

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



ZA dynpro

Frequency inverter

Original operating instructions

Store for future use!

Part 1

-Installation

-Start-up

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1 General

Compliance with the following instructions is mandatory to ensure the functionality and safety of the product. If the following instructions given especially but not limited for general safety, transport, storage, mounting, operating conditions, start-up, maintenance, repair, cleaning and disposal / recycling are not observed, the product may not operate safely and may cause a hazard to the life and limb of users and third parties.

Deviations from the following requirements may therefore lead both to the loss of the statutory material defect liability rights and to the liability of the buyer for the product that has become unsafe due to the deviation from the specifications.

The ZAdynpro may be operated in the area of application of standards EN 12015 and EN 12016 (compare chapter 5.2 "EMC compatible installation") only with the expert use of a line reactor. ZIEHL-ABEGG recommends the use of the line reactor of type NDxx which is optimally geared to the ZAdynpro (compare also chapter 5.5. "Mains connection"). Also outside the area of application of standards EN 12015 and EN 12016, the use of a line reactor is the precondition for the validity of the type examination of the STO function (Safe Torque Off according to DIN EN 61800-5-2).

1.1 Validity

This instruction manual applies to:
 Frequency inverter from the series:ZAdynpro
 as of software version 4.71.2

1.2 Meaning of the operating instructions

These operating instructions help you to work safely on and with the frequency inverter ZAdynpro. They contain safety instructions that must be complied with as well as information that is required for failure-free operation of the frequency inverter.

The operating instructions are to be stored together with the frequency inverter. It must be ensured that all persons who have to perform activities on the frequency inverter can consult the operating instructions at any time. Instructions for use in accordance with the German Occupational Safety and Health Act and the German Work Equipment Ordinance must be provided in addition to the operating instructions.

Keep the operating instructions for continued use. They must be passed-on to all successive owners, users and final customers.

1.3 Target group

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

1.4 Exclusion of liability

It has been established that the content of these operating instructions is concurrent with the frequency inverter hardware and software described.

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.

Symbols description

	<p>Asynchronous motors The contents in the operating instructions refer specifically to the operation of asynchronous motors.</p>
	<p>Synchronous motors: The contents in the operating instructions refer specifically to the operation of synchronous motors.</p>

1.5 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.

1.6 Explanation of symbols and designators

Symbol	Meaning
▷	Instruction. Follow the instructions in sequence in the order described.
✓	Result of an action (result). Here, the result of an action is described.

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 ZAdynpro is a field-orientated Frequency inverter for RPM control of asynchronous motors and synchronous motors. The Frequency inverter is designed for lift systems used to convey people and cargo. The device is not designed for any other use than those listed here – this is considered 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

The operator of the ZAdynpro is liable for any personal harm or material damage arising from non-intended use! The manufacturer shall bear no liability for such damage!

2.3 Pictographs

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

	Danger! General hazardous area. Death or severe injury or significant property damage can occur if the corresponding precautions are not taken!
	Warning! Risk of moderate or minor injury if the corresponding precautions are not taken!
	Caution! Material damage is possible if the corresponding precautions are not taken!
	Danger! Danger by dangerous, electric voltage! Death or severe injury can occur if the corresponding precautions are not taken!

**Information**

Important information and advice for user

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 start-up, unexpected and hazardous conditions can arise in the entire system due to incorrect settings, 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 function 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, danger of death exists even after switching off the device through directly touching the energized parts or due to parts that have become energized due to faults.

Wait **at least 3 minutes** before working on the device.

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.

The warranty shall be void if the device is tampered with or modified without authorisation.

2.9 Operator's obligation of diligence

The device has been designed and built after conducting a risk analysis and after careful selection of the harmonised standards to be complied with as well as other technical specifications. It therefore complies with the state of the art and guarantees maximum safety during operation. However, this safety can only be achieved in practical operation when all the necessary measures are taken. The machine operator therefore has a duty of care to ensure that these measures are planned and to supervise their execution.

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 is frequently carried out by external personnel who are often unfamiliar with the specific circumstances and the resulting hazards.

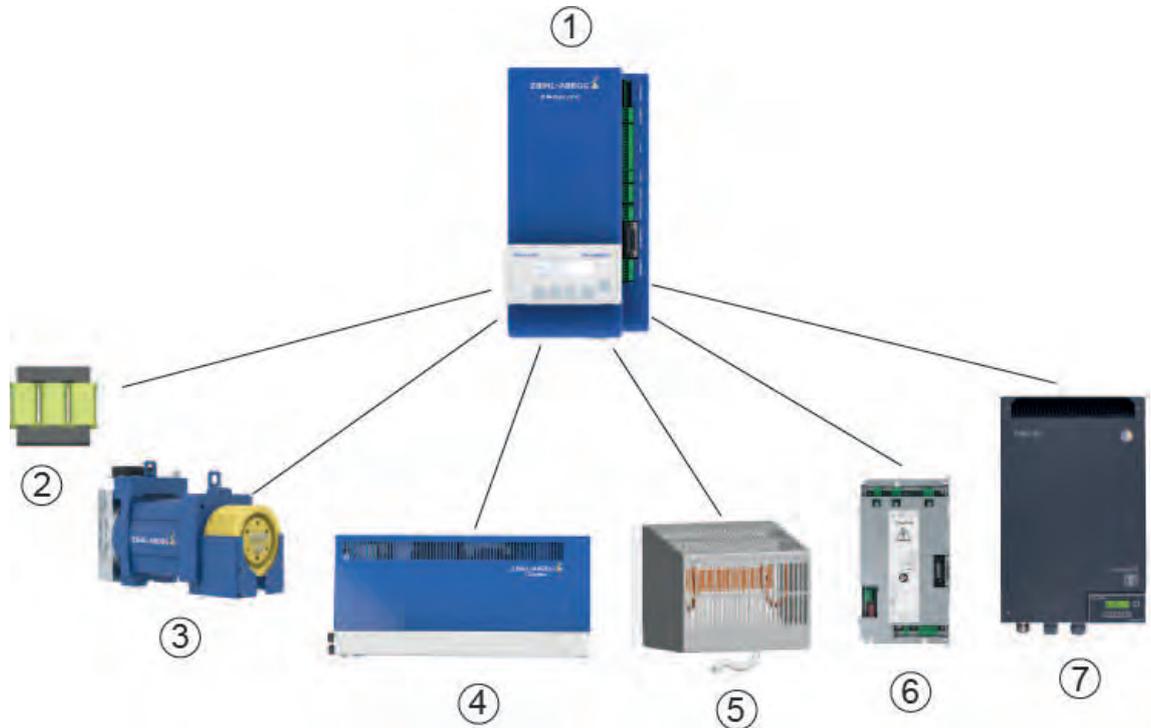
These persons must be comprehensively informed about the hazards in their area of activity.

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

3 Product overview

3.1 System overview

The drive system for ZIEHL-ABEGG SE elevators consists of several individual components.



1) ZAdynpro

Frequency inverter for RPM control of asynchronous motors and synchronous motors.

2) Power choke

System component to reduce current harmonics and to attenuate commutation notches and line feedback.

3) Elevator drive

Synchronous or asynchronous motor, with and without gearbox.

4) ZArec4c (optional)

Power feedback unit for elevator systems with frequency inverter.

5) Brake resistor

System component to convert energy generated during the regenerative run into heat.

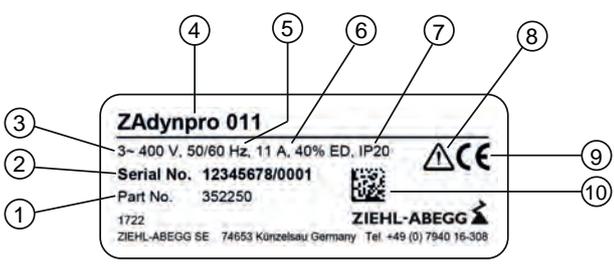
6) ZAsbc4B (optional)

System component for contactorless actuation of electromechanical brakes.

7) EVAC3C (optional)

Evacuation module for automatic evacuation run in case of mains failure.

3.2 Name plate



ZAdynpro 011
 3~ 400 V, 50/60 Hz, 11 A, 40% ED, IP20
 Serial No. 12345678/0001
 Part No. 352250
 1722
 ZIEHL-ABEGG SE 74653 Künzelsau Germany Tel. +49 (0) 7940 16-308



ZAdynpro 011-032

no.	Designation
1	Part no.
2	Series number:
3	Mains connection voltage
4	Series
5	Mains frequency
6	Rated current for 40% on time
7	Protection rating
8	Touch current in protective earth line exceeds an alternating current of 3.5 mA, or a direct current of 10 mA
9	CE mark
10	Internal DATA MATRIX code of ZIEHL-ABEGG SE



ZAdynpro 040-074

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

3.4.1 Storage duration:

The storage duration depends particularly on the electrolytic capacitors because the oxide coating in the capacitor deteriorates.

Storage duration:

- 12 months at -20 ... +50 °C
- 24 months at -20 .. +45 °C
- 36 months at -20 .. +40 °C

If storage exceeds the stated maximum storage times, you must carry out a reformation of the capacitors before applying the entire mains voltage to the frequency inverter.

New formation:

To reform, the ZAdynpro needs to be connected to reduced voltage (230 VAC at L1 / L2) for approx. 1 hour.

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 frequency inverter ZAdynpro is designed for mounting on the wall in the switch cabinet. Mounting outside of the switch cabinet is not permitted.
- Ensure that there is sufficient cooling in the switch cabinet. When doing so, observe the power loss of the ZAdynpro.
- The following points must be complied with during the mechanical installation to avoid causing a defect in the frequency inverter due to assembly errors or environmental influences.

Ambient conditions

- It is not permitted to mount the frequency inverter on vibrating components
- The frequency inverter must not be exposed to any shock
- Prevent humidity
- Avoid aggressive and conductive materials in the environment

Mounting

- Check frequency inverter for any transport damage
- Mounting is performed on a metallic mounting plate
- Mount the device in torsion free conditions

ZAdynpro 011-032:

- Mounting position: Vertical, connection terminals X3, X-STO, X-SBY and X1, bottom
- Permitted installation positions:
 - Mounted with the rear on the mounting plate (see Fig.)
 - Mounted with the side surface on the mounting plate (see Fig.). An additional mounting bracket is required for this.



ZAdynpro 011-032 mounted with rear on mounting plate



ZAdynpro 011-032 with side surface mounted on mounting plate

ZAdynpro 040-074:

- Assembly position: vertical, connection terminals X-OUT1, X-PAD, X1, X2, X3 bottom
- Allowed installation position: Mounted with rear on mounting plate (see Fig.)

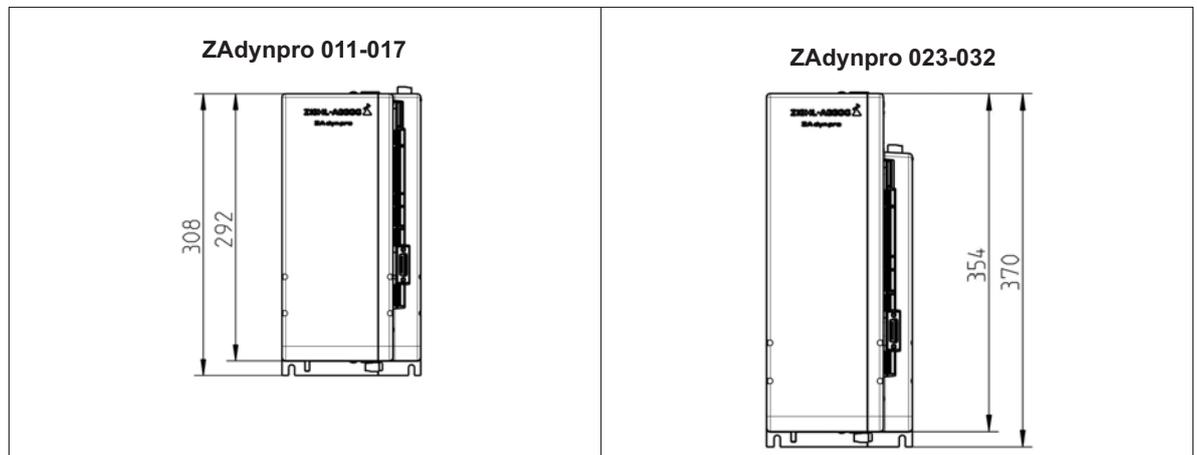


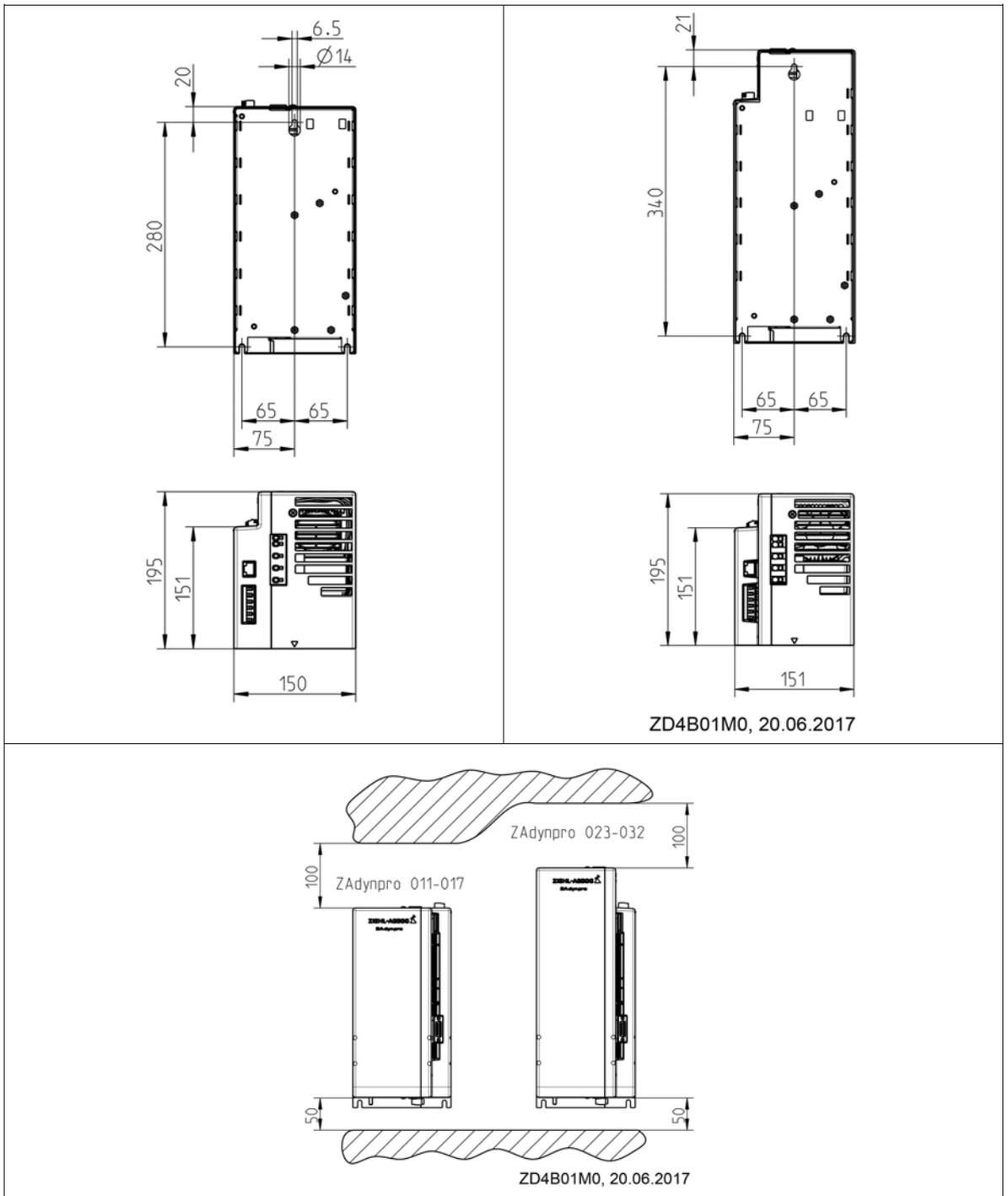
ZAdynpro 040-074 mounted with rear on mounting plate

- Mount the frequency inverter so that it is isolated
- Prevent drilling chips, screws and other foreign bodies from reaching the interior of the frequency inverter
- Maintain the stated minimum clearances to ensure unobstructed cooling- air feed as well as unobstructed outgoing air discharge (see fig. "Minimum clearances")
- Ensure sufficient cooling when mounting in the switch cabinet. When doing so, observe the power loss of the ZAdynpro.

