

Bewegung durch Perfektion | Movement by Perfection

ZIEHL-ABEGG



Die Königsklasse The Royal League

Die Königsklasse in Lufttechnik, Regeltechnik und Antriebstechnik | The Royal League in ventilation, control and drive technology

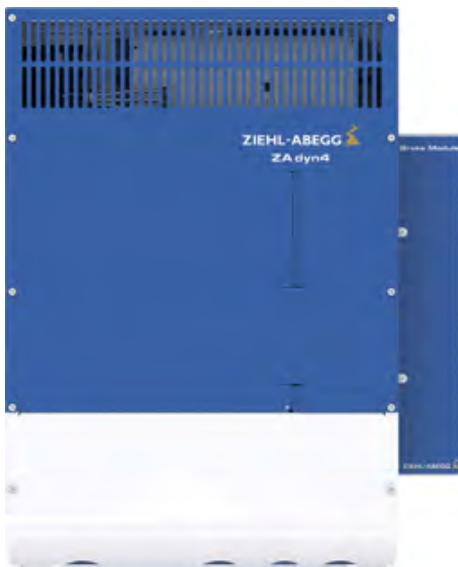


Brake Module

Brake activation for ZAdyn4C

Original operating instructions

Store for future use !



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Brake Module

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1 General information

1.1 Structure of the operating instructions

These Operating Instructions serve for safe working on and with the Brake Module for the ZAdyn4C. It contains safety instructions that must be complied with as well as information that is required for failure-free operation of the device.

Keep these operating instructions together with the device. It must be ensured that all persons that are to work on the device can refer to the operating instructions at any time. In addition to the operating instructions, directives in the sense of the ordinance on industrial safety and health and the work equipment ordinance are also to be provided. Keep the operating instructions for continued use. They must be passed-on to all successive owners, users and final customers.

1.2 Target group

The operating instructions address persons entrusted with planning, installation, commissioning and maintenance and servicing and who have the corresponding qualifications and skills for their job.

1.3 Exclusion of liability

Concurrence between the contents of these operating instructions and the described hardware and software in the device has been examined.

It is still possible that non-compliances exist; no guarantee is assumed for complete conformity. The contents of this manual are put through periodic reviews. Necessary modifications are incorporated into the next version.

ZIEHL-ABEGG SE is not liable for damage due to misuse, incorrect use, improper use or as a consequence of unauthorized repairs or modifications.

1.4 Copyright

These operating instructions contain copyright protected information. The operating instructions may be neither completely nor partially photocopied, reproduced, translated or put on data medium without previous explicit consent from ZIEHL-ABEGG SE.

Infringements are liable for damages.

All rights reserved, including those that arise through patent issue or registration on a utility model.

2 Safety instructions

2.1 General

This chapter contains instructions to prevent personal injury and property damage. These instructions do not lay claim to completeness. In case of questions and problems, please consult our company technicians.

2.2 Intended use




The Brake Module is an external auxiliary unit to the ZAdyn4C for activating the motor brakes with contactors. The device is not designed for any other use than those listed here – this is considered as improper use.



Reading these operating instructions and complying with all contained instructions – especially the safety instructions contained therein – are considered part of intended use. Furthermore, carrying out all inspection work in the prescribed scheduled intervals is part of intended use

Not the manufacturer, rather the operator of the Brake Module is liable for any personal harm or material damage arising from non-intended use!

2.3 Pictographs

Safety instructions are highlighted with warning triangles and are depicted according to the degree of hazard as follows.

	<p>Danger! General hazardous area. Death or severe injury or significant property damage can occur if the corresponding precautions are not taken!</p>
	<p>Warning! Risk of moderate or minor injury if the corresponding precautions are not taken!</p>
	<p>Caution! Material damage is possible if the corresponding precautions are not taken!</p>

	<p>Danger! Danger by dangerous, electric voltage! Death or severe injury can occur if the corresponding precautions are not taken!</p>
	<p>Information Important information and advice for user</p>

2.4 Product safety

The device conforms to the state of the art at the time of delivery and is fundamentally considered to be reliable. The device and its accessories must only be used in a flawless condition and installed and operated with compliance to the operating instructions. Exceeding the limits stated in the "Enclosure / technical data" chapter can lead to a defect in the device.

2.5 Requirements placed on the personnel / due diligence

Persons entrusted with the planning, installation, commissioning and maintenance and servicing in connection with the device must have the corresponding qualifications and skills for these jobs. Based on their training, knowledge and experience as well as knowledge of the relevant standards, they must be able to judge the work transferred to them and be able to recognize possible hazards.

In addition, they must be knowledgeable about the safety regulations, EU directives, rules for the prevention of accidents and the corresponding national as well as regional and in-house regulations. Personnel to be trained or instructed and apprentices are only permitted to work on the device under the supervision of an experienced person. This also applies to personnel undergoing general training.

Comply with the legal minimum age

2.6 Commissioning



Danger!

