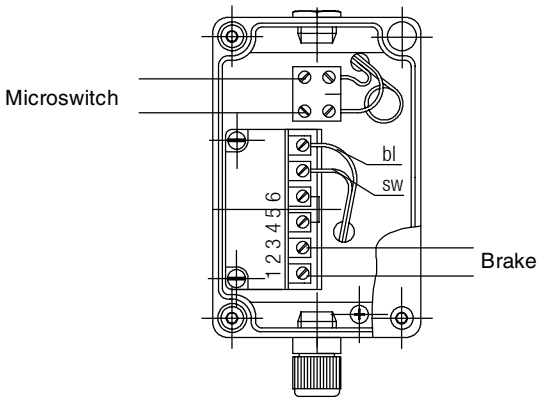
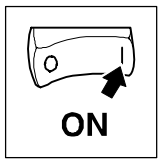


Fig. 6 INTORQ BFK466 terminal box

When current is fed to the spring-operated brake the armature plate is released. The microswitch (NO contact) is actuated and gives the signal “Spring-operated brake released”.



5 Commissioning and operation

5.1 Operating test

Warning!

The brake torque must be zero. The motor must not run!

Live connections must not be touched!

In the event of errors see chapter 7 Troubleshooting and fault elimination.

5.1.1 Release / voltage control

1. Remove two bridges from the motor terminals. Do not switch off the voltage supply for the brakes.
2. Measure the AC voltage at the motor terminals. It must be zero.
3. Switch on the current for the brake.
4. Measure the AC voltage at the motor terminals. It must be equal to the mains voltage.
5. Control the air gap "$s_{Lü}$" between the brake disc and friction lining. Altogether it must amount to 0.4±0.1 mm. The brake disc must rotate freely.
6. Turn off the power supply.
7. Screw the bridges onto the motor terminals.

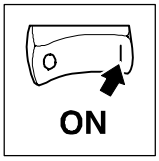
5.1.2 Hand release

The mounted hand release is designed for operation via Bowden cable. The support at the spring-operated brake serves to hang up the Bowden cable. For operation without a Bowden cable the lever must be extended to a total length of approx. 500 mm.

Warning!

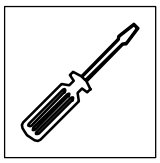
The brake must be free of torque. The motor must not run!

1. Pull at the lever with approx. 800 N (with extension approx. 200 N) until the resistance rises sharply.
2. The rotor must rotate freely. A small residual torque is permissible.
3. Release the lever.



5.2 During operation

- Checks must be carried out regularly. Please observe particularly:
  – Unusual noises and temperatures
  – Loose fixing elements
  – The state of the electrical cables.
- In the event of faults see the table ”troubleshooting” in chapter 7. If a fault cannot be eliminated, please contact the INTORQ representative.



6 Maintenance/repair

6.1 Inspection intervals

The spring-operated brake is to be checked during the prescribed inspections of the drive system in which it is installed.

The service life of the brake before replacement does not only depend on the number of emergency brakings. The wear of the brake friction linings depend on the operating conditions. The possible overall friction work before a replacement is necessary will be less with many switchings.

6.2 Inspections

1. Torque / delay check

Warning!

Disconnect the drive from the load to prevent accidents. During the next inspection steps of the spring-operated brake, the motor must not run!

2. Switch on the current for the brake.
3. Control the air gap "$s_{Lü}$" between brake disc and friction lining with feeler gauge. It must not exceed the maximum permissible air gap "$s_{Lü\ max.}$" according to the table in chapter 3.2.
4. Turn off the power supply.

6.3 Maintenance

Under the application conditions as a holding brake, the brake does not require any maintenance. Exchanging the brake is made in reverse order of assembly (chapter 4.2).

Warning!

Disconnect the drive from the load to prevent accidents. During further working steps on the spring-operated brake the motor must not run!