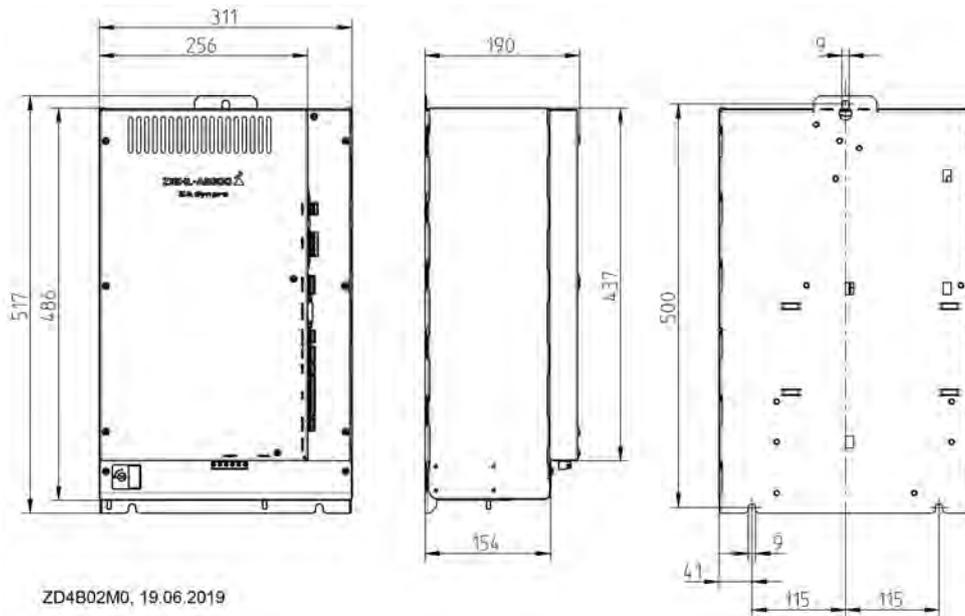
4.2 Dimensional drawings / Minimum distances

4.2.1 ZAdynpro 011-032

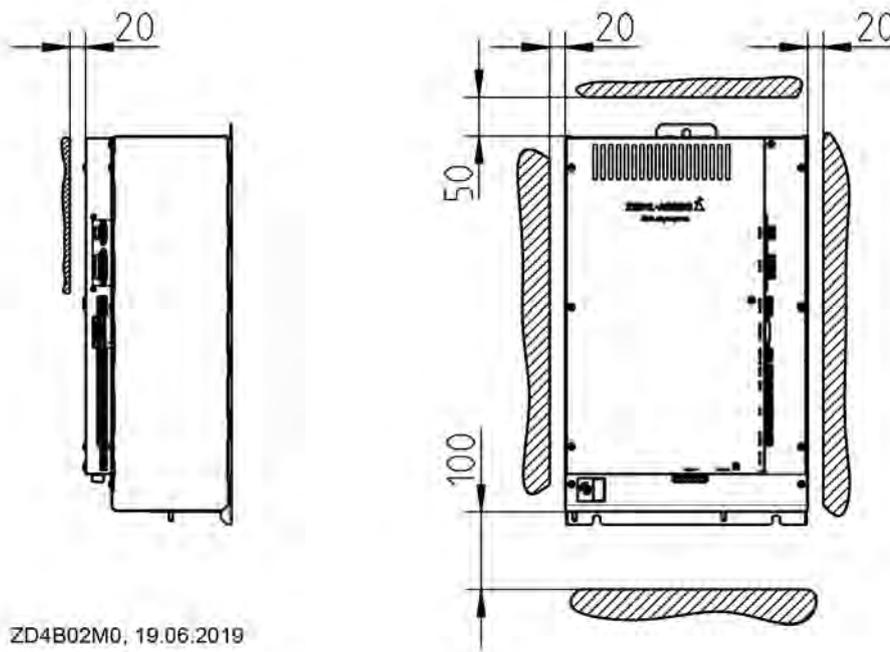




4.2.2 ZAdynpro 040-074



ZD4B02M0, 19.06.2019



ZD4B02M0, 19.06.2019

5 Electrical installation

5.1 General



Danger!

It is forbidden to carry out work on the frequency inverter when it is live.
Even after disconnection, the DC-link (terminals X2: +DC / X2:-DC) is still live.
Wait at least 3 minutes before working on the device



Danger!

It is not permitted to operate the ZAdynpro with the housing covers removed, as exposed live parts are present inside the frequency inverter. Failure to observe this provision can lead to serious 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.
- Electrical equipment must be checked regularly: Loose connections are to be re-tightened and damaged cables must be replaced immediately.
- 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.
- Incorrectly wired connections can destroy the electrical/electronic components.

5.2 EMC-compatible installation

5.2.1 Standards

When correctly installed, the frequency inverter corresponds to the following standards:

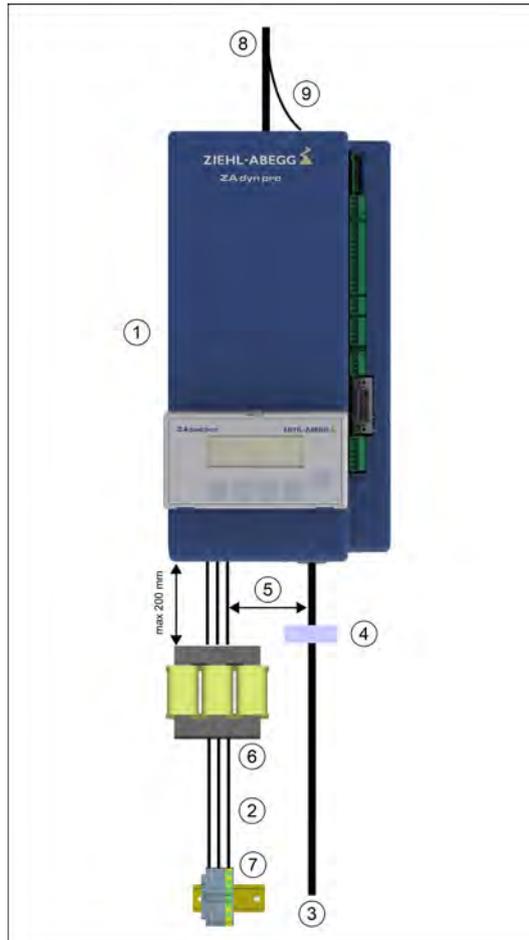
- EN 12015:2014 Electromagnetic compatibility – Product family standard for lifts, escalators and moving walks – Emission
- EN 12016:2013 Electromagnetic compatibility – Product family standard for lifts, escalators and moving walks – Interference immunity

5.2.2 Electrical connection

Lead	Cable length	Shielding	ZAdynpro shield coating version
Power line	-	-	-
Motor cable	Max. 25 m	Earthed at both ends	Clip on mounting plate
Brake chopper/brake resistor line	Maximum 5 m	Earthed at both ends	ZAdynpro 011-032: Pigtail on connection terminal ZAdynpro 040-074: Pigtail on threaded bolt of protective earth connection
Connecting line for standby input	Max. 25 m	-	-
Connecting line for the digital inputs	Max. 25 m	-	-
Connecting lines for the digital outputs	Max. 25 m	-	-
Rotary encoder line	Max. 25 m	Earthed at both ends	Via connector
Temperature monitoring of brake resistor	Maximum 5 m	Earthed at the inverter end	Pigtail
STO line	Max. 50 m	Earthed at both ends	Pigtail
Connecting line for ZApadpro	Max. 50 m	Earthed at both ends	Via connector
Connecting line of rotary encoder simulation	Max. 25 m	Earthed at the customer system end	-
Connecting line for CAN interface	<ul style="list-style-type: none"> • Main line: Max. 200 m • Stub lines: Max. 6 m 	-	-
Connecting cable DCP interface	Max. 50 m	Earthed at the inverter end	Pigtail
Connecting line for brake release monitoring	Max. 25 m	-	-

- Do not twist shielding for connections; use a suitable shield connection system
- Run the control cables and the encoder cables separate from the power cables
- Provide connected inductances (brakes, contactors) with suppressors
- In order to use the ZAdynpro safely and in compliance with standards, a power choke of type ND... from ZIEHL-ABEGG must be integrated into the power line. For assignment of the frame sizes of the ZAdynpro to the respective power chokes, refer to chapter "Electrical installation/Mains connection".
- Operating the ZAdynpro without the ND.. type power choke voids all warranty entitlements.
- In the case of a supply line of > 25 m (motor line) or > 5 m (brake resistor line), adherence to standard **EN 12015** (Electromagnetic compatibility – Emission) and **EN 12016** (Electromagnetic compatibility – Interference immunity) can no longer be guaranteed.
- If you must interrupt the shielding on a particular line (e.g. to install motor contactors), the shielding must be subsequently continued with the lowest possible HF impedance.
- Use shielded lines in the switching cabinet also
- Feed the voltage supply of the motor contactors through the mains filter of the elevator control

5.2.3 EMC-compatible assembly of the control cabinet



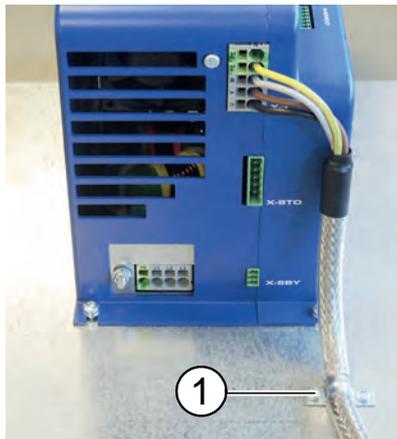
- 1 ZAdynpro mains connection terminal
- 2 Power line
- 3 Motor cable (shielded)
- 4 Clip for fixing the shielding
- 5 Route electrical lines with the maximum possible spacing
- 6 Line reactor
- 7 Mains supply terminal
- 8 Brake resistor cable (shielded)
- 9 Shielding (brake resistor cable)

The following points must be observed if the standards outlined in chapter "EMC-compatible installation/Standards" are to be adhered to:

- Refer to chapter "EMC-compatible installation/Standards"
- Cable length between power choke and ZAdynpro maximum 200 mm
- Route the power line (including the mains connection terminal and power choke) separately from the brake resistor line and the motor line

5.2.4 Motor cable, brake resistor cable

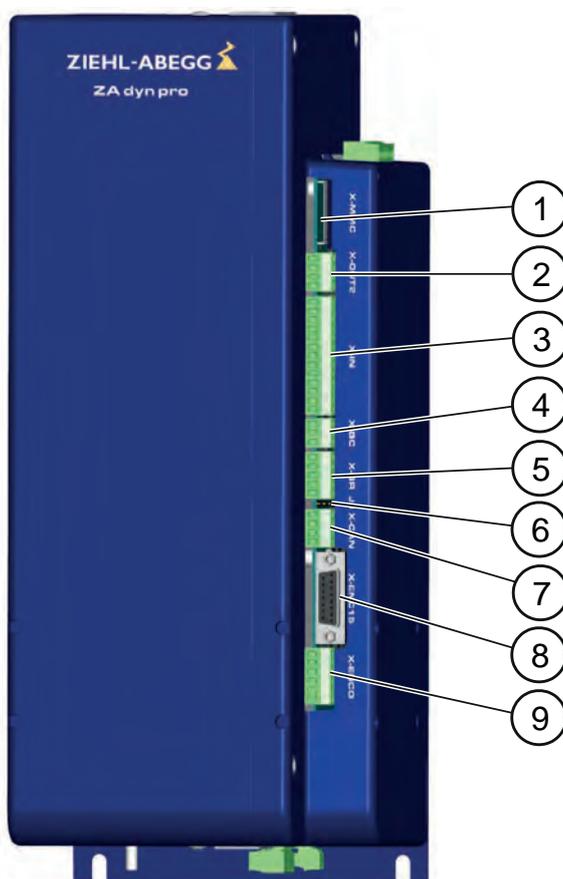
- For ZAdynpro 011-032, the screening of the motor cable in the immediate vicinity of the ZAdynpro must be extensively connected to the earth potential. The screening must be continued right up to the connection terminal.
- For ZAdynpro 040-074, the screening of the motor cable and the screening of the brake resistor cable in the immediate vicinity of the ZAdynpro must be extensively connected to the earth potential. The screening must be continued right up to the connection terminal.
- We recommend fixing the shielding on the mounting plate by means of a clip (see Fig.).



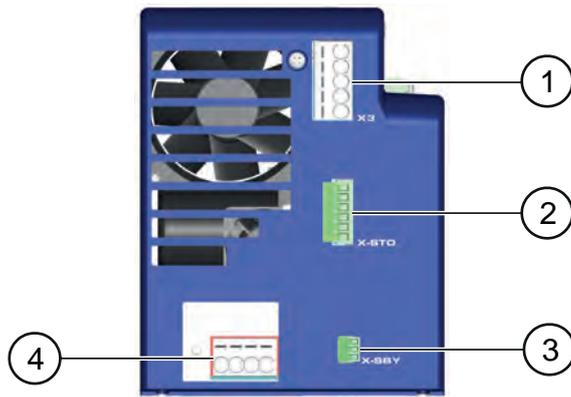
Fixing the shielding on the mounting plate
 1 Clip

5.3 Terminal positions

5.3.1 ZAdynpro 011-032

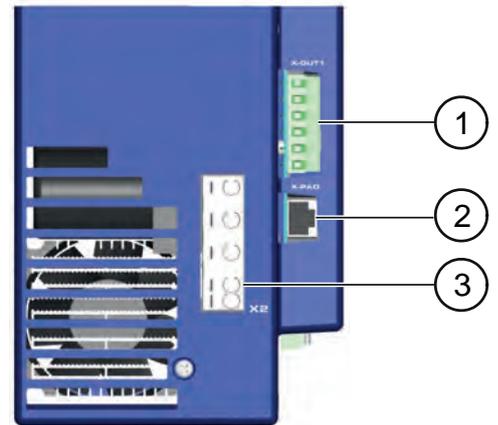


- Front terminal positions
- 1 X-MMC memory card
 - 2 X-OUT2 digital outputs
 - 3 X-IN digital inputs
 - 4 X-BC temperature monitoring for brake resistor/brake chopper
 - 5 X-BR inputs for function monitoring of the motor brakes
 - 6 J4 terminating resistance CAN line
 - 7 X-CAN CAN/DCP
 - 8 X-ENC15 rotary encoder SUB-D
 - 9 X-ENCO rotary encoder simulation