During commissioning, unexpected and hazardous conditions can arise in the entire installation due to defective adjustments, defective components or incorrect electrical connections

During the commissioning following has to be observed:

- Remove all persons and objects from the hazardous area
- The EMERGENCY-STOP functions must be in working order
- The mechanical safety brakes must be installed and in working order
- Commissioning is only permitted with compliance to the EMC directive 39/336/EEC

2.7 Working on device/hazards through residual voltage

Before working on previously installed devices, separate them from the mains and secure them against reconnection.



Danger!

Through use of capacitors in the ZAdyn4C danger of death exists even after switching off the ZAdyn4C through directly touching the energized parts or due to parts that have become energized due to faults.

After waiting **at least 3 minutes** work can be performed on the ZAdyn4C.

The safe isolation from the supply must be checked using a **two-pole** voltage detector.



Danger!

It is generally forbidden to carry out work on electrical live parts. Protection class of the device when open is IP 00! It is possible to touch hazardous voltages directly.

2.8 Modifications / interventions in the device

For reasons of safety, no unauthorized interventions or **modifications** may be made on the device .

All planned modifications must be authorized by the manufacturer in writing.

Use only genuine spare parts / genuine wearing parts / genuine accessories from the ZIEHL-ABEGG SE. These parts were specifically designed for the device. There is no guarantee that parts from non-original sources are designed and manufactured in correspondence with load and safety requirements.

Parts and special equipment not supplied by the ZIEHL-ABEGG SE are not approved for use.

2.9 Operator's obligation of diligence

The device has been designed and constructed with consideration of a hazard analysis and after carefully selecting the harmonized standards to be complied with as well as additional technical specifications. It thus complies with the state-of-the art and ensures the highest degree of safety.

However, this safety can only be implemented in operational practice if all measures necessary for this purpose are taken. The operator of the installation has the obligation of due diligence to plan these measures and monitor their implementation.

In particular, the operator must ensure that

- The device is only used as intended (cmp. chapter "Product overview" concerning this)
- The installation is operated solely in a flawless, functional condition and that especially the safety devices are periodically checked for their properly functioning condition
- The required personal safety gear is available to and used by the operating, maintenance and repair personnel
- The operating instructions are always readily available at the location where the frequency inverter is being used, are complete and are in legible condition
- Only sufficiently qualified and authorized personnel operate, maintain and repair the device

- these staff receive regular instruction in all relevant occupational safety and environmental protection issues, are knowledgeable about the operating instructions and, especially, are familiar with the safety instructions contained therein.
- All safety and warning notices attached to the device are never removed and remain legible

2.10 Employment of external personnel

Maintenance and service work are frequently carried out by external employees who often do not recognize the specific situations and the thus resulting dangers. These persons must be comprehensively informed about the hazards in their area of activity.

You must monitor their working methods in order to intervene in good time if necessary.

3 Product overview

3.1 Application

The Brake Module is an auxiliary unit to the ZAdyn4C for activating the motor brakes.

3.2 Functional description

Activation of motor brake

- Switching of the motor brakes by contactors according to the signals of the lift control or the ZAdyn4C

Triggering operation without contactors ZAdyn4C

- Two relays integrated into the Brake Module evaluate the safety circuit.
- Activation of the STO_A and STO_B inputs of the ZAdyn4C

3.3 Service & maintenance

These jobs must be completed during the recurrent maintenance work:

- Check the device for dirt and clean if necessary
- Check the connections and tighten if necessary

3.4 Transport

- The device is packed ex factory to suit the transport method previously agreed.
- Always use the original packaging materials when transporting the device
- Avoid shocks and impacts to the device during the transport

3.5 Disposal & recycling

Disposal must be carried out professionally and environmentally friendly in accordance with the legal stipulations.

4 Mechanical installation

4.1 General notes

The Brake Module is mounted on the side of the ZAdyn4C



Danger!

The following points must be complied with during the mechanical installation to avoid causing a defect in the device due to assembly errors or environmental influences:

Before installation

- Remove the device from the packing and check for any possible shipping damage
- Carry out installation only on a clean, level and stable foundation
- Assemble the device outside of the traffic area

During installation

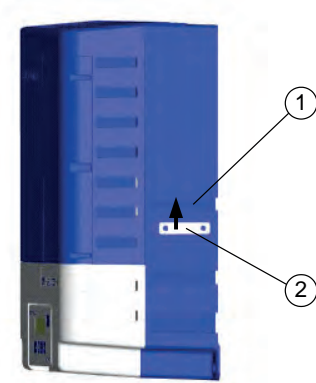
- Mount the device in a torsion free conditions
- Installation position: vertical, connection terminals (X-SC, X-BA, X-K1, X-K2) bottom; no horizontal mounting
- Mount the device in a torsion free conditions
- avoid that drilling chips, screws and other foreign bodies reach the interior of the device
- Maintain the stated minimum clearances to ensure unobstructed cooling- air feed as well as unobstructed outgoing air discharge (see fig. "Minimum clearances")

Ambient conditions

- mounting the device on vibrating components is not allowed
- the device must not be exposed to any shock
- Prevent humidity
- Avoid aggressive and conductive materials in the environment

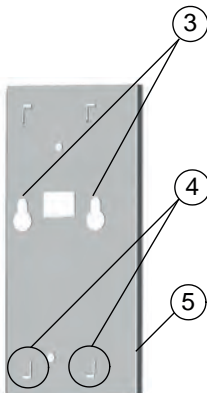
4.2 Assembly on the ZAdyn4C 011-032

- ▷ Push the mounting plate into the top groove of the ZAdyn4C



- 1 top groove
- 2 mounting plate

- ▷ Screw the M5 screws with washers two turns into the mounting plate.
- ▷ Fit the fastening plate in such a way that the M5 screws grip the recesses (3) in the fastening plate. The chamfer (5) on the fastening plate must be on the right-hand side.
- ▷ At the same time, hook in the hooks (2) on the fastening plate into the middle groove on the ZAdyn4C. In doing so, take care that the washers are located between the screw head and the fastening plate.