1. Switch on the current for the brake **or** screw in transport screws (M6x65 with washer Ø23).
2. Undo mounting screws at the guide sleeves (Fig. 1).
3. Remove brake radially from the brake disc.
4. Switch off the power supply and disconnect the connecting cables.

6.4 Spare parts order

Consignee: **INTORQ GmbH & Co. KG**
Postfach 11 03
D-31849 Aerzen
Fax: ++49 (0) 51 54 - 95 39 - 10

INTORQ BFK466-55 spring-operated brake

Consignor

Company _____ Customer no. _____

Street / POB _____ Order no. _____

Postcode / town _____ Issued by _____

Delivery address * _____ Telephone no. _____

_____ Telefax no. _____

Invoice recipient* _____

Delivery date _____

Date _____ Signature _____

*Please state if different to consignee

Order quantity _____pcs.

Size ☐ **55**

Voltage ☐ **103V** ☐ **205V**

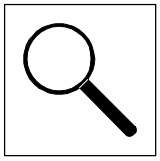
Cable length _____ ☐ **Standard**
mm from 100 mm - 1000 mm in 100 mm steps,
from 1000 mm - 2500 mm in 250 mm steps)

Hand release ☐ **mounted**

Terminal box ☐ **mounted**

Electrical accessories

Rectifier with overexcitation ☐

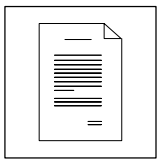


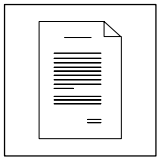
7 Troubleshooting and fault elimination

Error	Cause	Remedy
Brake cannot be released, air gap is not zero	Coil is interrupted	• Measure the coil resistance with a multimeter: – Exchange brake when resistance is too high.
	Fault between turns or short circuit to ground	• Measure the coil resistance with a multimeter: – Compare the measured resistance with the rated resistance. The rated data is given in chapter 3.2. Exchange brake when resistance is too low. • Test the coil for short circuit to ground using a multimeter. – Exchange brake in case of short circuit to ground. • Check the brake voltage (see defective rectifier, voltage too low).
	Defective or wrong wiring	• Check and correct wiring. • Check the cable using a multimeter: – Replace a defective cable
	Defective or wrong rectifier	• Measure the DC voltage at the rectifier using a multimeter. DC voltage is zero: • Measure the AC voltage at the rectifier AC voltage is zero: – Switch on the voltage. – Check the fusing. – Check the wiring. AC voltage is ok: – Check the rectifier. – Replace defective rectifier DC voltage is too low: – Check the rectifier. – Defective diode, use appropriate rectifier • Check the coil for fault between turns and short circuit to ground • If the rectifier defect occurs again, replace the brake even if you cannot find any fault between turns or short circuit to ground. The defect may occur later during heating up.
	Wrong wiring of microswitch	Check and correct the microswitch wiring
	Wrong setting of microswitch	Replace the brake and complain about the microswitch quality at the manufacturer
	Air gap too big	Replace brake (chapter 6.3).
Brake disc cannot rotate freely	Wrong setting of manual release	Check the dimension $s+s_{Lü}$ when brake is life. The dimensions must be the same on both sides. If necessary, correct it.
	Air gap "$s_{Lü}$" too small	• Control the air gap "$s_{Lü}$" and, if necessary, replace the brake (chapter 6.3). • Thickness of the brake disc must be controlled and, if necessary, brake disc must be replaced. • Check the movability of the brake on the guide sleeves and, if necessary, replace the guide sleeves.
Voltage is not zero during functional test, chapter 5.1	Wrong wiring of microswitch	Check and correct wiring of microswitch.
	Microswitch defective or set incorrectly	Brake must be replaced and defect brake must be sent to manufacturer.