Position of connection terminals on bottom

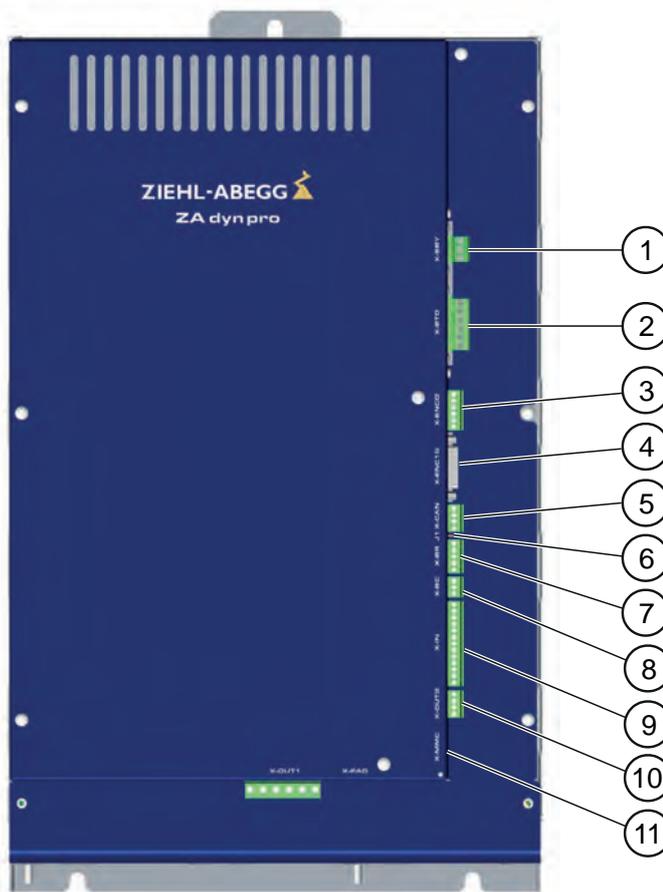
- 1 X3 motor
- 2 X-STO Safe Torque Off
- 3 X-SBY standby input
- 4 X1 line



Terminal positions top

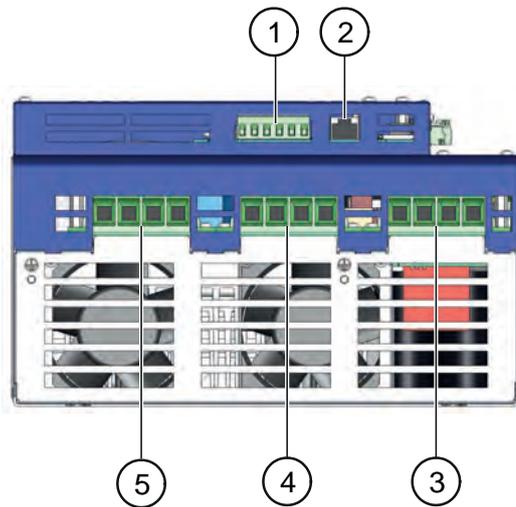
- 1 X-OUT1 digital outputs
- 2 X-PAD ZApad
- 3 X2 brake chopper/brake resistor

5.3.2 ZAdynpro 040-074



Front terminal positions

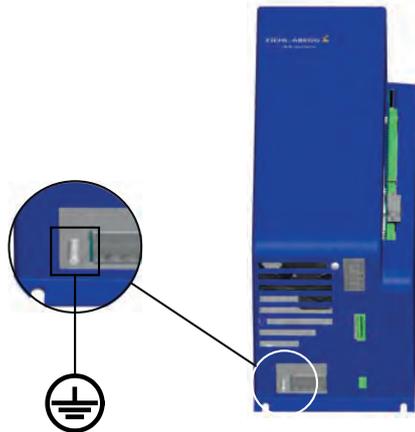
- 1 X-SBY standby input
- 2 X-STO Safe Torque Off
- 3 X-ENCO rotary encoder simulation
- 4 X-ENC15 rotary encoder SUB-D
- 5 X-CAN CAN/DCP
- 6 J1 terminating resistance CAN line
- 7 X-BR inputs for function monitoring of the motor brakes
- 8 X-BC temperature monitoring for brake resistor/brake chopper
- 9 X-IN digital inputs
- 10 X-OUT2 digital outputs
- 11 X-MMC memory card



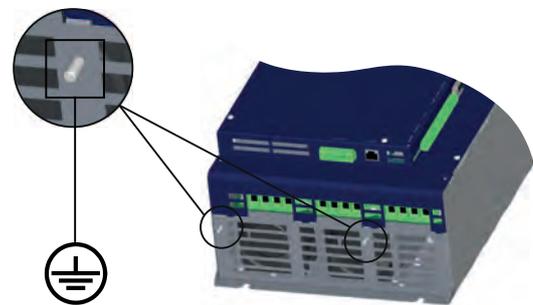
- Position of connection terminals on bottom
- 1 X-OUT1 digital outputs
 - 2 X-PAD ZApad
 - 3 X3 motor
 - 4 X2 brake chopper/brake resistor
 - 5 X1 line

5.4 Protective ground connection

- The touch current of the ZAdynpro is more than 3.5 mA alternating current. Therefore, the following additional conditions must be satisfied in compliance with EN 61800-5-1:
 - Fixed connection of the ZAdynpro
 - The cross-section of the protective conductor must be at least 10 mm². Otherwise, an additional protective conductor with the same cross-section as the original one must be connected. The additional protective conductor is connected to an M6 threaded bolt on the ZAdynpro (see Fig.)
- If cores L1, L2 and L3 of the mains supply line have a cross-section of < 16 mm², the cross-section of the protective conductor must be at least the same as that of cores L1, L2 and L3.
- If cores L1, L2 and L3 of the mains supply line have a cross-section of 16 to 35 mm² the cross-section of the protective conductor must be at least 16 mm².
- If the protective conductor is not part of the power supply cable, the following applies: If the protective conductor is protected against mechanical damage by a cable duct or conduit or any another measure, the cross-section of the protective conductor must be at least 2.5 mm². With no protection against damage, it must be at least 4 mm².



M6 threaded bolt for protective earth connection for ZAdynpro 011-032



M6 threaded bolt for protective earth connection for ZAdynpro 040-074

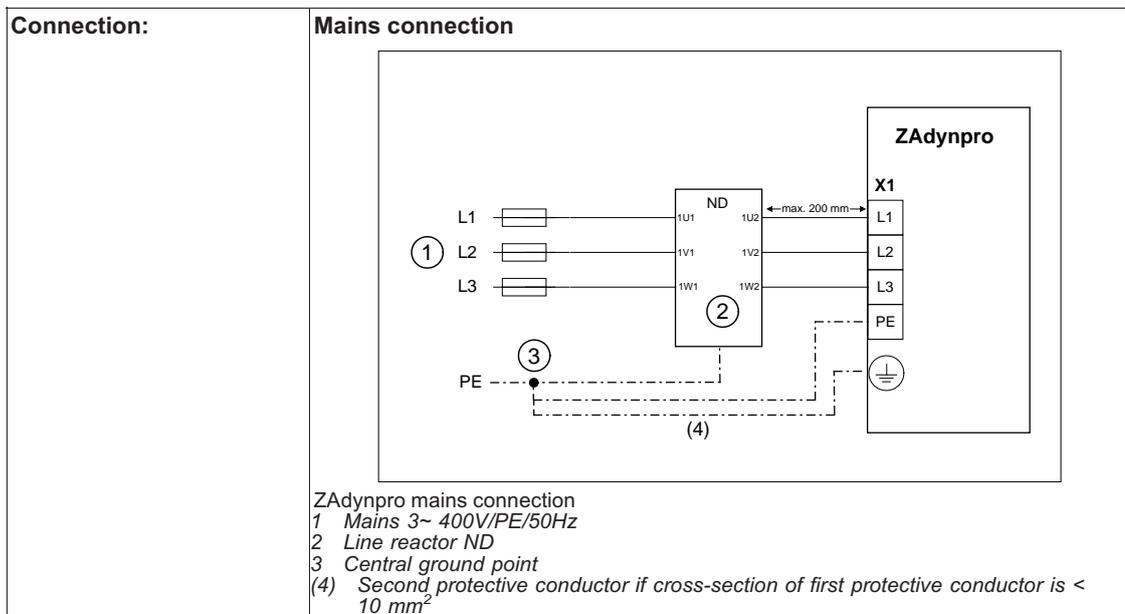
5.5 Mains connection (X1)



Danger!

Before connecting the ZAdynpro to the mains supply, it must be checked that the technical specifications on the rating plate and in the operating instructions of the ZAdynpro match the characteristics of the mains supply.

Designation of the connection terminal:	X1		
Network configurations:	<ul style="list-style-type: none"> The line filter and ZAdynpro are designed for use in an earthed power supply system. Permissible network configurations are: <ul style="list-style-type: none"> – TN network – TT network The mains filter and ZAdynpro are unsuitable for use in the IT network! 		
Line cross-section:	<ul style="list-style-type: none"> The line cross-section must be specified dependent on the nominal motor current and the ambient conditions (e.g. temperature, wiring method) in accordance with DIN VDE 0100. 		
Type of cable:	<ul style="list-style-type: none"> Rigid or flexible lines In the case of flexible lines: Wire end ferrules recommended Not shielded 		
Connection type:	ZAdynpro 011-032: Spring-type terminals ZAdynpro 040-074: Screw terminals		
Mains fuse	The size of the mains fuse must reflect the cable cross-section used and the ambient conditions. Use the following maximum fuse sizes, depending on the frame size of the ZAdynpro:		
	ZAdynpro frame size	Max. fuse for operating class gG	
	011/013	16 A	
	017	20 A	
	023	25 A	
	032	35 A	
	040	50 A	
	050	63 A	
	062	80 A	
	074	80 A	
Line reactor:	In order to use the ZAdynpro safely and in compliance with standards, a power choke of type ND... from ZIEHL-ABEGG SE must be integrated into the power line. Use the following power chokes, depending on the frame size of the ZAdynpro:		
	ZAdynpro frame size	Line reactor	
	Article number for power choke		
	011	ND011	357180
	013	ND013	357181
	017	ND017	357182
	023	ND023	357183
	032	ND032	357184
	040	ND040	357185
	050	ND050	357186
062	ND062	357187	
074	ND074	357188	



5.6 Residual current operated device (RCCB)

Frequency inverters of the ZAdyn type require no RCCB circuit breaker for operation. The circuit at the ZAdynpro output is monitored by an electronic short-circuit protection. On detecting a short-circuit current at the output of the ZAdynpro (and thus negligible impedance between the phase conductor and a body or the protective conductor of the circuit or the protective conductor of the operating equipment in the case of an error) the output current is switched off within a time of <20 µs. On condition that the potential equalisation for the ZAdynpro and the motor was performed according to the valid standards (VDE0100-Part 540:2012-06 and DIN EN 50178:1997), this behaviour is sufficient for the automatic switch-off in the case of an error demanded by VDE 0100-4100. If an RCCB circuit breaker is required for special reasons (e.g. fire prevention), an all-current-sensitive RCCB circuit breaker type B must be used. For maximum operational reliability, ZIEHL-ABEGG recommends the use of an RCCB circuit breaker with a reference fault current of 300 mA for fire prevention according to regulation VdS 3501.



Information

Please note that even when using a correct FI circuit breaker of type B, false tripping due to high protective earth currents (leakage currents) can still occur.

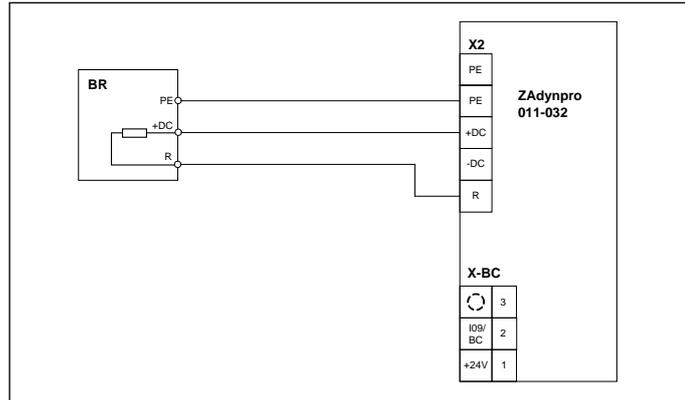
5.7 Brake resistor (X 2)

Designation of the connection terminal:	X2
Line cross-section:	max. 6 mm ²
Type of cable:	Shielded
Cable lengths:	<ul style="list-style-type: none"> • Maximum 5 m • If the pre-assembled line is not long enough in the brake resistor of the BR11-A type, this can be extended up to a length of 5 m. A shielded, self-extinguishing line is required for this.
Connection type:	ZAdynpro 011-032: Spring-type terminals ZAdynpro 040-074: Screw terminals
Parametrisation:	<p>The brake resistor or brake chopper used must be configured in the menu Encoder & BC/BC_TYP.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <pre>Encoder & BC ↳ BC_TYPE BR25 ↳ BR25 BR/BC - Type</pre> </div>

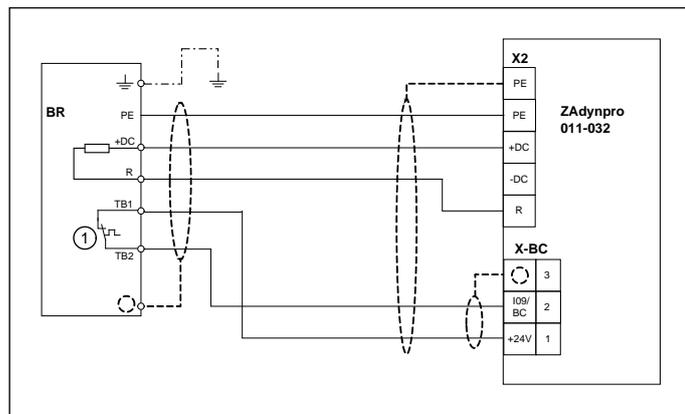
Connection:

Brake-Resistor connection

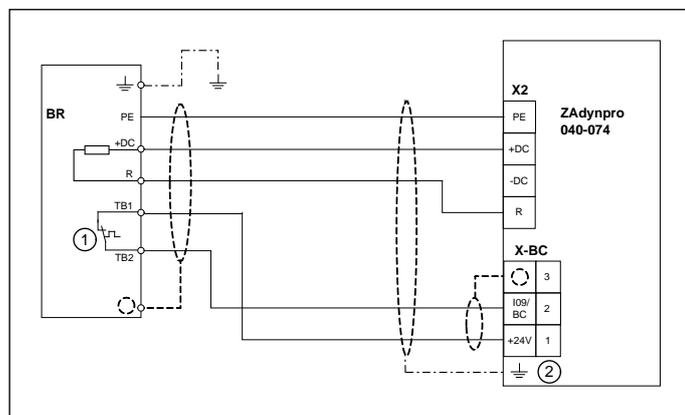
The brake resistor type BR11-A has no temperature monitoring.



Connection BR11-A / BR 14-A to ZAdynpro 011-032



Connection BR17/ BR 25 / BR50 / BR100 to ZAdynpro 011-032
 1 Max. contact load: 5 A / 250 VAC



Connection BR17/ BR 25 / BR50 / BR100 to ZAdynpro 040-074
 1 Max. contact load: 5 A / 250 VAC
 2 Threaded bolt for protective earth connection

CAUTION!

Caution!

It is imperative for an existing temperature monitor to be connected to the ZAdynpro! The brake resistor or the brake chopper may be burnt out in the event of a fault!

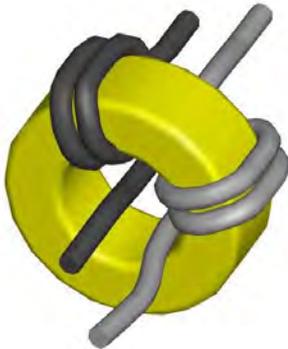
CAUTION!

Caution!

If the connection of a brake resistor (type BRxx) to the +DC and -DC terminals is faulty, it will emit a continuous power output and the device will become overheated. If a temperature monitor is not connected, the device will burn out!

Type BR11-A

Brake resistor BR11-A possesses connected connecting wires. These must be wound twice around the toroidal core provided. It is important to wind both wires with the same direction of winding (see figure).