- fastening plate
- 3 recesses
- 4 hooks
- 5 chamfer

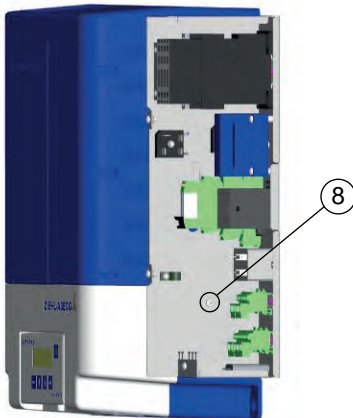
- ▷ Press the fastening plate down so that the M5 screws and the hooks snap in.

- ▷ Tighten the M5 screws.
- ▷ Hook the Brake Module into the top hooks on the fastening plate (6) with the openings at the side (7). Press the Brake Module down carefully until it is touching.



6 top hook of the fastening plate
7 openings of the Brake Module

- ▷ Remove the cover of the Brake Module.
- ▷ Tighten M4 screw.

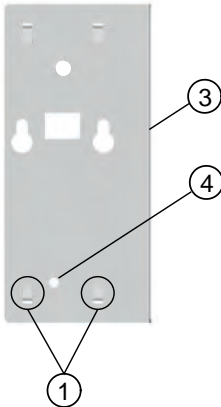


8 M4 screw

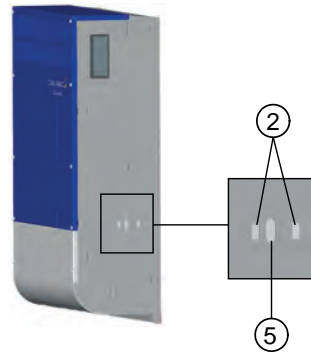
- ▷ Mount the cover of the Brake Module.

4.3 Assembly on the ZAdyn4C 040-074

- ▷ Insert the hook (1) of the fastening plate in the openings (2) on the right side of the ZAdyn4C. Ensure here that the chamfer (3) of the fastening plate is on the right side. The press-in nut (4) of the fastening plate grips the elongated hole (5) in the side of the ZAdyn4C.

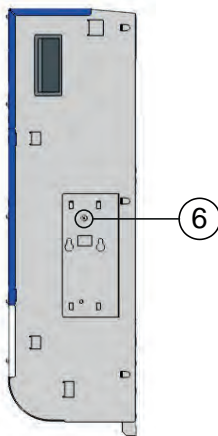


fastening plate
1 hooks
3 chamfer
4 Press-in nut



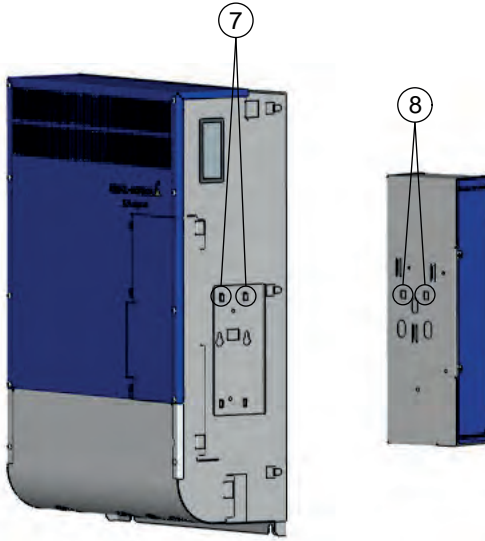
ZAdyn4C
2 Openings
5 Elongated hole

- ▷ Screw on the fastening plate with the screw M4 (6).



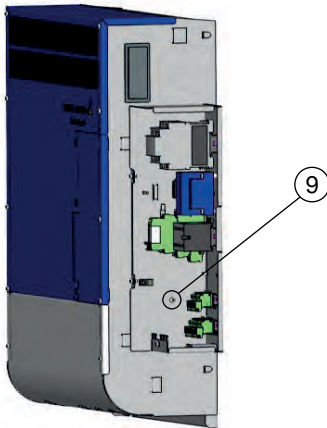
ZAdyn4C
6 M4 screw

- ▷ Hook the Brake Module into the top hooks on the fastening plate (7) with the openings at the side (8). Press the Brake Module down carefully until it is touching.