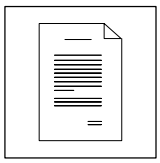
Troubleshooting and fault elimination

Voltage too high	Brake voltage does not match the rectifier	Adapt brake voltage to rectifier
Voltage too low	Brake voltage does not match the rectifier	Adapt brake voltage to rectifier
	Diode in rectifier defective	Replace the rectifier by suitable, undamaged rectifier
AC voltage is not mains voltage	Defective or missing fuse	Select connection with proper fusing
	Wrong wiring of microswitch	Check and correct wiring of microswitch.
	Microswitch defective or set incorrectly	Brake must be replaced and defect brake must be sent to manufacturer.





Notes



INTORQ – sales and service worldwide

Hersteller
Head Office

INTORQ GmbH & Co. KG
Postfach 1103
D-31849 Aerzen
Wülmser Weg 5
D-31855 Aerzen
Telefon +49 (0)5154 / 95 39-01
Telefax +49 (0)5154 / 95 39-10
E-mail: info@intorq.de
http://www.intorq.de

Kundendienst / Service

Lenze Drive Systems GmbH
Extertal-Bösingfeld
Breslauer Straße 3
D-32699 Extertal
Telefon +49 (0)5154 / 82-12 15
Telefax +49 (0)5154 / 82-11 12

Der Vertrieb erfolgt über die Lenze-Vertriebsorganisation

Sales are organized by Lenze's sales department

Deutschland
Germany

Lenze Vertrieb GmbH
Ludwig-Erhard-Straße 52-56
D-72760 Reutlingen
Telefon +49 (0)71 21 / 9 39 39-0
Telefax +49 (0)71 21 / 9 39 39-29

Region Nord
Dornenpark 1
31840 Hessisch Oldendorf
Telefon (0 51 52) 90 36-0
Telefax (0 51 52) 90 36-33/44/55

Region West
Postfach 10 12 20
47497 Neukirchen-Vluyn
Kelvinstraße 7
47506 Neukirchen-Vluyn
Telefon (0 28 45) 95 93-0
Telefax (0 28 45) 95 93 93

Region Mitte/Ost
Postfach 1463
35724 Herborn
Austraße 81
35745 Herborn
Telefon (0 27 72) 95 94-0
Telefax (0 27 72) 5 30 79

Region Südwest
Postfach 14 33
71304 Waiblingen
Schänzle 8
71332 Waiblingen
Telefon (0 71 51) 9 59 81 - 0
Telefax (0 71 51) 9 59 81 50

Region Süd
Fraunhoferstraße 16
82152 Martinsried
Telefon (0 89) 89 56 14-0
Telefax (0 89) 89 56 14 14

weltweit
worldwide

ALGERIA
see FRANCE

ARGENTINA
E.R.H.S.A.
Girardot 1368
1427 BUENOS AIRES
Phone +54 (0)11 / 45 54 32 32
Telefax +54 (0)11 / 45 52 36 11

AUSTRALIA
FCR Motion Technology Pty. Ltd.
Unit 6, Automation Place
38-40 Little Boundary Rd.
Leverton North
3026 MELBOURNE, VIC.
Phone +61 (03) 9362 6800
Telefax +61 (03) 9314 3744

AUSTRIA
Lenze Antriebstechnik GmbH
Ipf-Landesstraße 1
4481 ASTEN
Phone +43 (0)7224 / 21 0-0
Telefax +43 (0)7224 / 21 09 99

Office Dornbirn:
Lustenauer Straße 64
6850 DORNBIRN
Phone +43 (0)5572 / 26 789-0
Telefax +43 (0)5572 / 26 789-66

Office Wr. Neudorf:
Triester Straße 14/109
2351 WR. NEUDORF
Phone +43 (0)2236 / 2 53 33-0
Telefax +43 (0)2236 / 2 53 33-66

Office Graz:
Seering 8
8141 UNTERPREMSTÄTTEN
Phone +43 (0)3135 / 56 900-0
Telefax +43 (0)3135 / 56 900 999