Toroidal core BR11-A

5.8 Motor connection (X 3)

Designation of the connection terminal:	X3
Line cross-section:	The line cross-section must be specified dependent on the motor's current and the ambient conditions (e.g. temperature, wiring method) in accordance with DIN VDE 0298-4.
Type of cable:	<ul style="list-style-type: none"> • Shielded line • Rigid or flexible lines • Rated voltage U_0 / U: 450 / 750 VAC
Cable lengths:	<ul style="list-style-type: none"> • Max. 25 m
Connection type:	ZAdynpro 011-032: Spring-type terminals ZAdynpro 040-074: Screw terminals
Connection:	<p>Connection asynchronous motor / synchronous motor</p>



Danger!

Always switch off the mains voltage when connecting the motor line. The contactorless operation mode ("safe torque off" function (STO)) does **not** galvanically isolate the output stage of the frequency inverter from the motor line connection terminal!



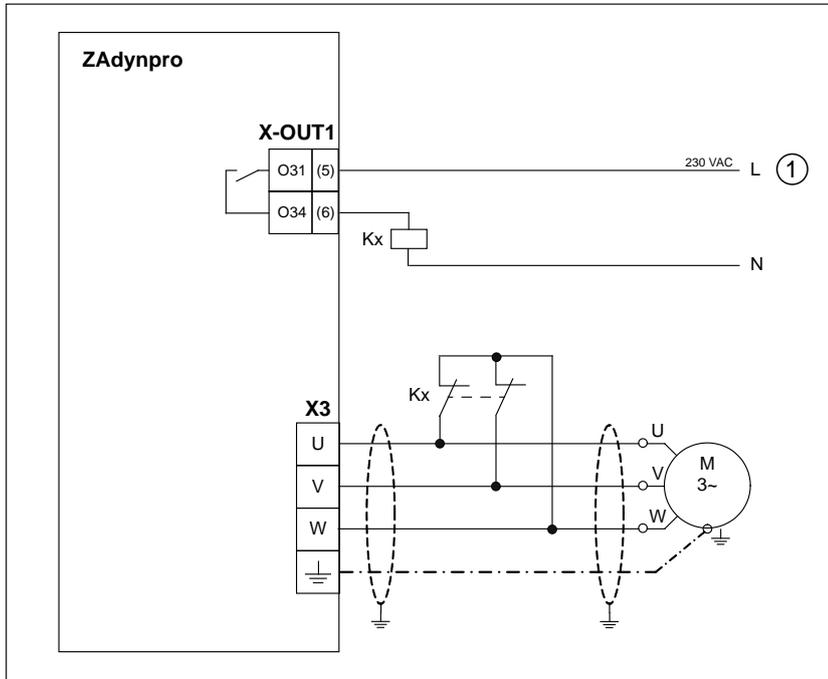
Danger!

When operating the motor with a rotary encoder, the line to the motor must be connected on the motor and inverter side phase-correct: U -> U / V -> V / W -> W. Never swap the connection; not even if the rotary direction of the motor is false!! If the motor phases are swapped, motor control is generally not possible. This can lead to jerky movements or uncontrolled acceleration of the motor.

Short-circuit of motor windings (for synchronous motors only)



In case of manual emergency evacuation by opening the brakes, the motor windings may be short-circuited by a contactor. The short-circuit generates a speed-dependent brake torque which is sufficient in most cases to limit the elevator speed to a safe level.



Principle circuit diagram for motor windings short circuit
 1 The voltage supply to the contactor must be independent of the safety chain.

Parametrisation:

To activate the function, configure a digital output in the **Control** menu to **MotShortCirc**.



Information

- The digital output configured to **MotShortCirc** is activated as soon as the motor is energised.
- The short circuit is to be deactivated by checking the weight balancing by opening the brakes.

CAUTION!

If operating with synchronous motors from other manufacturers, you have to ensure that a manually emergency evacuation is approved.

5.9 Motor temperature monitoring

The ZAdynpro has no integrated electronic thermal overload protection for the motor. The required monitoring must be performed by the higher-level elevator control system or other means.

5.10 Digital inputs (X-IN)

Designation of the connection terminal:	X-IN	
Number of the digital inputs:	8, freely configurable	
Technical data:	The digital inputs comply with the IEC61131-2 TYPE 2 industry standard.	
	Voltage range:	+22 ... 26 VDC
	Current consumption at 24 V:	10 mA (-20%)
	Switching level low/high:	<5 VDC / >11 VDC
Line cross-section:	max. 1,5 mm ²	
Type of cable:	<ul style="list-style-type: none"> Individual conductors Not shielded 	
Cable lengths:	Max. 25 m	
Connection type:	Screw terminals	
Connection:	<p>Connection with external power supply</p> <p>1 Control () terminal designation of connector</p> <p>When using the external power supply the bridges between the terminals +24V / +24V_IN and GND / GND_IN the pre-assembled control cable X-I are not required. These must be removed!</p>	
	<p>Connection with internal power supply</p> <p>1 Control () terminal designation of connector</p> <p>When using the internal power supply, a bridge must be placed between the +24V / +24V_IN terminals and between GND / GND_IN.</p>	

CAUTION!

Caution!

The internal 24 V power supply is provided solely for the digital inputs. Switching consumer load with this voltage is prohibited!

Terminal assignment X-IN

- You can configure the inputs I1 ... I8 assignments. The configuration can be implemented by:
 - Presetting the used control system (assignment corresponding to the control requirements)
 - Free configuration
- Implement configuration of the digital inputs in the **Control system\CONFIG** menu.

The input assignments dependent on the configuration:

Configuration ¹⁾	Inputs							
	I01	I02	I03	I04	I05	I06	I07	I08
00:Free	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	Free
01:ZA_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	Free
03:BP_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	Free
08:KN_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	Free
11:NL_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	Free
13:SS_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	V4
15:ZA_BIN	RF	DIR	BIN0	BIN1	BIN2	Free	Free	Free
16:WL_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	V4
21:ST_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	Free
24:CSILVA	RF	BIN0	BIN1	BIN2	Free	RV2 DOWN	RV1 UP	Free
25:X_BIN	XBIN2	XBIN1	XBIN0	RV1 UP	RV2 DOWN	Free	Free	RF
27:MAS_BIN	RF	DIR	MBIN0	MBIN1	MBIN2	BR1	BR2	Free
30:KS_IO	RF	V1	V4	V2	VZ	RV1 UP	RV2 DOWN	V3
31:KL_IO	V4	V1	V2	V3	VZ	RF+RV1	RF+RV2	PA-RA*2
32: S_SMART	RF	V1	LZ	V3	V4	RV1 UP	RV2 DOWN	Free

1) For the description of the configurations, see chapter "Parameter List/Control Menu" in the operating instructions - Part 2.



Information

To be able to travel, at least the following input signals need to be present:

- Controller enable
- Speed
- Direction

5.10.1 Binary travelling speed default

Fixed binary allocation (CONFIG=15:ZA_BIN)

travel speed	Function of input		
	BIN2	BIN1	BIN0
-	0	0	0
V1	0	0	1
V2	0	1	0
V3	0	1	1
V4	1	0	0
V5	1	0	1
V6	1	1	0
VZ	1	1	1

Free binary allocation (CONFIG=25:X_BIN)

Travelling speeds can be freely allocated to the binary codes. The allocation is made using the parameters **Control system/X_BIN1...X_BIN7**.

Function of input			travel speed
XBIN2	XBIN1	XBIN0	
0	0	0	-
0	0	1	Control system/X_BIN1
0	1	0	Control system/X_BIN2
0	1	1	Control system/X_BIN3
1	0	0	Control system/X_BIN4
1	0	1	Control system/X_BIN5
1	1	0	Control system/X_BIN6
1	1	1	Control system/X_BIN7

5.11 Digital outputs (X-OUT1, X-OUT2)

Designation of the connection terminals:	X-OUT1 X-OUT2		
Number of outputs:	X-OUT1: 3, freely configurable X-OUT2: 2, freely configurable		
Technical data:		X-OUT1	X-OUT2
	Short-circuit-proof	no*	no*
	Min. switching capacity	5 mA / 12 VDC	5 mA / 12 VDC
	Max. switching capacity	2 A / 250 VAC	500 mA / 24 VDC
Line cross-section:	max. 1,5 mm ²		
Type of cable:	Not shielded		
Cable lengths:	Max. 25 m		
Connection type:	Screw terminals		
Connection:	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>X-OUT1</p> <p>1 Control () terminal designation of connector</p> </div> <div style="text-align: center;"> <p>X-OUT2</p> <p>1 Control () terminal designation of connector</p> </div> </div>		

CAUTION!

Caution!

* In order to protect the relay contacts, switched inductivities must be provided with an external suppressor circuit (suppressor diode, RC element).

Terminal assignment of X-OUT1, X-OUT2

- The output assignments can be configured. The configuration can be implemented by:
 - Presetting the used control system (assignment corresponding to the control requirements)
 - Free configuration
- Implement configuration of the digital outputs in the **Control system\CONFIG** menu.
- Please refer to the "Parameter list/Control menu" chapter for a description of the individual parameters

The output assignments dependent on the configuration:

Configuration ¹⁾	Outputs				
	O11 - O14	O21 - O24	O31 - O34	O41 - O44	O51-- 54
00:Free	Fault	MB_Brake	RB	V < V_G1	STO-Info
01:ZA_IO	Fault	MB_Brake	RB	V < V_G1	STO-Info
03:BP_IO	Fault	MB_Brake	RB	V < V_G1	STO-Info
08:KN_IO	Fault	MB_Brake	RB	V < V_G1	STO-Info
11:NL_IO	Fault	MB_Brake	RB	V < V_G1	STO-Info
13:SS_IO	Fault	MB_Brake	RB	V < V_G1	STO-Info
15:ZA_BIN	Fault	MB_Brake	RB	V < V_G1	STO-Info
16:WL_IO	Fault	MB_Brake	RB	V < V_G1	STO-Info
21:ST_IO	Fault	MB_Brake	RB	V < V_G1	STO-Info
24:CSILVA	Fault	MB_Brake	RB	V < V_G1	STO-Info
25:X_BIN	RB	MB_Brake	V=O	Fault	STO-Info
27:MAS_BIN	Fault	MB_Brake	RB	Off*	STO-Info
30:KS_IO	Fault	MB_Brake	RB	V < V_G1	STO-Info
31:KL_IO	Fault	MB_Brake	RB	Evac.Dir.	STO-Info
32: S SMART	Fault	MB_Brake	RB	SD	STO-Info

1) For the description of the configurations, see chapter "Parameter List/Control Menu" in the operating instructions - Part 2.

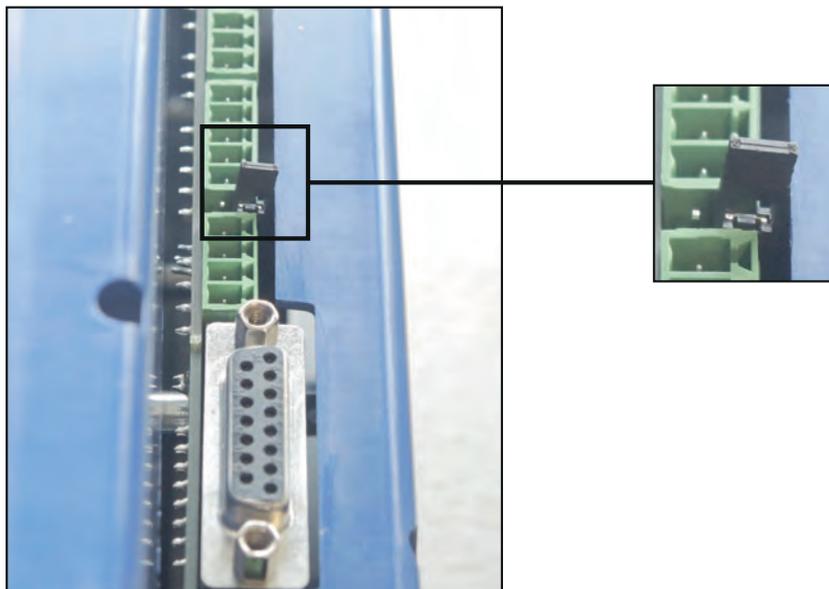
5.12 CAN/DCP interface (X-CAN)

Either the CANopen lift cable or the DCP cable is connected to the X-CAN connection terminal.

CANopenLift

Designation of the connection terminal:	X-CAN									
Line cross-section:										
Type of cable:	<ul style="list-style-type: none"> • Not shielded • Twisted pair 									
Cable lengths:	<ul style="list-style-type: none"> • Main line: Max. 200 m • Stub lines: Max. 6 m 									
Connection type:	Screw terminals									
Connection:	<ul style="list-style-type: none"> • The wiring is in a linear structure. The individual devices are connected to the main line with short stub lines. • The bus should be terminated with a terminating resistor of 120 - 150 Ohms, at both ends of the bus. <div style="text-align: center;"> <p>X-CAN</p> <table border="1"> <tr> <td>CH</td> <td>(4)</td> <td rowspan="4" style="text-align: center;"> </td> </tr> <tr> <td style="text-align: center;">⊙</td> <td>(3)</td> </tr> <tr> <td>CL</td> <td>(2)</td> </tr> <tr> <td>GND/COM</td> <td>(1)</td> </tr> </table> </div> <p><i>() terminal designation of connector</i></p>	CH	(4)		⊙	(3)	CL	(2)	GND/COM	(1)
CH	(4)									
⊙	(3)									
CL	(2)									
GND/COM	(1)									

To activate the terminating resistor, the jumper at terminal J4 (ZAdynpro 011-032) or J1 (ZAdynpro 040-074) must be connected to the two right pins (see Fig.).



Jumper

☞ For more detailed information on CANopen lift, see chapter "Serial communication/CANopen lift" in part 2. of the operating instructions.

DCP (for ZAdynpro xxx DCP only):

Designation of the connection terminal:	X-CAN
Line cross-section:	
Type of cable:	<ul style="list-style-type: none"> • Shielded line
Cable lengths:	<ul style="list-style-type: none"> • Max. 50 m
Connection type:	Screw terminals
Connection:	<ul style="list-style-type: none"> • The connection between the ZAdynpro and the control system should be set up without additional terminal points. <div style="text-align: center;"> <p>X-CAN</p> <p>() terminal designation of connector</p> </div>

☞ For further information on DCP, see "Serial communication / DCP (Drive Control & Position)" chapter in the operating instructions - Part 2.

5.13 STO interface (X-STO)

The following points must be observed when switching and wiring the STO signals:

- Separate relays must be used for every input for switching the STO signals (two-channel activation).
- When wiring the STO signals, short-circuits and external shorts must be ruled out on power lines and terminal points because the internal diagnostics of the ZAdynpro does not detect any short-circuits on the power lines:
 - Outside the switch cabinet, the STO line must be permanently laid (fixed) and protected against external damage (e.g. cable duct, armoured tube or similar). If separate jacketed cables are used for the STO_A and STO_B signals, the cables must not be laid with protection (according to ISO 13849-2).
 - Air and creep distances of at least 2 mm must be kept between the STO_A, STO_B and +24V_STO signals according to EN81 (e.g. at terminal points).
 - Terminals which comply with a CENELEC or IEC standard must be used.
 - The wiring technique must be compliant with DIN EN 60204-1.
- External shorts must be ruled out in the exciter voltage of the relays that actuate the STO inputs (end of the safety chain).
- Supply cables (power cable, motor cable) and STO cables must be laid separately.

The relays used to activate the STO inputs must meet the following requirements:

Rating:	According to the technical data of the STO inputs: Typ. 24 V/12 mA
Switching voltage:	Min. 60 VDC
Relay contacts:	Recommended: Relays with hard-gold-plated contacts
Isolation:	Safe disconnection between coil and contacts according to EN 60664-1 or equivalent standard.
Interference immunity:	Sufficient interference immunity to interference voltages on the control side (coil), such as for capacitive couplings in long control lines. If in doubt, use a relay with increased drop voltages (such as Phoenix Contact series PLC-...SO46, Finder series 38.51.3 or comparable).