- 7 top hook of the fastening plate
- 8 openings of the Brake Module

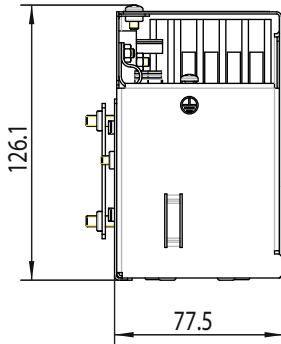
- ▷ Remove the cover of the Brake Module.
- ▷ Tighten M4 screw.



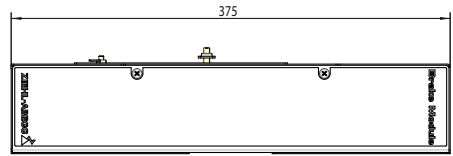
- 9 M4 screw

- ▷ Mount the cover of the Brake Module.

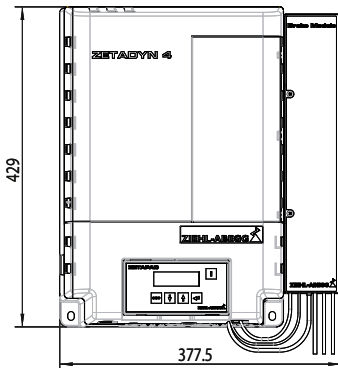
4.4 Dimensions / minimum clearances



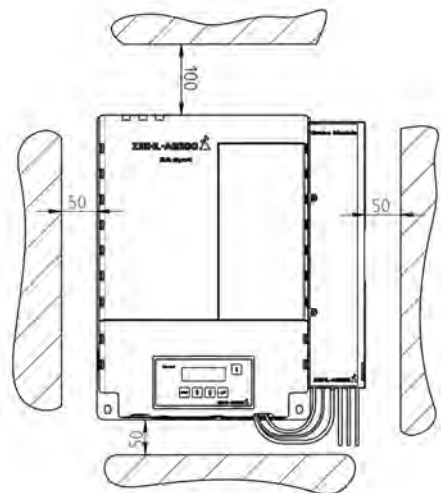
Brake Module dimensions in mm



ZDSB01M0

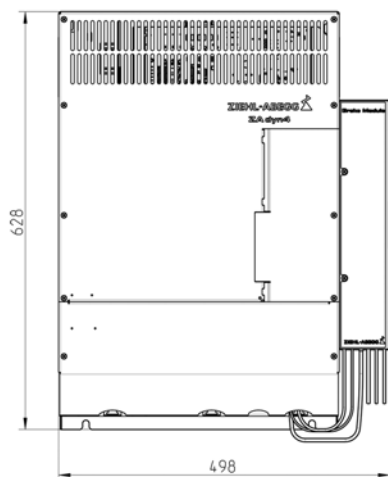


ZAdyn4C 011-032 and
Brake Module dimensions in mm

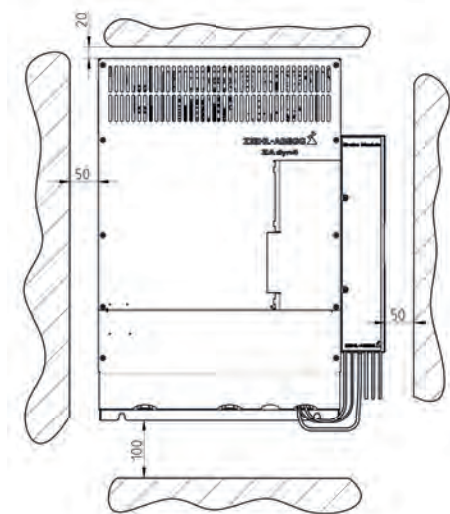


ZDSB01M0

ZAdyn4C 011-032 and
Brake Module minimum distances in mm



ZA dyn4C 040-074 and
Brake Module dimensions in mm



ZDSB01M0

ZA dyn4C 040-074 and
Brake Module minimum distances in mm

5 Electrical installation



Danger!

Never work on the Brake Module and the ZAdyn4C under voltage.
The intermediate circuit of the ZAdyn4C (terminals X4: +DC / X2:-DC) is still under voltage even after switching off the ZAdyn4C.
Wait at least 3 minutes before working on the device



Danger!

Operating the Brake Module with the housing cover removed is prohibited because energized, exposed parts are present inside the device. Disregarding this regulation can lead to severe personal injury.



Caution!

Parts can be destroyed by electrostatic discharge.
Discharge yourself by suitable action before working on electrical components (connectors, etc.).
You can do this, for example, by touching earthed metal parts.

Work on electric components may only be carried out by trained electricians or by persons instructed in electricity under the supervision of an electrician in accordance with electrical engineering regulations.

A second person must always be present when working on energized parts or lines who disconnects in case of emergency.

Inspect electrical equipment periodically: retighten loose connections – immediately replace damaged lines and cables.

Always keep switch cabinets and all electrical supply facilities locked. Access is only allowed for authorized persons using a key or special tool.

Never clean electrical equipment with water or similar liquids.