Lenze Verbindungstechnik GmbH
Ipf-Landesstraße 1
4481 ASTEN
Phone +43 (0)7224 / 21 1-0
Telefax +43 (0)7224 / 21 19 98

Lenze Anlagentechnik GmbH
Mühlenstraße 3
4470 ENNS
Phone +43 (0)7223 / 886-0
Telefax +43 (0)7223 / 886-997

BELGIUM
Lenze b.v.b.a
Noorderlaan 133, bus 15
2030 ANTWERPEN
Phone +32 (0)3 / 54 26 20 0
Telefax +32 (0)3 / 54 13 75 4

BOSNIA-HERZEGOVINA
see AUSTRIA

BRAZIL
AC Control Ltda
Rua Gustavo da Silveira 1199
Vila Sta. Catarina
SÃO PAULO – S.P.
04376-000
Phone +55 (11) 55 64 65 79 ramal: 214
Telefax +55 (11) 56 79 75 10

BULGARIA
see MACEDONIA

CANADA
see USA

CHILE
Sargent S.A.
Tecnica Thomas C. Sargent
S.A.C.é.I., Casilla 166-D
SANTIAGO DE CHILE
Phone +56 (0)2 / 51 03 000
Telefax +56 (0)2 / 69 83 989

CHINA
Lenze Mechatronic Drives (Shanghai)
Co. Ltd., Section B, 50# building,
No.199 North Ri Ying Road,
Waigaoqiao Free Trade Zone
SHANGHAI, 200131
Phone +86-21-5046 0848
Telefax +86-21-5046 0850

Beijing Office
Rm. 401, Huaxin Mansion
No. 33 An Ding Road, Chaoyang District
BEIJING 100029
Phone +86-10-6441 1470
Telefax +86-10-6441 1467

CROATIA
Lenze Antriebstechnik GmbH
Predstavnista Zagreb
Ulica Grada Gospica 3
HR-1000 ZAGREB
Phone +385-1-2 49 80 56
Telefax +385-1-2 49 80 57

CZECH REPUBLIC
Lenze, s.r.o.
Central Trade Park D1
396 01 HUMPOLEC
Phone +420 565 507-111
Telefax +420 565 507-399

Büro Červený Kostelec:
17. listopadu 510
549 41 ČERVENÝ KOSTELEC
Phone +420 491 467-111
Telefax +420 491 467-166

DENMARK
Lenze A/S
Vallensbækvej 18A, 2605 BRØNDBY
Phone +45 / 46 96 66 66
Telefax +45 / 46 96 66 60
24 stunde service +45 / 40 93 04 11

Buero Jylland:
Lenze A/S, Enebærvej 11
8653 THEM
Phone +45 / 46 96 66 66
Telefax +45 / 46 96 66 80

EGYPT
WADI Co. for technologies
and development
P.O.Box 209, new center Ramses
11794 CAIRO, Egypt
11 Syria St., Mohandessin
GIZA, Egypt
Phone +20 (2) 347 6842
Telefax +20 (2) 347 6843

ESTONIA
see FINLAND

FINLAND
Lenze Drives
Rykmentintie 2 b, 20810 TURKU
Phone +358 2 2748 180
Telefax +358 2 2748 189

FRANCE
Lenze S.A.
Siege
Z.A. de Chanteloup
Rue Albert Einstein
93603 AULNAY-SOUS-BOIS CEDEX

Services Commerciaux
Tel. 0 825 086 036
Fax 0 825 086 346

Centre de formation
E-Mail : semin.sidonie@lenze.fr

Questions générales / Documentation
E-Mail : info@lenze.fr

Service Après-vente / assistance en ligne
Helpline 24/24 : 0 825 826 117
E-Mail:helpline@lenze.fr

Agences en France
Région France Nord :
Z.A. de Chanteloup
Rue Albert Einstein
93603 AULNAY-SOUS-BOIS CEDEX