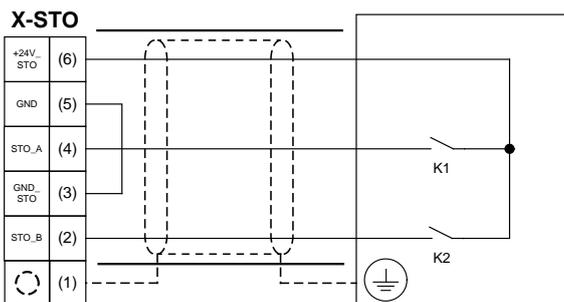


Danger!

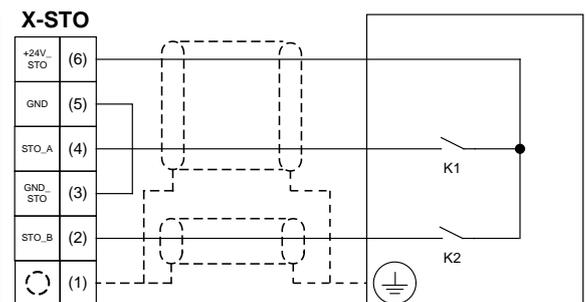
If you use an external voltage source instead of the internally generated 24-V voltage (X-STO: +24V_STO) to actuate the STO inputs, you must use a voltage source with low voltage and safe electrical disconnection (SELV/PELV).

See the chapter "Safe Torque Off(STO) function" for further information.

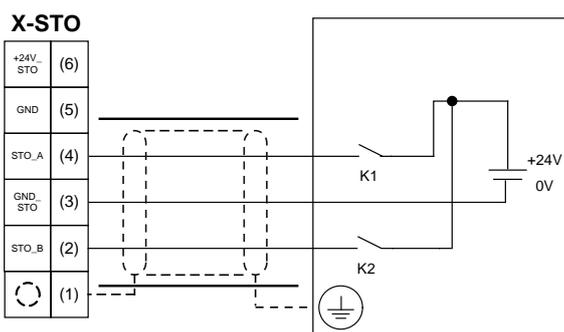
Designation of the connection terminal:	X-STO	
Technical data:	Voltage range	0...30 VDC
	Switching level LOW / HIGH	0 V < LOW < 3 VDC 15 V < HIGH < 30 VDC, typical: 24 VDC
	Current consumption at 24 VDC	typ. 12 mA per input
Line cross-section:	min. 0.25 mm ² ...max. 2.5 mm ²	
Type of cable:	<ul style="list-style-type: none"> • Shielded lines • Apply shielding on both sides • ZAdynpro shield coating version: Connection of pigtail to terminal 1 of connection terminal X-STO 	
Cable lengths:	Max. 50 m	
Connection type:	Screw terminals	
Connection:		



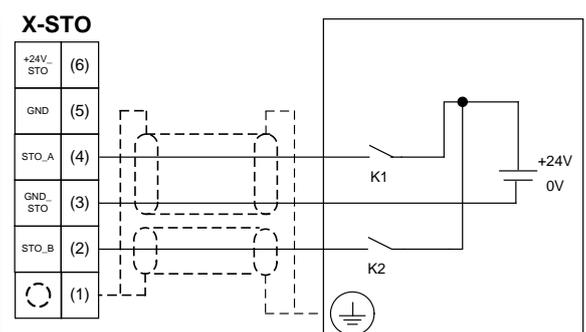
Connection with internal 24 V voltage and protected routing
 1 Control



Connection with internal 24 V voltage using two separate jacketed cables
 1 Control



Connection with external 24 V voltage and protected routing
 1 Control
 2 External voltage source SELV/PELV

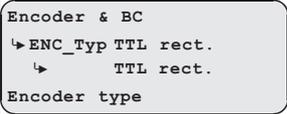
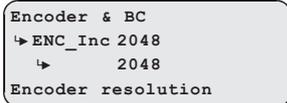


Connection with external 24 V voltage using two separate jacketed cables
 1 Control
 2 External voltage source SELV/PELV

Terminal assignment X-STO

no.	Designation	Function
6	+24V_STO	24VDC output voltage (to be used only for activation of the STO inputs, do not connect any additional loads)
5	GND	Reference potential 24VDC output voltage
4	STO_A	Input STO A
3	GND_STO	Reference potential, inputs STO_A/B
2	STO_B	Input STO_B
1		Shielding

5.14 Connection of asynchronous motor rotary encoder (X-ENC15)

Designation of the connection terminal:	X-ENC15	
Connection type:	D-Sub, 15-pin, in two rows	
Cable lengths:	Max. 25 m	
Type of cable:	Shielded twisted pair cable	
Technical data:	Type:	Incremental counter TTL
	Signal shape:	Right angle, Sin/Cos
	Operating voltage:	5 VDC
	Resolution:	64 ... 4096 pulse / revolution
	Input resistor	120 Ω
	Cut-off frequency	200 kHz
	TTL differential frequency (against GND)	Ulow ≤ 0.5 V Uhigh ≥ 2.5 V
	Sine differential signal (at 2.5 V offset against GND)	0,6 Vss ... 1,2 Vss (typ. 1Vss)
Parametrisation:	Before the rotary encoder is plugged in/connected, the rotary encoder type and resolution used must be configured in the "Encoder & BC/ENC_TYP" and "Encoder & BC/ENC_INC" menu.	
		

5.14.1 X-ENC15 pin assignment

1	-	-
2	-	-
3	-	-
4	+5 V_E	Voltage supply
5	DGND	Earth
6	-	-
7	B	Track B
8	-	-
9	-	-
10	-	-
11	-	-
12	A	Track A
13	/A	Track A inverse
14	/B	Track B inverse
15	DGND	Earth

Housing		Shielding
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5.15 Rotary encoder connection for synchronous motors (X-ENC15)

Designation of the connection terminal:	X-ENC15	
Connection type:	D-Sub, 15-pin, in two rows	
Cable lengths:	Max. 25 m	
Type of cable:	Shielded twisted pair cable	
Technical data:	Type:	Rotary encoder, absolute
	Interfaces:	EnDat 01 SSI Sin/Cos BiSS-C Hiperface
	Resolution:	512 ... 4096 pulse / revolution
	Input resistor	120 Ω
	Cut-off frequency	200 kHz
	Sine differential signal (at 2.5 V offset against GND)	0,6 V _{ss} ... 1,2 V _{ss} (typ. 1V _{ss})
	Parametrisation:	<p>Before the rotary encoder is plugged in/connected, the encoder type and resolution used must be configured in the "Encoder & BC/ENC_TYPE" and "Encoder & BC/ENC_INC" menus.</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid gray; padding: 5px; width: 45%;"> <pre>Encoder & BC ↳ ENC_Typ EnDat/SSI ↳ EnDat/SSI Encoder type</pre> </div> <div style="border: 1px solid gray; padding: 5px; width: 45%;"> <pre>Encoder & BC ↳ ENC_Inc 2048 ↳ 2048 Encoder resolution Imp/Rev</pre> </div> </div>

5.15.1 EnDat 01, SSI, SIN/COS, BiSS-C pin assignment, Hiperface interface

1	DATA	Data line
2	/DATA	Data line inverse
3	/D	Analog track D inverse
4	+5 V_E	+5/8V voltage supply (power supply is switched off if the rotary encoder is missing)
5	DGND	Earth
6	/C	Analog track C inverse
7	B	Analog track B
8	C	Analog track C for transmitting position
9	/CLK	Clock signal invers
10	CLK	Clock signal for serial transfer
11	D	Analog track D for transmitting position
12	A	Analog track A
13	/A	Analog track A inverse
14	/B	Analog track B inverse
15	DGND	Earth
Housing		Shielding

5.16 Rotary encoder simulation (X-ENCO)

- The rotary encoder simulation transforms the signals of the rotary encoder mounted on the motor into differential signals according to ANSI standard RS422. The resolution of the rotary encoder simulation is identical to the resolution of the rotary encoder.
- As a result of the connection of an external 24 V voltage source to terminal +24V_EXT, the rotary encoder simulation is active even when the ZAdynpro is switched off.

Designation of the connection terminal:	X-ENCO	
Line cross-section:	max. 1.5mm ²	
Type of cable:	Shielded twisted pair cable	
Connection type:	Screw terminals	
Technical data:	Output signal high	min. 2,8 V / 8 mA
	Output signal low	max. 0,4 V / 4 mA
	Rload	≥ 120 Ω
	Short-circuit-proof	No
Connection:	<div style="text-align: center;"> <p>X-ENCO</p> </div> <p>Connection of rotary encoder simulation <i>1 Signals depending on the rotating direction of the motor (with view to the power take-off side)</i> <i>() terminal designation of connector</i></p>	

5.17 External 24 V voltage supply (X-ENCO)

By applying an external 24 V voltage supply to terminal X-ENCO, the following functions are active even when the ZAdynpro is switched off:

- Rotary encoder simulation
- ZApad (parameter changes are possible)
- USB interface of the ZApad



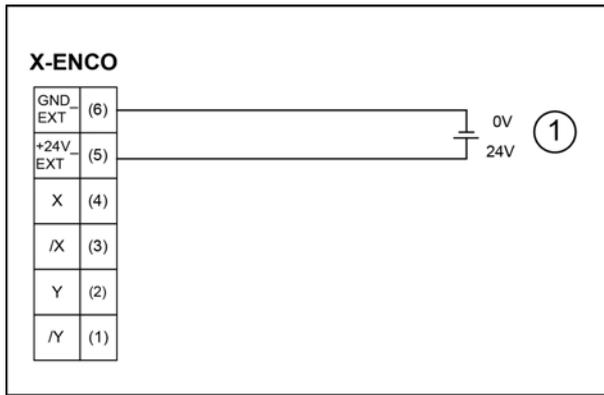
Information

The external 24-V power supply may only be switched on if the mains connection voltage is not applied.

5.17.1 Technical data

Voltage range	23 ... 26 V
Current consumption	370 mA

5.17.2 Connection X-ENCO



Connection external power supply

1 external power supply

() terminal designation of connector

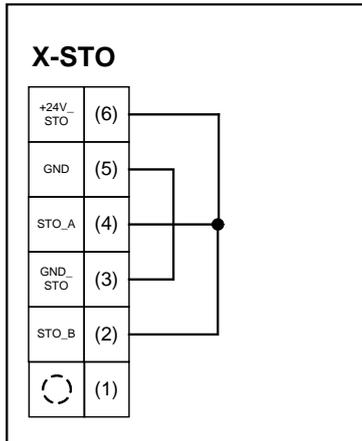
5.18 Standby input (X-SBY)

- By applying a 24-V voltage, the standby mode of the ZAdynpro is activated.
- In the stand-by mode, the controller units and the ZApadpro are switched off.
- After the stand-by mode has been deactivated, it takes about 10 seconds for the ZAdynpro to be operational again.

Name:	Standby input	
Symbol:	X-SBY	
Technical data:	Voltage range:	+20...28 VDC
	Switching level low/high	<5 VDC />15 VDC
	Current consumption at 24 V	typ. 8 mA
Line cross-section:	max. 1.5 mm ²	
Type of cable:	Not shielded	
Cable lengths:	Max. 25 m	
Connection type:	Screw terminals	
Connection:		

5.19 Motor contactors (optional)

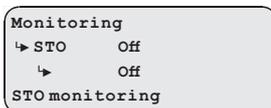
The STO connection must be bridged if motor contactors are used (see fig.).



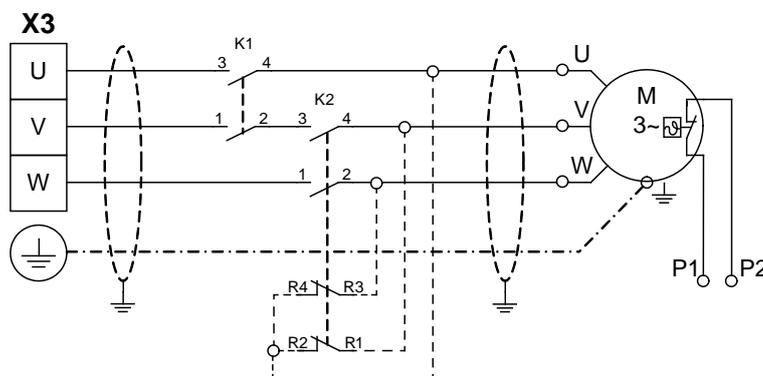
STO connection bridged

The monitor of the STO function must also be deactivated.

The STO function is activated/deactivated in the **Monitors/STO** menu.



The maximum cable length to the motor contactors for non-shielded lines is **200 mm**. Shielded lines must be used if there is a greater distance between the contactors and the ZAdynpro.



Synchronous motor connection

1 Bridges can be omitted for asynchronous motors



Information



If an emergency evacuation is carried out by opening the brakes, the motor windings should be short-circuited for the evacuation to prevent an uncontrolled acceleration of the elevator. The short-circuit generates a speed-dependent braking torque, sufficient in most cases to reduce the elevator speed to a safe level.

CAUTION!

If operating with synchronous motors from other manufacturers, you have to ensure that a manually emergency evacuation is approved.

5.19.1 Monitoring of the motor contactors (X-BR)



Danger!

The use of motor contactors is only allowed with connected and activated contactor monitoring.



Information

The switching states of the motor contactors must be monitored according to EN 81-20. The ZAdynpro contactor monitoring is no substitute for this monitoring of the motor contactors demanded in EN 81-20!

General

- The ZAdynpro monitors the switching status of the motor contactors. The contactors must be retracted during travel. Opening the contactors during travel (e.g. through bar impacts) will lead to immediate interruption of the travel.
- The contacts for monitoring the motor contactors are arranged in series.

Designation of the connection terminal:	X-BR											
Number of inputs	1											
Technical data:	Monitoring voltage range	+22 ... 26 VDC										
	Current consumption at 24 V	10 mA (-20%)										
	Switching level low/high	<5VDC / >11 VDC										
Contact type:	Normally open contact (NO)											
Line cross-section:	max. 1,5 mm ²											
Type of cable:	<ul style="list-style-type: none"> • Individual conductors • Not shielded 											
Cable lengths:	Max. 25 m											
Connection type:	Screw terminals											
Parametrisation:	<p>The contactor monitoring is activated/deactivated in the Control system/f_XBR3 menu.</p> <div style="border: 1px solid gray; padding: 5px; width: fit-content;"> <pre>Control ↳ f_XBR3 44: ↳ 47: CO Function of input BR3</pre> </div>											
Connection:	<div style="text-align: center;"> <p>X-BR</p> <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>GND</td><td>(1)</td></tr> <tr><td>BR3</td><td>(2)</td></tr> <tr><td>BR2</td><td>(3)</td></tr> <tr><td>BR1</td><td>(4)</td></tr> <tr><td>+24V_OUT</td><td>(5)</td></tr> </table> </div> <p>Connection internal contactor monitoring – series circuit <i>() terminal designation of connector</i></p>		GND	(1)	BR3	(2)	BR2	(3)	BR1	(4)	+24V_OUT	(5)
GND	(1)											
BR3	(2)											
BR2	(3)											
BR1	(4)											
+24V_OUT	(5)											



Information

The internal 24 V power supply is only provided for the inputs of the ZAdynpro. Switching consumers with this voltage is not permitted!