5.1 EMC-compatible installation

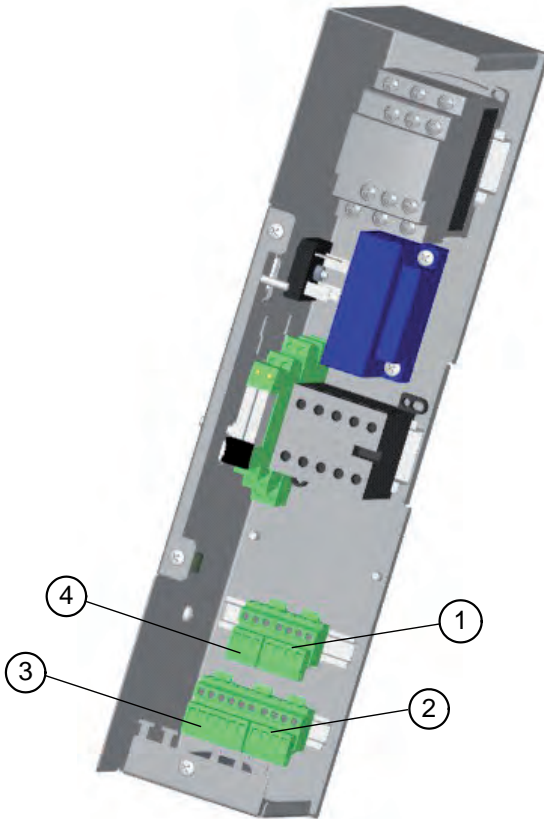
When correctly installed (see below), the device corresponds to the following standards:

- EN 12015 Electromagnetic compatibility – product series standard for lifts, escalators, moving pavements – spurious emission
- EN 12016 Electromagnetic compatibility – product series standard for lifts, escalators, moving pavements – interference immunity

The following points must be observed if the above mentioned standards are to be adhered to:

- Feed the voltage supply of the brake contactors through the line filter of the lift control

5.2 Terminal positions

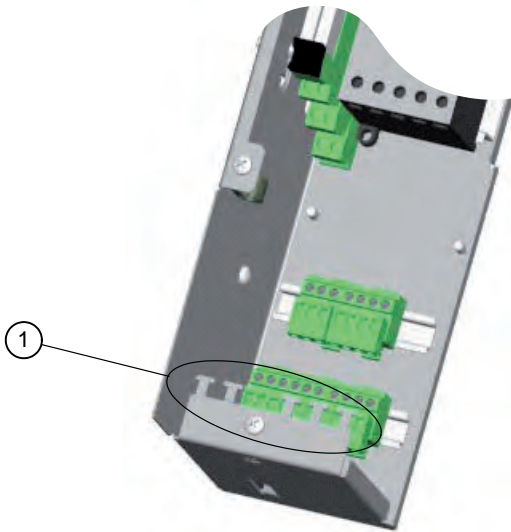


Terminal positions

- 1 X-BA activation of brakes
- 2 X-K1 monitoring of brake contactors
- 3 X-K2 Voltage supply brakes / Break test, emergency rescue
- 4 X-SC activation of STO relays safety circuit

5.3 Strain relief

- ▷ A cable tie must be attached to all lines for strain relief. Fix the cable ties to the recesses provided in the Brake Module housing (see fig.).

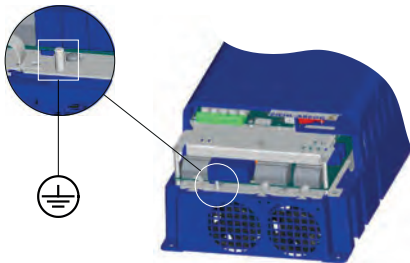


1 recesses for strain relief

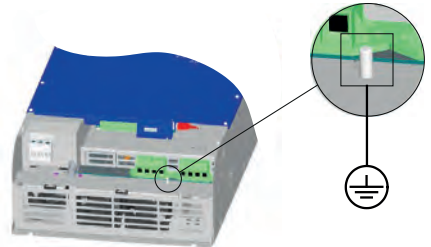
5.4 Protective earth connection

The protective earth is already pre-assembled on the Brake Module.

- ▷ Connect the protective earth of the Brake Module to the protective earth connection of the ZAdyn4C.



PE conductor connection ZAdyn4C 011-032



PE conductor connection ZAdyn4C 040-074

5.5 Connection motor brake

The maximum line length is 25 m.

- ▷ Connect the motor brakes to the terminal X-BA.

ZIEHL-ABEGG SE offers the pre-fabricated cable L-BA-...-HX-BM/SBM.

5.6 Connection ZAdyn4C

5.6.1 Activation of the brake contactor K3.

The brake contactor K3 is activated by a relay-output of the ZAdyn4C.

The cable L-SL-...-HX-BM/SBM-MB is already connected to the Brake Module.

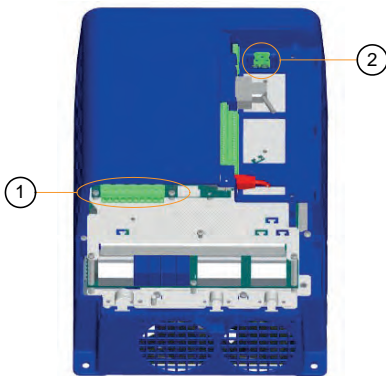
- ▷ Connect this cable to the output with the function "MB_Brake" at the terminal X-OUT of the ZAdyn4C (see fig.).