Lille
59420 MOUVAUX

Strasbourg
67960 ENTZHEIM

Rouen
76500 ELBEUF

INTORQ – sales and service worldwide

Région France Sud :
Rond point du sans souci
69578 LIMONEST Cedex

Toulouse
31400 TOULOUSE

Agen
47270 SAINT-PIERRE DE CLAIRAC

GREECE
George P. Alexandris S.A.
12K. Mavromichali Str.
185 45 PIRAEUS
Phone +30 (0)210 / 41 11 84 15
Telefax +30 (0)210 / 4 11 81 71
4 12 70 58
183 Monastiriou Str.
546 27 THESSALONIKI
Phone +30 (0)310 / 5 56 65 04
Telefax +30 (0)310 / 51 18 15

HUNGARY
Lenze Antriebstechnik
Handelsgesellschaft mbH
2040 BUDAÖRS
Gyár utca 2., P.O.Box 322.
Phone +36 (0)23 / 501-320
Telefax +36 (0)23 / 501-339

ICELAND
see DENMARK

INDIA
Electronic Service:
National Power Systems,
10, Saibaba Shopping Centre
Keshav Rao Kadam Marg,
Off Lamington Rd,
MUMBAI 400 008
Phone +91 22 / 2300 5667, 2301 3712
Telefax +91 22 / 2300 5668

V3 Controls Pvt. Ltd.
1, "Devyani", Next to SBI,
Baner ITI Road, Sanewadi, Aundh,
PUNE 411 007, MS
Phone +91 20 / 25 88 68 62
Telefax +91 20 / 25 88 03 50

Mechanical Service:
Emco Lenze Pvt. Ltd.
1st Floor, Sita Mauli
Madanlal Dhingra Road
Panch Pakhadi, Thane (West)
MAHARASHATRA 400 602
Phone +91 22 / 25 40 54 88
+91 22 / 25 45 22 44
Telefax +91 22 / 25 45 22 33

INDONESIA
P.T. Futurindo Globalsatya
Jl.: Prof. Dr. Latumenten No. 18
Kompleks Perkantoran
Kota Grogol Permai Blok A 35
JAKARTA 11460
Buero 1:
Phone +62 (0)21 / 766 42 34
765 86 23
Telefax +62 (0)21 / 766 44 20

Buero 2:
Phone +62 (0)21 / 567 96 31
567 96 32
Telefax +62 (0)21 / 566 87 50

IRAN
Tavan Ressan Co. Ltd.
P.O.Box. 19395-5177
No. 44, Habibi St.,
South Dastour St.,
Sadr EXP'Way,
TEHRAN 19396
Phone +98 21 / 260 26 55
260 67 66
260 92 99
Telefax +98 21 / 200 28 83

ISRAEL
Greenshpon Engineering Works LTD
Bar-Lev Industrial Park
MISGAV 20179
Phone +972 4 99 13 18 1
Telefax +972 4 99 13 47 7

ITALY
Gerit Trasmissioni S.p.A.
Viale Monza 338, 20128 MILANO
Phone +39 02 / 270 98.1
Telefax +39 02 / 270 98 290

JAPAN
Miki Pulley Co., Ltd.
1-39-7 Komatsubara, Zama-city
KANAGAWA 228-8577
Phone +81 (0)462 / 58 16 61
Telefax +81 (0)462 / 58 17 04

LATVIA
see LITHUANIA

LITHUANIA
Lenze UAB
Breslaujos g.3, 44403 KAUNAS
Phone +370 37 407174
Telefax +370 37 407175

LUXEMBOURG
see BELGIUM

MACEDONIA
Lenze Antriebstechnik GmbH
Pretstavnistvo Skopje
ul. Nikola Rusinski 3/A/2
1000 SKOPJE
Phone +389 2 30 90 090
Telefax +389 2 30 90 091