5.20 Brake release monitoring (X-BR)

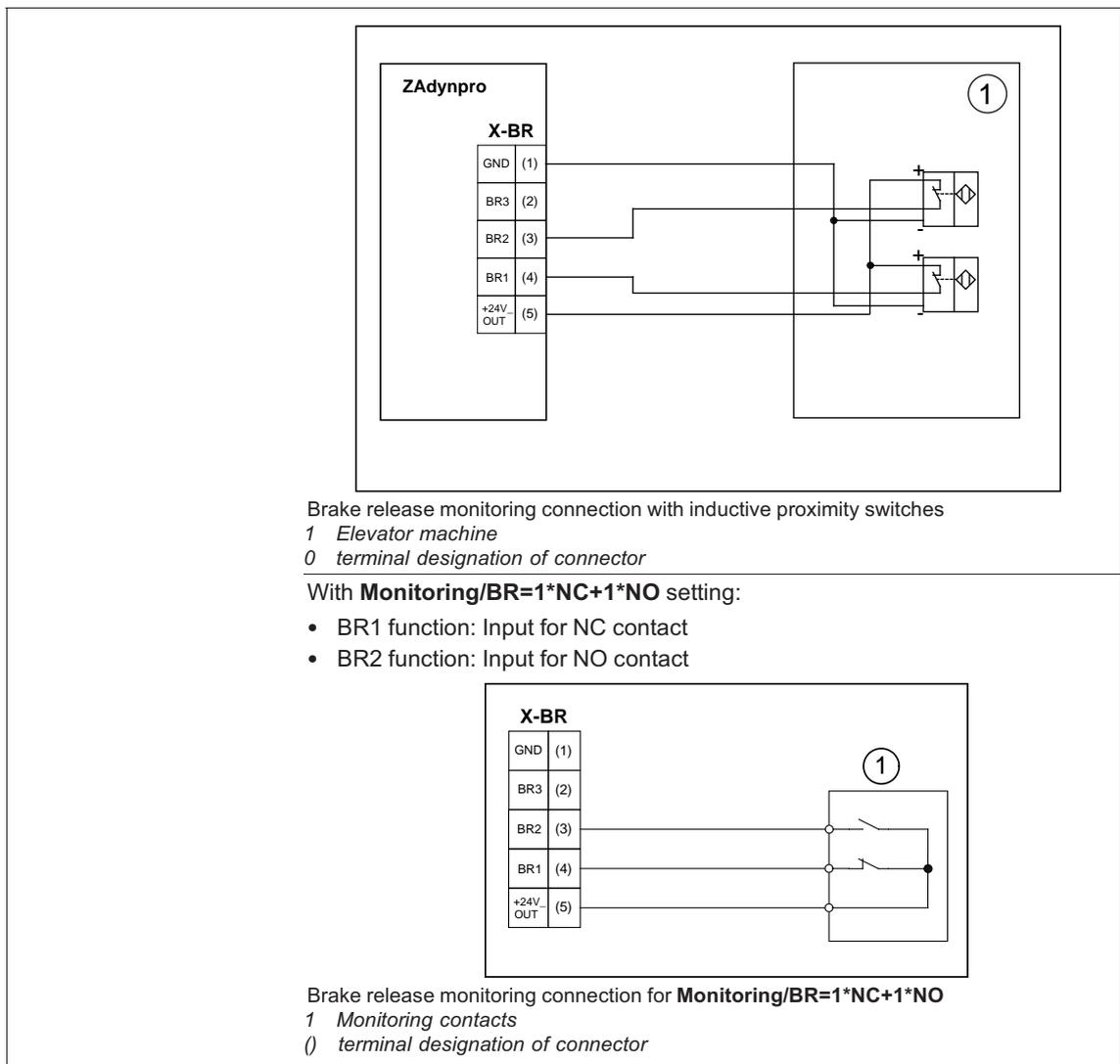
- The brake release monitoring serves as monitoring for redundancy and the operation status of the brakes.
- It is recommended that the brake release monitoring be connected to the ZAdynpro for optimum starting and stopping.



Information

When the lock function is activated, the brake release monitor meets the self-monitoring requirements according to EN 81-20 Chapter 5.6.6.2 for protection devices for the cabin moving upwards against overspeeding and Chapter 5.6.7.3 as a protection device against unintended cabin movement.

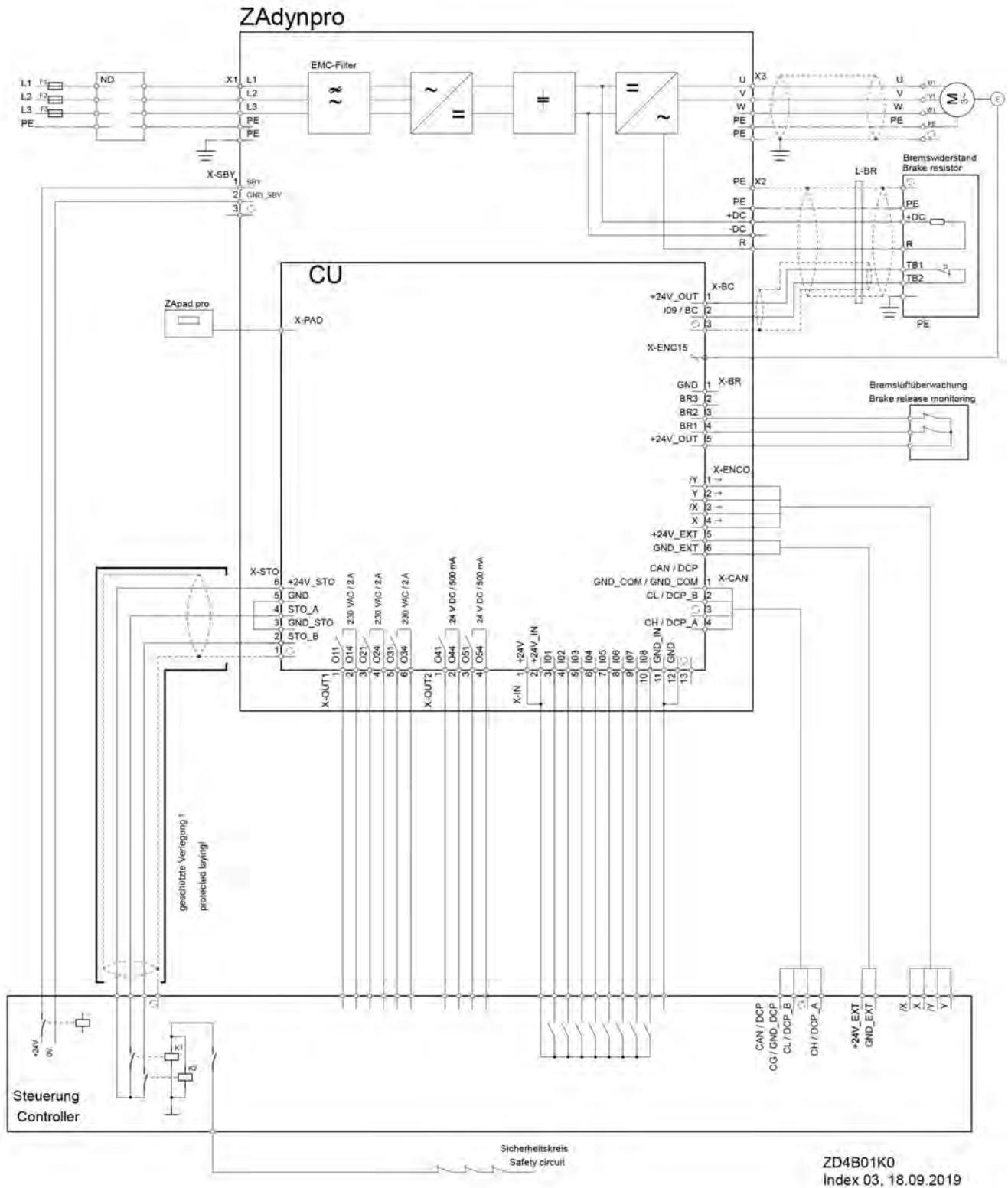
Designation of the connection terminal:	X-BR											
Number of inputs	3											
Technical data:	Monitoring voltage range	+22 ... 26 VDC										
	Current consumption at 24 V	10 mA (-20%)										
	Switching level low/high	<5VDC / >11 VDC										
Contact type:	Normally open contact (NO) or normally closed contact (NC)											
Line cross-section:	max. 1,5 mm ²											
Type of cable:	Not shielded											
Cable lengths:	Max. 25 m											
Connection type:	Screw terminals											
Parametrisation:	<p>The contactor monitoring can be activated/deactivated in the menu Monitoring.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <pre>Monitoring ↳ BR 1*NC ↳ 3*NC Brake control</pre> </div> <p>The lock function of the ZAdynpro is engaged by activating the LOCK_X=On parameter in the menu Monitors.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <pre>Monitoring ↳ LOCK_X Off ↳ On Lock on malfunction</pre> </div> <p>Activation of the parameter ensures that the ZAdyn locks upon detection of a faulty brake circuit.</p> <p>The ZAdynpro lock can only be released by setting the Monitors/UNLOCK = On parameter.</p>											
Connection:	<div style="text-align: center;"> <p>X-BR</p> <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td>GND</td><td>(1)</td></tr> <tr><td>BR3</td><td>(2)</td></tr> <tr><td>BR2</td><td>(3)</td></tr> <tr><td>BR1</td><td>(4)</td></tr> <tr><td>+24V_OUT</td><td>(5)</td></tr> </table> </div> <p>Connection of brake release monitor with micro switches 1 Monitoring contacts () terminal designation of connector</p>		GND	(1)	BR3	(2)	BR2	(3)	BR1	(4)	+24V_OUT	(5)
GND	(1)											
BR3	(2)											
BR2	(3)											
BR1	(4)											
+24V_OUT	(5)											



Information

The internal 24 V power supply is only provided for the inputs of the ZAdynpro. Switching consumers with this voltage is not permitted!

5.21 ZAdynpro circuit suggestion



6 Operating and display elements

6.1 Options for control

To operate and configure the ZAdynpro, the following control options are available:

- ZApadpro control terminal
- Remote control via ZAmon software
- Remote control via the elevator controller display



Information

If the ZAdynpro is remotely operated via the display of the lift control unit when communicating via CANopen Lift or DCP, the keys of the ZApadpro are deactivated. The keys can be activated by pressing the  button for 3 seconds.

6.1.1 ZApadpro control terminal

The ZApadpro is a control module independent of the ZAdynpro. Remote control of the ZAdynpro is possible when a longer connection line is used.

6.1.1.1 Mounting / Fastening

ZAdynpro 011-032: The ZApadpro is inserted into the recess on the lid and pressed in.



ZApadpro on the front



ZApadpro on the right-hand side

ZAdynpro 040-074: The ZApadpro is fixed to the housing of the ZAdynpro using three magnetic strips. The magnetic strips are included and are stuck into the three recesses on the bottom of the ZApadpro.



6.1.1.2 Connection

The RJ-45 socket of the control terminal and of the ZAdynpro (X-PAD) are used for connection.

Connection

Line cross-section:	>= AWG26
Type of cable:	CAT5 network cable, 8-core
Cable lengths:	Max. 50 m
Connection type:	both sides RJ-45 plug, 8-pole



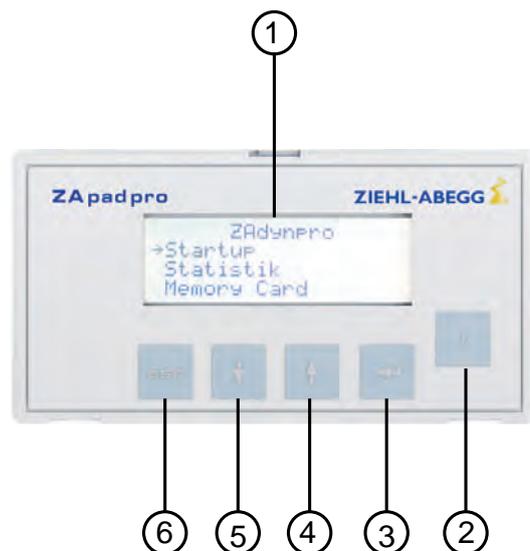
Connection ZApadpro on ZAdynpro 011-032



Connection ZApadpro on ZAdynpro 040-074

6.2 Menu navigation

6.2.1 ZApadpro and ZAmon control interface



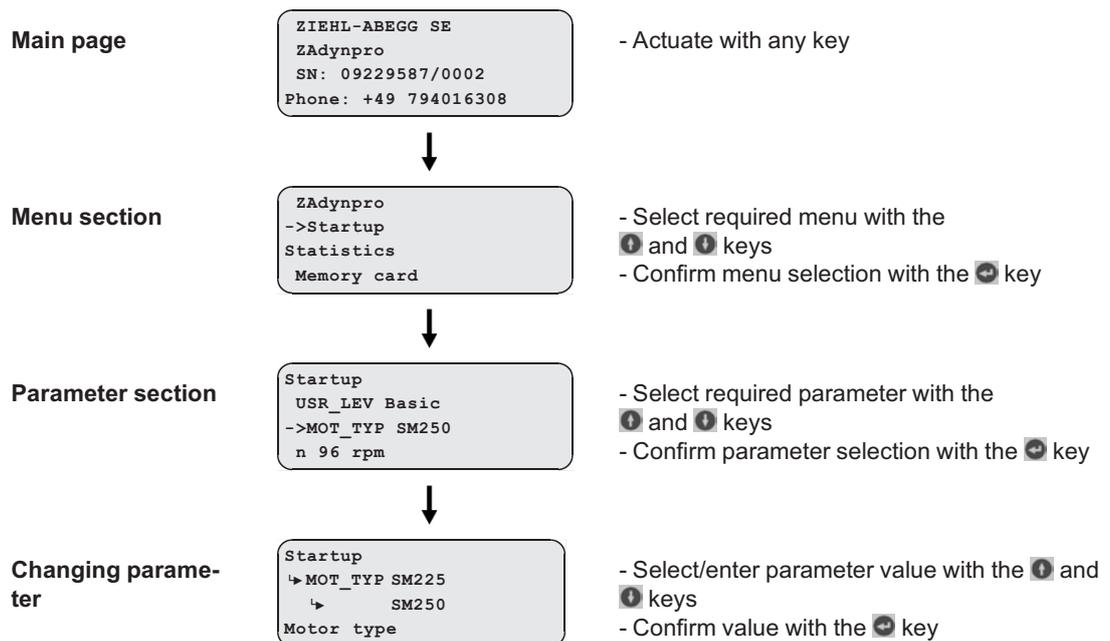
ZApadpro and ZAmon control interface

- 1 Display
- 2 i key
- 3 Enter key
- 4 Arrow UP key
- 5 Arrow DOWN key
- 6 ESC key

6.2.2 Control key functions

	<ul style="list-style-type: none"> • back to menu selection • Back to parameter selection • Negation of yes-no queries • Cancel
	<ul style="list-style-type: none"> • Confirming menu selection • Confirming parameter values • Confirming parameter values • Affirmation of yes-no queries
	<ul style="list-style-type: none"> • Menu selection • Parameter selection • Increasing parameter values
	<ul style="list-style-type: none"> • Menu selection • Parameter selection • Reducing parameter values
	<ul style="list-style-type: none"> • Show / exit INFO menu • Display of current operational states

6.2.3 Menu and parameter navigation



6.2.4 The different operating levels

The firmware of the ZAdynpro is divided into two control levels:

Basic Level

- Three menus are available here: **Startup**, **Statistics** and **Memory card**.
- Starting up takes place exclusively in the **Startup** menu.

Advanced Level

- In the advanced level, all parameters are displayed. The parameters are described in the chapter "Parameter list".
- Depending on the parameterisation, unneeded parameters are hidden automatically to give a better overview.
- You can switch between Basic-Level and Advanced-Level by a long press of the  key.
- The level which is active after the controller start can be set by the parameter **LCD & Password/USR_LEV**.