☞ See the ZAdyn4C Operating Instructions for further information about the allocation of the outputs at connection terminal X-Out of the ZAdyn4C.

5.6.2 Triggering operation without contactors

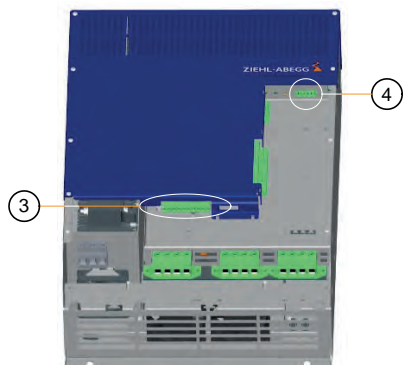
The cable L-SL-...-HX-BM/SBM-STO for activating the inputs STO_A und STO_B is already connected to the Brake Module.

- ▷ Plug this cable on the terminal X-STO of the ZAdyn4C (see fig.).



Position of connection terminal ZAdyn4C 011-032

- 1 X-Out digital outputs
- 2 X-STO Safe Torque Off



Position of connection terminal ZAdyn4C 040-074

- 3 X-Out digital outputs
- 4 X-STO Safe Torque Off

5.7 Connection control system

5.7.1 Evaluation of the safety circuit

The operation without contactors of the ZAdyn4C requires the evaluation of the safety circuit. The relays K1 and K2 are activated depending on the safety circuit.

▷ Connect the safety circuit to the terminal X-SC.

ZIEHL-ABEGG SE offers the pre-fabricated cable L-SL-...-HX-BM/SBM-SC.

5.7.2 Contactor control

▷ Connect the contactor monitoring to the terminal X-K1.

ZIEHL-ABEGG SE offers the pre-fabricated cable L-SL-...-HX-BM/SBM-K.

5.7.3 Motor brake operating voltage

▷ Connect the voltage supply of the motor brakes to the terminals 9 and 10 of the terminal X-K2.

5.7.4 Brake test / emergency rescue

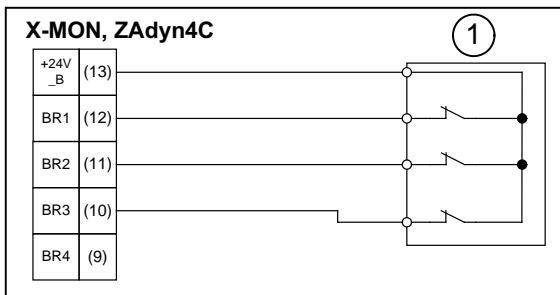
▷ Connect the cable for the brake test / the emergency operation to the terminals 5-8 of the terminal X-K2.

5.8 Brakes

5.8.1 Brake contactors

5.8.1.1 Brake release monitoring by the ZAdyn4C


With activated lock function the brake release monitoring fulfills the requirements for self monitoring according to chapter 9.11.3 of EN81-1:2010 for brake elements for protection against unintended movement of the car.



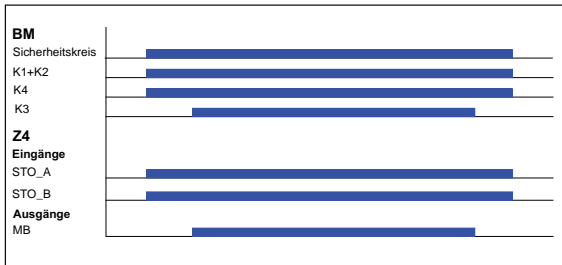
Connection of brake release monitor to the ZAdyn4C

1 Monitoring contacts

() terminal designation of connector

 For further information about the brake release monitoring by the ZAdyn4C, see the ZAdyn4C Operating Instructions, chapter "Electrical Installation/Brakes".