MALAYSIA
D.S.C. Engineering SDN BHD
3A & 3B, Jalan SS21/56B
Damansara Utama
47400, PETALING JAYA
SELANGOR
Phone +60 (0)3 / 77 25 62 43
77 25 62 46
77 28 65 30
Telefax +60 (0)3 / 77 29 50 31

MAURITIUS
Automation & Controls Engineering Ltd
3, Royal Road
Le Hochet, Terre Rouge
MAURITIUS
Phone +230 248 8211
Telefax +230 248 8968

MEXICO
Automatización y Control
de Energía S.A. de C.V.
Av. 2 No. 89 Esq Calle 13
Col. San Pedro de los Pinos
C.P. 03800 MEXICO D.F.
Phone +52 (55)5277/5998
Telefax +52 (55)5277/5937

MOROCCO
GUORFET G.T.D.R
Automatisation Industrielle
Bd Chefchaouni Route 110 km, 11.500
No. 353-Aîn-Sabaâ
CASABLANCA
Phone +212/22-35 70 78
Telefax +212/22-35 71 04

NETHERLANDS
Lenze B.V., Postbus 31 01
5203 DC`S-HERTOGENBOSCH
Ploegweg 15
5232 BR`S-HERTOGENBOSCH
Phone +31 (0)73 / 64 56 50 0
Telefax +31 (0)73 / 64 56 51 0

NEW ZEALAND
Tranz Corporation
343 Church Street
P.O. Box 12-320, Penrose
AUCKLAND
Phone +64 (0)9 / 63 45 51 1
Telefax +64 (0)9 / 63 45 51 8

NORWAY
Dtc- Lenze as
Stallbakken 5, 2005 RAELINGEN
Phone +47 / 64 80 25 10
Telefax +47 / 64 80 25 11

PHILIPPINES
Jupp & Company Inc.
Unit 224 Cityland Pioneer Bldg.,
Pioneer Street
MANDALUYONG CITY
Phone +63 2 / 687 7423
683 0042
683 0047
Telefax +63 2 / 687 7421

POLAND
Lenze-Rotiw Sp. z o.o.
ul. Roździeńskiego 188b
40-203 KATOWICE
Phone +48 (0)32 / 2 03 97 73
Telefax +48 (0)32 / 7 81 01 80

Lenze Systemy Automatyki Sp. z o.o.
Ul. Rydygiera 47
87-100 TORUŃ
Phone +48 (0)56 / 6 58 28 00
6 45 34 60
6 45 35 70
Telefax +48 (0)56 / 6 45 33 56

PORTUGAL
Costa Leal el Victor
Electronica-Pneumatica, Lda.
Rua Prof. Augusto Lessa, 269,
Apart. 52053
4202-801 PORTO
Phone +351-22 / 5 50 85 20
Telefax +351-22 / 5 02 40 05

ROMANIA
see AUSTRIA

RUSSIA
Inteldrive
1 Buhvostova Street 12/11
Korpus 18, Office 322
MOSCOW 107258
Phone +7 (0)095 / 963 96 86
Telefax +7 (0)095 / 962 67 94

SERBIA-MONTENEGRO
see MACEDONIA

SINGAPORE
see MALAYSIA

SLOVAC REPUBLIC
ECS Sluzby spol. s.r.o.
Staromlynska 29
82106 BRATISLAVA
Phone +421 2 45 25 96 06
+421 2 45 64 31 47
+421 2 45 64 31 48
Telefax +421 2 45 64 31 49

SLOVENIA
Lenze pogonska tehnika GmbH
Zbiljska Cesta 4
1215 MEDVODE
Phone +386 (0)1 361 61 41
Telefax +386 (0)1 361 22 88

SOUTH AFRICA
S.A. Power Services (Pty.) Ltd.
Unit 14, Meadowbrook Business Estates
Jacaranda Ave, Olivedale, Randburg 2158
P.O.Box 1137, RANDBURG 2125
Phone +27(11) 462-8810
Telefax +27(11) 704-5775