6.2.5 Meaning of the arrows appearing in the display:

<pre>Motor-Typenschild → Encoder & BC Anlage-daten Steuerung</pre>		Selecting a menus in the menu level
<pre>Motor-Typenschild n 128 rpm ↳ f 18.0 Hz n* 94 rpm I 40.4 A</pre>		Selecting changeable parameters in the menu
<pre>Anlage-Daten MOD_n* Mit D..i2 n* 94 rpm __D 0.240 m</pre>		Selected parameter can be modified, but is blocked at the moment. The block can be implemented by assigning a password or functionally (dependent on another parameter)
<pre>Start T_2 1.0 s T2_real 0.8 s T_3 0.1 s</pre>		Value / function of a parameters is only displayed for informational purposes and cannot be modified.
<pre>Serial-No-----01 ZAdynpro 013 SN:06128238/0001 3.17-1037</pre>	i Zahl	Current position (page number) in the INFO-menue
<pre>MMC-Recorder REC_MOD On REC_CFG 0 REC_NUM 0</pre>	<input type="checkbox"/>	The recorder for recording measurements on the memory card is activ
<pre>Start T_2 1.0 s T2_real 0.8 s T_3 0.1 s</pre>	ERR	ZAdynpro fault The ZAdynpro must be deactivated

6.3 Entering numerical values

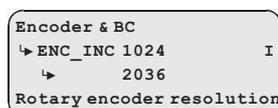
Entering numerical parameter values can be done in two different ways:

6.3.1 Continuous change of a parameter value

After selecting the parameter, the parameter value can be set by continuously changing the numerical value using the  &  key.

Short keypress: Number is incremented/decremented by 1

Long push on the key: Number automatically increases/decreases until the key is released.

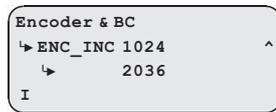


6.3.2 Changing individual digits

When changing a parameter by a large value, it is possible to change the individual digits separately

After parameter selection, the desired digit can be selected with the **1** key and then changed between 0 and 9 using the **0** & **9** keys.

The selected digit is marked with an arrow.



6.4 LED

There is an LED on the ZAdynpro for diagnosis.



1 Location of LED ZAdynpro 011-032



1 Location of LED ZAdynpro 040-074

Status of the ZAdynpro with standard actuation

LED colour	LED status	Operation condition
green	flashing once per second	Standstill
green	flashing twice per second	Travel

Condition of the DCP connection

LED colour	LED status	Operation condition
red	fast flashing	With activated DCP function, the DCP connection is not present or is defective
green	On	With activated DCP function, the DCP connection is flawless
red / green	Slow alternating flashing	The DCP function is not activated in a trouble-free DCP connection (only DCP3/DCP4)

Condition of the CAN connection

LED colour	LED status	Operation condition / error status
green	flashing once per second	Operation Mode "Stopped"
green	fast flashing	Operation Mode "Preoperational"
green	On	Operation Mode "Operational"
red	Off	no error, connection is in order
red	flashing once per second	CAN error counter has exceeded the warning limit of 96 errors
red	On	Bus off, reset of the controller is necessary

It is possible, that an operation condition and an error state occur at the same time and that they are indicated by the LED at the same time.

6.4.1 Software update

If an error occurs during the software update, a flash code is issued by LED for the corresponding error message.

An explanation of the flash code can be found in the chapter Special Functions/Software Update

7 Commissioning

7.1 General



Danger!

Defective connections can cause the motor to start unexpectedly or lead to uncontrolled motor movements.

Reversed connections cause the motor to rotate in the wrong direction. That can cause serious machine damage.

CAUTION!

Caution!

Incorrectly wired connections can destroy the electrical/electronic components.

Electrostatic discharges can be hazardous to the electronic components and lead to errors in the software.

You must comply with the following points to prevent machine damage or life-threatening injuries when commissioning the machine:

- Only suitably qualified personnel are to be entrusted with the commissioning of the device. They must comply with the safety instructions.
- Before starting work, make sure all tools and external parts have been removed from the machine.
- Activate all safeguards and the emergency-off switches before commissioning.
- Make sure no unauthorized persons are in the machine working area and that no other persons can be endangered when the installation is started up.
- inspect the electrical connections before the first start
- Pay special attention to the protective measures (e.g. grounding, ...) for the electrostatically endangered components.
- Also read the chapter "General Safety Instructions".

7.2 Configuring the ZAdynpro

- Synchronous motors:
 - Loading parameters from the absolute encoder
 - Manual parameter setting
- Asynchronous motors: Manual parameter setting

7.2.1 Loading parameters from the absolute encoder



If no system data is available ("0" entered for n* and V*), a query appears as to whether the following parameters are to be loaded from the absolute encoder:

```
ZAdyn without parame-
parameters!
Attempt
to take data from en-
coder?
No Yes
```

- | | | | | | |
|-----------|-----------|----------|-----------|----------|-----------|
| • cos phi | • Q | • P_BR | • T_I_MAX | • V_1 | • F_PAR2 |
| • MOT_TYP | • f | • M_MAX | • MASK1 | • V_2 | • U_ACCU |
| • TYP | • G | • CONFIG | • MASK2 | • V_I | • P_UPS |
| • MO_DR | • A_POS | • V_G1 | • MASK3 | • R_NEG1 | • R_U20 |
| • MOD_n* | • A_NEG | • SIM_V1 | • MASK4 | • R_NEG2 | • ENC_OFF |
| • _is | • ENC_TYP | • STO | • MASK5 | • T_5 | • BD_RATE |
| • _D | • ENC_INC | • CO | • M_START | • T_5a | • f_I08 |
| • I1 | • BC_TYPE | • BR | • K_START | • T_5b | |
| • I2 | • R_BR | • P1P2 | • T_2 | • SPD_KP | |
| • V_3 | • T_3 | • I_MAX | • V_T3 | • SPD_TI | |

"Yes": The parameters are loaded from the absolute encoder to the ZAdyn.

"No": The ZAdyn must be manually configured as described in the chapter "Manual parameter setting on the ZAdyn".

7.2.2 Manual parameter setting on the ZAdyn

1.	Select Startup menu	ZAdynpro ->Startup Statistics Memory card
2.	Select the LANG parameter Choose language The languages German and English are integrated as standard. A third language can be loaded with the memory card.	Startup ↳ LANG German ↳ English Language
3.	Select parameter USR_LEV The level which is active after the controller start can be set with the parameter USR_LEV .	Startup ↳ USR_LEV Basic ↳ Advanced User Level
4.	Select parameter MOT_TYP Enter the operated motor type	Startup ↳ MOT_TYP SM 200 ↳ SM 200 motor
5.	Select parameter n Enter the motor's rated speed	Startup ↳ n 72.0 rpm ↳ 72.0 Rated speed

6.	Select parameter f Enter the motor's rated frequency	Startup ↳ f 18.0 Hz ↳ 18.0 Rated frequency
7.	Select parameter I Enter the motor's rated current	Startup ↳ I 13.7 A ↳ 13.7 Rated current
8.	Select parameter U Enter the motor's rated voltage	Startup ↳ U 360 V ↳ 360 Rated voltage
9.	Select parameter P Enter the motor's rated power	Startup ↳ P 5.5 kW ↳ 5.5 Power
10.	Select parameter cos phi Enter power factor of the motor A Possible only for asynchronous motors	Startup ↳ cos phi 0.75 ↳ 0.75 Power factor
11.	Select parameter TYP Choose connection type of the motor	Startup ↳ TYP Star ↳ Triangle Connection type
12.	Select parameter ENC_TYP Enter the type of encoder used	Startup ↳ ENC_TYP EnDat/SSI ↳ EnDat/SSI Encoder type
13.	Select parameter ENC_INC Enter the encoder resolution	Startup ↳ ENC_INC 2048 INC ↳ 2048 Rotary encoder resolution
14.	Select parameter BC_TYP Enter the used brake resistor or brake chopper	Startup ↳ BC_TYPE BR11 ↳ BR11 BR/BC - Type
15.	Select parameter V* Enter the installation rated speed	Startup ↳ V* 1.00 m/s ↳ 1.00 Nominal speed
16.	Select parameter _D Enter the diameter of the traction sheave	Startup ↳ _D 0.315 m ↳ 0.400 Driving disk diam.
17.	Select parameter _is Enter the installation's type of suspension	Startup ↳ _is 1:1 ↳ 1:1 Suspension
18.	Select parameter _i1 Input of i1 of the gearbox ratio i1:i2 A Possible only for asynchronous motors	Startup ↳ _i1 23.00 ↳ 23.00 Gearbox i1:i2

<p>19.</p>	<p>Select parameter __i2 Input of i2 of the gearbox i1:i2 A Possible only for asynchronous motors</p>	<pre>Startup ↳ __i2 1 ↳ 1 Gearbox i1:i2</pre>
<p>20.</p>	<p>Select parameter Q Enter the elevator installation's rated load</p>	<pre>Startup ↳ Q 600 kg ↳ 600 Nominal load</pre>
<p>21.</p>	<p>Select parameter CONFIG Configuration of the digital inputs according to the used control system and type of communication</p>	<pre>Startup ↳ CONFIG 01: ZA_IO ↳ 01: ZA_IO Configuration</pre>
<p>22.</p>	<p>Select parameter MO_DR Changing the rotating direction of the motor It must be observed that with triggering the input RV1 the cabin drives upwards</p>	<pre>Startup ↳ MO_DR Left ↳ Left Motor rotation direction</pre>
<p>23.</p>	<p>Select parameter BR Definition of the brake monitoring</p>	<pre>Startup ↳ BR Off ↳ 3*NO Brake control</pre>
<p>24.</p>	<p>Select parameter P1P2 Motor temperature monitoring</p>	<pre>Startup ↳ P1P2 Off ↳ PTC Motor temp. monitor</pre>
<p>25.</p>	<p>Select parameter K_START Amplification at start (see chapter "List of parameters/menu start-up")</p>	<pre>Startup ↳ K_START 1.0 ↳ 1.0 Control vers. at start</pre>
<p>26.</p>	<p>Select parameter SPD_KP Multiplication factor to modify the calculated basic amplification SPD_C</p>	<pre>Startup ↳ SPD_KP 1.00 ↳ 1.00 Controller basic gain</pre>

7.3 Testing the “Safe Torque Off” function (STO)

In the course of start-up, the "Safe Torque Off (STO)" function must be tested as a safety function test. Proceed as follows:

Test step	Result
Check the state of the two inputs STO_A and STO_B at standstill of the drive (no travel signals).	In the Info menu/Start/Stop , the STO_A and STO_B inputs must be marked as inactive by a small dot. A large dot must be visible next to the DIAG display.
Trigger application of a travel command, e.g. by briefly pressing the Recover UP or DOWN button.	In the Info menu/Start/Stop , the STO_A and STO_B inputs must be marked as active by a large dot. A large dot must be visible next to the DIAG display. Attention: As soon as the large dots are visible at STO_A and STO_B, remove the travel command.
At standstill of the drive (no travel signals), bridge the normally open contact of the relay for triggering the STO_A signal so that the STO_A input is activated.	In the Info menu/Start/Stop , the STO_A input must initially be marked as active by a large dot. A large dot must be visible next to the DIAG display. After a time of approx. 1 second, the displays for STO_A and DIAG change from a large dot to a small dot (all displays marked as inactive). The ZAdynpro triggers the "STO diagnostic" error (error 960). Then remove the bridge at the relay contact again. Then reset the error by switching the line voltage off/on.
At standstill of the drive (no travel signals), bridge the normally open contact of the relay for triggering the STO_B signal so that the STO_B input is activated.	In the Info menu/Start/Stop , the STO_A input must initially be marked as active by a large dot. A large dot must be visible next to the DIAG display. After a time of approx. 1 second, the displays for STO_A and DIAG change from a large dot to a small dot (all displays marked as inactive). The ZAdynpro triggers the "STO diagnostic" error (error 960). Then remove the bridge at the relay contact again. Then reset the error by switching the line voltage off/on.
At standstill of the drive (no travel signals), bridge both normally open contacts of the relay for triggering the STO_A/STO_B signals so that both inputs are activated.	The ZAdynpro triggers the "STO: Travel signal missing" error (error 349) after 2,5 s. Then remove the bridge at the relay contacts again.

If one of the test steps does not achieve the described result, please contact the ZIEHL-ABEGG customer service.

The test of the STO safety function should be repeated at regular intervals (e.g. annually during routine inspections).

7.4 Setting the switch-off points

7.4.1 Interrupt points for the travel speeds V_3 and V_2

The deceleration paths after V_1 or after standstill (in DCP2 and DCP4 protocol) can be read directly in the **Info menu/page 03**.

```
Dist. ----- 03
sa: 0.00 s21: 0.52m
sr: ^0.00 s31: 1.45m
s1: 0 sd: 0.52m
```

s31: Display of calculated deceleration path V_3 → V_1
s30: Display of calculated deceleration path V_3 → Standstill
s21: Display of calculated deceleration path V_2 → V_1
s20: Display of calculated deceleration path V_2 → Standstill

7.4.2 Cut-off points for travel speed V_1

To prevent the flush alignments from being travelled over, the switch-off points of V_1 must be set depending on the deceleration A_NEG at between **2 and 5 cm** before the flush alignment.

7.5 Carrying out the first test run



Danger!



Operating synchronous motors without encoder offset can cause uncontrolled motor movements

- The first trip must be carried out with the return control or as an inspection trip.
- If this trip can be carried out without any problems and without any fault messages, a normal trip can be made as the next step.
- If fault messages appear, an error list is available in the “Diagnose” chapter together with the corresponding error causes

7.6 Optimisation of the startup and drive behaviour

Roll back when starting up

Turning away when starting up is indicated by uncontrolled movement of the driving disc. The reason for this is insufficient amplification of the RPM controller at the time when the brake opens.

RPM controller

The **SPD_KP** (amplification) parameter can be used to optimise the setting of the RPM controller acting during travel.

1.	Select parameter Startup/SPD_KP Multiplication factor to modify the calculated basic amplification SPD_C	Startup ↳ SPD_KP 1.00 ↳ 0.95 Base gain-factor
2.	Increase of the parameter Startup/SPD_KP until the motor either no longer turns away or causes noises/vibrations when starting up.	Startup ↳ SPD_KP 1.00 ↳ 1.00 Controller basic gain
3.	If the motor causes noises/vibrations when starting up, decrease the parameter Startup/SPD_KP until the motor no longer causes any noises/vibrations.	Startup ↳ SPD_KP 1.00 ↳ 1.00 Controller basic gain

If the motor turns away when starting up despite optimum setting of the basic gain (parameter **Controller/SPD_KP**), this can be optimised by increasing the parameter **Startup/K_START**.

CAUTION!

Caution!

Before the parameter **Start-up/K_START** is increased, it must be ensured that the basic gain (**Control/SPD_KP**) is optimally configured!

4.	Select parameter " SPD_KP " Start gain Multiplication factor for the parameter Controller/SPD_KP or charge controller boost (depending on start-up mode)	<pre>Commissioning ↳ K_START 1.0 ↳ 3.0 Start gain</pre>
----	--	---

8 "Safe Torque Off (STO)" function

8.1 General

- The "Safe torque off (STO)" function in the ZAdynpro product series corresponds to the "Safe torque off (STO)" stop function in accordance with DIN EN 61800-5-2.
- Activation of this function ensures that the ZAdynpro cannot supply any energy to the motor which can cause a torque.
- The STO function allows the contactors that are usually installed between ZAdynpro and motor in lifts to be omitted. The requirements in accordance with EN 81-20 section 5.9.2.5.4 d) or section 5.9.3.4.2 d) are fulfilled.
- The STO function must be taken into consideration in an application-specific risk analysis by the company responsible for the start-up. This company is also responsible for considering other valid safety regulations as well as the definition of the requirements for the component which control the STO function in compliance with standards.



Danger

There is no active braking when the STO function is activated. The drive stops gradually. This must be taken into consideration in applications in which there might be a hazard (e.g. by vertical loads). Active braking must be implemented by additional measures (e.g. by a mechanical motor brake).