5.9 Process



K1, K2 STO relay

K4 Brake contactor

K3 Brake contactor

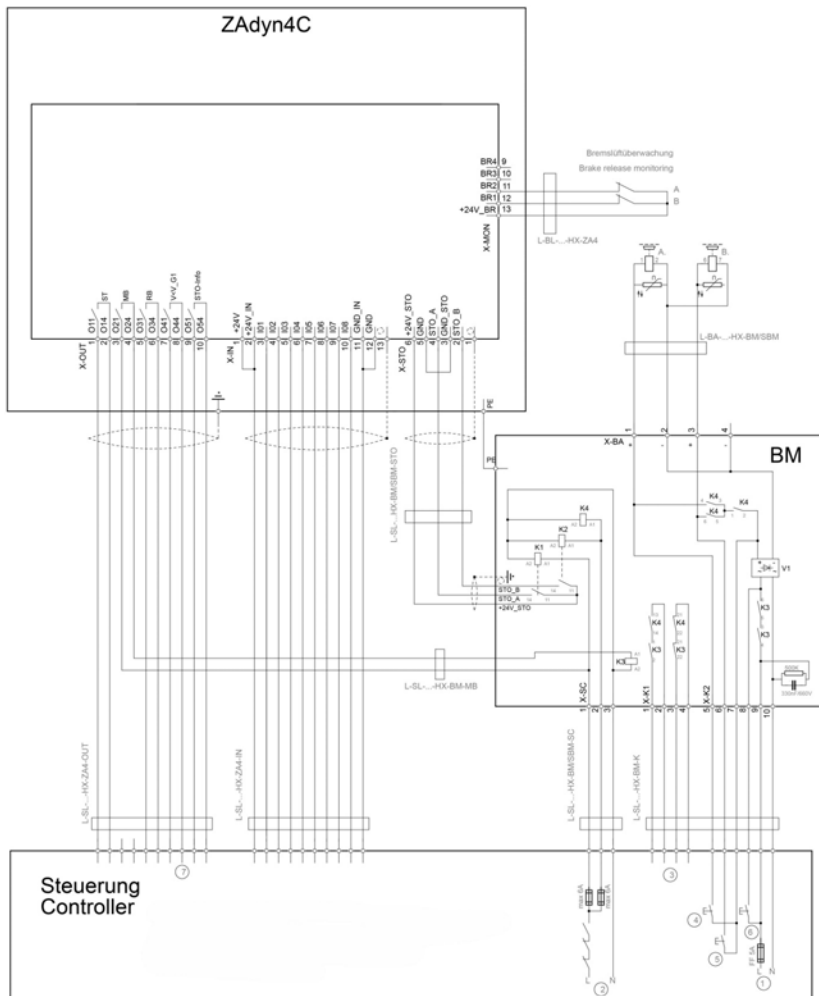
STO_A Input STO_A

STO_B Input STO_B

MB_Brake Mechanical brake

5.10 Circuit suggestions Brake Module and ZAdyn4C

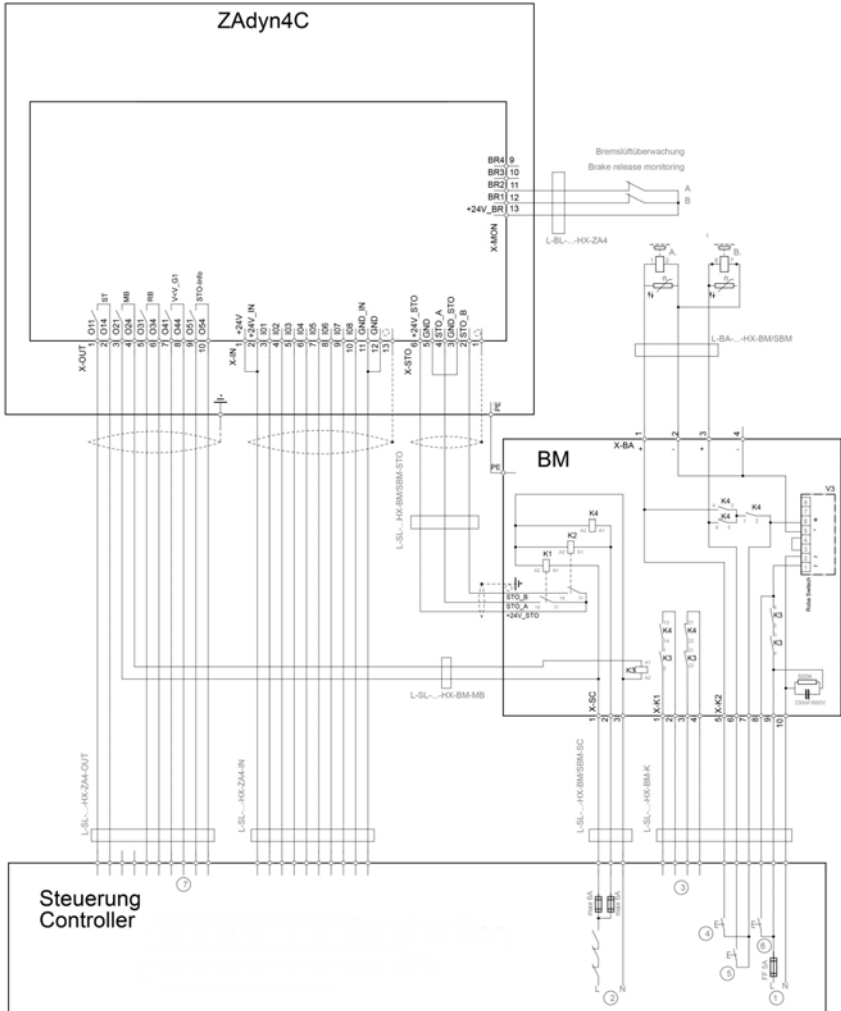
5.10.1 Actuation of brakes without over excitation



Z0SB01K1

- 1 Power supply brakes
- 2 Power supply contactor / Safety circuit
- 3 Contactor control
- 4 manual brake release A
- 5 manual brake release B
- 6 Emergency operation / two-circuit test
- 7 Relay outputs

5.10.2 Actuation with over excitation



Z05B01K2

- 1 Power supply brakes
- 2 Power supply contactor / Safety circuit
- 3 Contactor control
- 4 manual brake release A
- 5 manual brake release B
- 6 Emergency operation / two-circuit test
- 7 Relay outputs