SOUTH KOREA
Hankuk Mechatro Ltd.
Room# 1409 Samhwan officetel 830-295
Beomil-dong, Dong-Gu
PUSAN
Phone +82 (0)51-635-6663
Telefax +82 (0)51-635-6632

SPAIN
Lenze Transmisiones, S.A.
Mila i Fontanals, 135-139
08205 SABADELL (Barcelona)
Phone +34 93 / 72 07 68 0
Telefax +34 93 / 71 22 54 1

SWEDEN
Lenze Transmissioner AB
P.O.Box 10 74, Attorpsgatan
Tornby Ind.
58110 LINKÖPING
Phone +46 (0)13 / 35 58 00
Telefax +46 (0)13 / 10 36 23

SWITZERLAND
Lenze Bachofen AG
Ackerstrasse 45
8610 USTER
Phone +41 (0) 43 399 14 14
Telefax +41 (0) 43 399 14 24

Vente Suisse Romande:
Route de Prilly 25
1023 CRISSIER
Phone +41 (0)21 / 63 72 19 0
Telefax +41 (0)21 / 63 72 19 9

SYRIA
Zahabi Co.
8/5 Shouhadaa Street
P.O.Box 8262
ALEPPO-SYRIA
Phone +963 21 21 22 23 5
Telefax +963 21 21 22 23 7

TAIWAN
ACE Pillar Co. Ltd.
No.12, Lane 61, Sec. 1,
Kuanfu Road, San-Chung City
TAIPEI HSIEN
Phone +886 (0)2 / 299 58 40 0
Telefax +886 (0)2 / 299 53 46 6

THAILAND
PSG-WESCO CO., LTD.
429 Moo 7, Theparak Road,
Tambol Theparak
Amphur Muang
SAMUTPRAKARN 10270
Phone +66 (0)2 / 383 5633
Telefax +66 (0)2 / 383 5637

TUNESIA
AMF Industrielle Sarl
Route de Gremda - Km 0,2
Immeuble El Madina,
Centre Bloc B - 5 ème - appt 52
3002 SFAX
Phone +216 74 403 514
Telefax +216 74 402 516

TURKEY
LSE Elektrik
Elektronik Makina, Otomasyon Mühendislik
San. Ve Tic. Ltd. Şti.
Atatürk mah. Cumhuriyet cad.
Yurt sok. No:7
ÜMRANIYE / İSTANBUL
Phone +90 (0)216 / 316 5138 pbx
Telefax +90 (0)216 / 443 4277

Bursa Address:
Demirtaspasa Mh.
Ata Sk. Petek Bozkaya Is Merkezi
D Blok No :5 / A
OSMANGAZI / BURSA
Phone +90 (0)224-2733232 pbx
+90 (0)224-2734151
+90 (0)224-2733238
Telefax +90 (0)224-2734150

UKRAINE
SV Altera Ltd.
Ivana Lepse ave, 4
KIEV, 03067
Phone +38-044 496 18 88
Telefax +38-044 496 18 18

UNITED KINGDOM/EIRE
Lenze Ltd.
Caxton Road
BEDFORD MK 41 OHT
Phone +44 (0)1234 / 32 13 21
Telefax +44 (0)1234 / 26 18 15

USA
AC Technology Corp.
630 Douglas Street
UXBRIDGE, MA 01569
Phone +1 508 / 278-9100
Telefax +1 508 / 278-7873

Lenze Corporation
1730 East Logan Avenue
EMPORIA, KS 66 801
Phone +1 620 / 343-8401
+1 888 / 269-2381
Telefax +1 620 / 342-2595
+1 800 / 469-0931

INTORQ GmbH & Co. KG

Postfach 1103
D-31849 Aerzen

Wülmser Weg 5
D-31855 Aerzen

Tel.: +49 (0) 5154 / 95 39-01
Fax.: +49 (0) 5154 / 95 39-10
E-Mail: info@intorq.de
www.intorq.de