6 Enclosure

6.1 Technical Data Brake Module

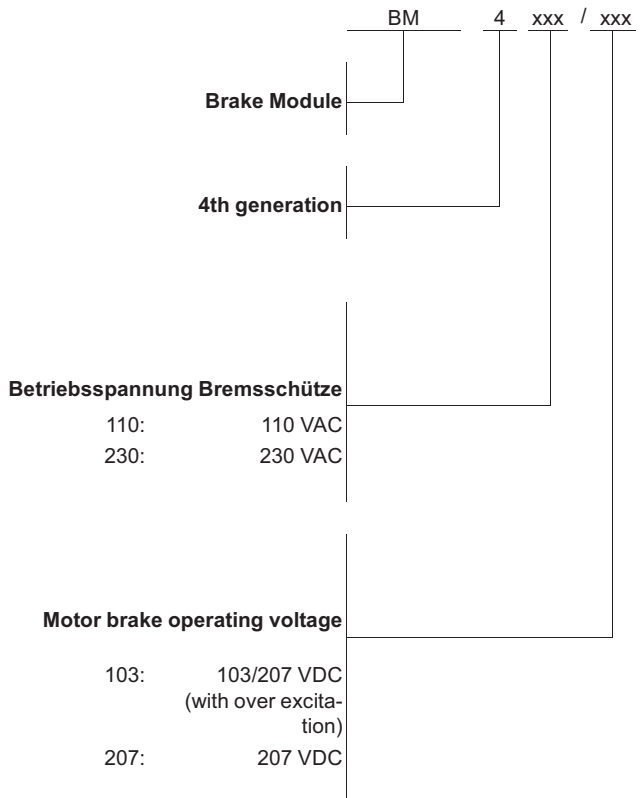
	BM				
	4-230-207	4-110-207	4-230-103	4-110-103	
Electrical data					
Mains connection voltage brake, U~	[V]	max. 253		100-250	
Mains frequency	[Hz]	50 / 60 ($\pm 1,5$ Hz)			
Holding output voltage	[V]	0,9 x U~		0,45 x U~	
Output voltage at over excitation	[V]	-		0,9 x U~	
Rated current	[A]	2.0		2,0	
Rated current at over excitation	[A]	-		3.5	
Rated power	[W]	400		200	
Nominal power at over excitation	[W]	-		700	
Max. heat dissipation	[W]	< 20			
Max. fuse protection of contactors	[A]	6			
Max. fuse protection of brake	[A]	FF5 (wire fuse)			
Nominal voltage contactors K1-K4	[V]	1 ~ 230	1 ~ 110	1 ~ 230	1 ~ 110
Power consumption contactors K1 / K2	[VA]	0.7			
Power consumption contactor K3	[VA]	≤ 5			
Power consumption contactor K4	[VA]	7			
Drop out time* contactor K3	[ms]	40			
Drop out time* contactor K4	[ms]	19			

	BM			
	4-230-207	4-110-207	4-230-103	4-110-103
Ambient conditions				
The user must ensure that the specified ambient conditions are observed.				
Protection class	IP20			

Ambient conditions operation	[°C]	0 ... 45
Relative humidity	[%]	90 / condensation prohibited
Installation height	[m über NN]	bis 2000 m
Storage and shipping temperature	[°C]	-20...+60 °C
Degree of soiling (in acc. with DIN EN 61800-5-1)		2
Physical data		
Weight	[kg]	2.5
Dimensions h x w x d	[mm]	375 x 78 x 128

* Period between field discharge of the magnet coil and interruption of the contacts

6.2 Type designation



6.3 Part no.

Brake Module	
BM 4-230/207	357263
BM 4-230/103	357264
BM 4-110/207	357265
BM 4-110/103	357266

6.4 EU declaration of conformity

- Translation -
(english)

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Manufacturer: ZIEHL-ABEGG SE
Heinz-Ziehl-Straße
74653 Künzelsau
Germany

The manufacturer shall bear sole responsibility for issuing this EU declaration of conformity.

Product description: Brake control BM

Type: BM 4-230/207 BM 4-230/103
BM 4-110/207 BM 4-110/103

The above mentioned products of this declaration fulfil all relevant provisions of the following Directives of the Union:

Low Voltage Directive 2014/35/EU
EMC Directive 2014/30/EU

The following harmonised standards have been used:

EN 61800-5-1:2007	Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy
EN 12015:2014	Electromagnetic compatibility – Product family standard for lifts, escalators and moving walkways – electromagnetic interference
EN 12016:2013	Electromagnetic compatibility- Productfamily standard for lifts, escalators and moving walks - Immunity

This declaration relates exclusively to the product in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user.

The authorised representative for the assembly of the technical file is:
Mr. Roland Hoppenstedt (see above for address).

Künzelsau, 20.04.2016
(place and date of issue)

ZIEHL-ABEGG SE
Werner Bundscherer
Director Drive Division
(name, function)



(signature)

ZIEHL-ABEGG SE
Roland Hoppenstedt
Technical Director Drive Division
(name, function)



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