8.2 Safety concept

- The devices of the ZAdynpro series have two safety-related inputs (two-channel structure). The drive can only generate a torque when a 24V switching signal is applied to both of these inputs. When the two 24V switching signals are switched off, the STO function is activated and the activation of the switching transistors (IGBTs) is safely prevented.
- An internal diagnostic unit constantly compares the status of the two switch-off channels (STO_A and STO_B). If there is an error (unequal activation or an internal hardware defect), the internal diagnostic unit triggers switch-off of the drive.
- Both inputs must be activated via two separate relays whose control voltage is supplied at the end of the electrical safety chain (see Chapter "Safe torque off (STO) function/Principle circuit diagram").



Information

In the version according to the principle circuit diagram, monitoring of the two relays K1/K2 by the lift control system is not necessary in order to meet the requirements of EN 81-20. The requirements are met by the internal diagnostic unit.

- If the contacts are switched differently (e.g. one of the two relays does not open), this will be detected at the STO inputs by the different signals. In this case the internal diagnostic unit will turn off safely after a max. 1600 ms. In this case, a reset is only possible by switching the device off and on again.
- The status of the STO function can be queried optionally (not safety-related) via the digital output "STO-Info".



Danger

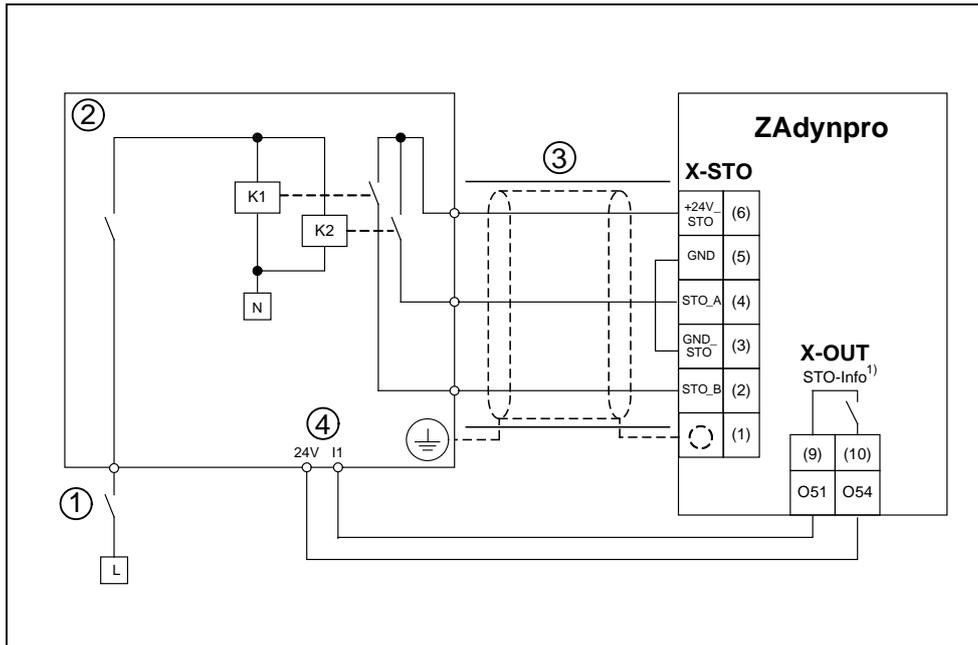
The connected motor is not separated from the ZAdynpro by activation of the STO function. Therefore, you must disconnect the ZAdynpro from the supply voltage in order to perform work on the wiring or the motor. You must wait at least 3 minutes for discharging the intermediate circuit capacitors. The safe isolation from the supply must be checked using a two-pole voltage detector.



Danger

If the drive is enabled again after being disabled by the STO function, the drive can restart automatically. If this is not admissible for the application, this must be implemented by external measures (restart e.g. only after confirmation).

8.3 Principle circuit diagram



Principle circuit diagram "Safe Torque Off (STO)" function

1 Electrical safety chain

2 Control

3 Protected routing or design with two separate jacketed cables (see chapter "STO interface (X-STO)")

4 Digital inputs control

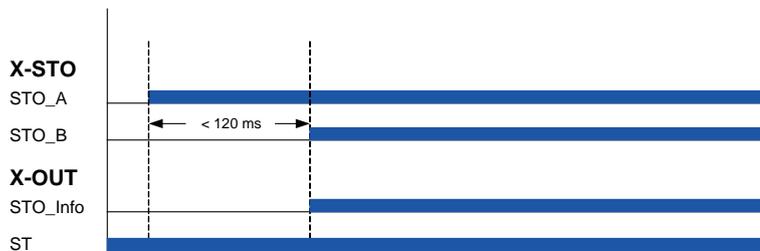
1) Information only, not safety-related

8.4 Electrical connection

The connection is made via the interface X-STO on the ZAdynpro (see chapter "Electrical installation / STO interface (X-STO)").

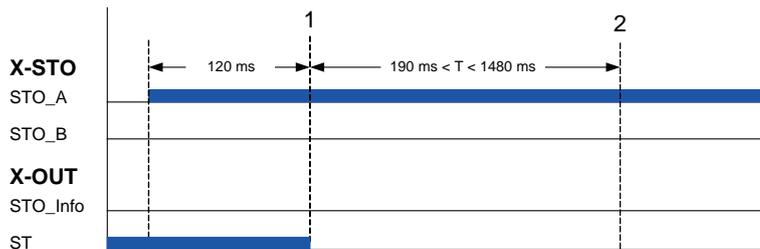
8.5 Notes for operation

- The two STO inputs must be switched simultaneously by separate relays with every travel (two-channel activation). Removal of one of the two STO_A or STO_B input signals already leads to switching off of the output stage.
- When switching the STO input signals STO_A / STO_B, a time offset of max. 120 ms is tolerated between the signals. With a greater offset the ZAdynpro first triggers the error "STO: fault" (error 533). This gives the elevator control system the option of aborting travel.
- If the actuation fault persists, safe switch-off is effected after a further min. 190 ms and max. 1480 ms (typically 630 ms) by the internal diagnostics (error 960 "STO: diagnostics").
- An error detected by the internal diagnostic (unequal activation or internal hardware defect) leads to a locked error state. The error can only be reset after switching the line voltage off/on.



Correct activation STO

- STO_A safety-related input STO_A
- STO_B safety-related input STO_B
- STO_Info inputs STO_A / STO_B active – enable output stage
- ST fault



Faulty activation STO

- 1 Error "STO: Fault"
- 2 Error "STO: Diagnostic"

The following times must be kept in operation for sufficient test coverage by the diagnostics.

- Activation STO (switch-off of STO_A and STO_B) at least once an hour for at least 1600 ms.

The correct activation of the STO inputs is monitored additionally (not safety-related) by the ZAdynpro for every journey:

- If the safe torque off is not cancelled (signals STO_A, STO_B remain LOW) at the beginning of travel after 2,5 s, the error "STO: Remains" (error 348) is triggered.
- If no safe torque off takes place (signals STO_A, STO_B remain HIGH) at the end of travel after 2,5 s, the error "STO: Missing" (error 532) is triggered.
- If the safe torque off is cancelled at standstill (no travel signals applied) (signals STO_A, STO_B become HIGH) and no travel signal is applied after 2,5 s, the error "STO: Travel signal missing" (error 349) is triggered.
- If the STO input signals are switched off during travel, the error "STO: Interruption" (error 531) is triggered after 200 ms.

During first-time start-up and the recurring tests, the function "Safe torque off (STO)" must be tested (see chapter "Start-up/testing the safety function "Safe torque off (STO)"")

8.6 Notes on use of motors



Danger

A brief aligning torque is possible in the event of an error. The motor can turn in the event of an error (defect of two or more power semiconductors) by a maximum angle $\varphi = 360^\circ/\text{number of poles}$.

- If there is a random component error on two or more circuit breakers of the inverter, there may be a brief alignment movement by a few degrees with permanently excited synchronous machines even when the STO function is activated. A permanent field of rotation cannot be generated. The effect of the aligning torque is described below.
- The maximum possible cabin movements allowed by the alignment torque can be calculated with the following formula:

$$\text{Cabin movement [mm]} = 3.142 \times \frac{\text{driving disk diameter [mm]}}{\text{Number of poles} \times \text{suspension}}$$

Examples for possible cabin movements depending on the motor, the driving disk diameter and the suspension can be found in the following table.

Examples of max. car movement in mm with number of poles 14

Ø driving disk	100 mm			120 mm			160 mm			200 mm			210 mm			240 mm			320 mm			400 mm			450 mm		
Suspension	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1
Cabin movement [mm]	23	12	6	27	14	7	36	18	9	45	23	12	48	24	12	54	27	14	72	36	18	90	45	23	10-1	51	26

Ø driving disk	480 mm			500 mm			520 mm			600 mm			680 mm		
Suspension	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1
Cabin movement [mm]	51	26	13	113	57	29	117	59	30	135	68	34	173	77	39

Examples of max. car movement in mm with number of poles 20

Ø driving disk	100 mm			120 mm			160 mm			200 mm			210 mm			240 mm			320 mm			400 mm			450 mm		
Suspension	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1
Cabin movement [mm]	16	8	4	19	10	5	26	13	7	32	16	8	33	17	9	38	19	10	51	26	13	63	32	16	71	36	18

Ø driving disk	480 mm			500 mm			520 mm			600 mm			680 mm		
Suspension	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1
Cabin movement [mm]	76	38	19	79	40	20	82	41	21	95	48	24	107	54	27

Examples of max. car movement in mm with number of poles 30

Ø driving disk	100 mm			120 mm			160 mm			200 mm			210 mm			240 mm			320 mm			400 mm			450 mm		
Suspension	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1
Cabin movement [mm]	11	6	3	13	7	4	17	9	5	21	11	6	22	11	6	26	13	7	34	17	9	42	21	11	48	24	12

∅ driving disk	480 mm			500 mm			520 mm			600 mm			680 mm		
Suspension	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1	1:1	2:1	4:1
Cabin movement [mm]	51	26	13	53	27	14	55	28	14	63	32	16	72	36	18

The cabin movement must be taken into consideration in a risk analysis of the complete system.

8.7 Deactivation of the STO function



Danger

There is no safety-related switch-off of the output stage when the STO function is deactivated. Safety switch-off in accordance with EN 81 must then be implemented by other measures (e.g. by motor contactors), (refer to chapter "Electrical installation/Motor contactors (optional)").

8.8 Testing the "Safe Torque Off (STO)" safety function

In the course of start-up, the "Safe Torque Off (STO)" function must be tested as a safety function test (see chapter "Start-up/Testing the Safe Torque Off (STO) Function").

8.9 Technical data

Safety characteristics	
Safety function	Safe torque off (STO) according to DIN EN 61800-5-2
Safety class	SIL 3 according to DIN EN 61800-5-2 ¹⁾ Satisfies the requirements in compliance with DIN EN 81-20, section 5.9.2.5.4 d) or section 5.9.3.4.2 d) ¹⁾
Probability of one dangerous failure per hour (PFH)	3.11E-10 per hour ²⁾
Mean time to dangerous failure of each channel (MTTFd)	410 years ²⁾
Diagnostic coverage (DC)	high
Switch-off time (duration from switching off the input signals to blocking the output stage)	< 50 ms
Minimum request rate for the STO function	Once an hour for at least 1600 ms
Life cycle	20 years, then the device must be replaced by a new one
max. permissible time delay between the signals STO_A / STO_B	max. 120 ms (on exceeding this, ZAdynpro outputs an error message, see chapter "Safe Torque Off (STO) Function / Notes on Operation")

¹⁾ TÜV Rheinland conducted type examination and certification for this. Copies of the test certificates can be requested from Ziehl-Abegg.

²⁾ assuming maximum device load for the entire life cycle

9 Enclosure

9.1 Technical data for ZAdynpro

	ZAdynpro				
	011	013	017	023	032
ZAdynpro article number	352250	352251	352252	352253	352254
Electrical data					
Mains connection voltage [V]	3~ 180 ... 440 absolut				
Mains frequency [Hz]	50 / 60 (±1,5 Hz)				
Typ. motor output (400 V) [kW]	4.6	5.5	7.5	11	14
Duty cycle at rated current and clock frequency 8 kHz [%]	40				
Nominal current for 40% duty cycle and switching frequency 8 kHz fixed [A]	11	13	17	23	32
Nominal current for 40% switch-on duration and switching frequency 12 kHz fix ¹⁾ [A]	9	11	15	20	27
Nominal current for 40% switch-on duration and switching frequency 16 kHz fix ¹⁾ [A]	8	10	13	17	23
Max. operating current (for max. 10 s) [A]	20	24	31	42	58
Power loss at nominal current, switching frequency 8 kHz and 40% duty cycle [W]	140	150	190	230	300
Power loss at nominal current, switching frequency 16 kHz and 40% duty cycle [W]	220	240	300	350	430
Power losses during standstill [W]	24	25	26	27	27
Power loss in standby [W]	≤ 3.0 W			≤ 6.0 W	
Switching frequency [kHz]	16				
Motor frequency [Hz]	max. 200				
Max. terminal cross-section line/motor/brake chopper/brake resistor [mm ²]	With wire end sleeve: 6 Without wire end sleeve: 10				
Ambient conditions					
The user must ensure that the specified ambient conditions are observed.					
Protection rating (as per DIN EN 60529)	IP20				
Ambient temperature for operation [°C]	0 ... 55, from 40 °C power reduction by 1.66% per 1 K temperature increase				
Relative humidity [%]	90 / condensation prohibited				
Installation height [m über NN]	bis 2000, ab 1000 m Leistungsreduzierung um 1% pro 100 m				
Storage and shipping temperature [°C]	-20 to +60				
Degree of soiling (in acc. with DIN EN 61800-5-1)	2				
Physical data					
Weight ZAdynpro [kg]	4.5	4.5	4.6	6.0	6.1
Dimensions h x w x d [mm]	290 x 150 x 195			390 x 151 x 195	

¹⁾ with a variable switching frequency (power component/M_PWM=AUTO menu), there is no reduction in power

	ZAdynpro			
	040	050	062	074
ZAdynpro article number	352255	352256	352257	352258
Electrical data				
Mains connection voltage [V]	3~ 180 ... 440 absolut			
Mains frequency [Hz]	50 / 60 (±1,5 Hz)			
Typ. motor output (400 V) [kW]	19	24	30	37
Duty cycle at rated current and clock frequency 8 kHz [%]	40			
Nominal current for 40% duty cycle and switching frequency 8 kHz fixed [A]	40	50	62	74
Nominal current for 40% switch-on duration and switching frequency 12 kHz fix ¹⁾ [A]	34	42	53	63
Nominal current for 40% switch-on duration and switching frequency 16 kHz fix ¹⁾ [A]	30	38	46	55
Max. operating current (for max. 10 s) [A]	72	90	112	134
Power loss at nominal current, switching frequency 8 kHz and 40% duty cycle [W]	320	410	500	610
Power loss at nominal current, switching frequency 16 kHz and 40% duty cycle [W]	460	580	710	850
Power losses during standstill [W]	28	30	33	33
Power loss in standby [W]	8	10	14	14
Switching frequency [kHz]	16	8		
Motor frequency [Hz]	max. 200			
Max. terminal cross-section line/motor/brake chopper/brake resistor [mm ²]	35 (with and without wire end sleeve)			
Ambient conditions				
The user must ensure that the specified ambient conditions are observed.				
Protection rating (as per DIN EN 60529)	IP20			
Ambient temperature for operation [°C]	0 ... 55, from 40 °C power reduction by 1.66% per 1 K temperature increase			
Relative humidity [%]	90 / condensation prohibited			
Installation height [m über NN]	bis 2000, ab 1000 m Leistungsreduzierung um 1% pro 100 m			
Storage and shipping temperature [°C]	-20 to +60			
Degree of soiling (in acc. with DIN EN 61800-5-1)	2			
Physical data				
Weight ZAdynpro [kg]	16.1	16.4	17.1	17.1
Dimensions h x w x d [mm]	517 x 311 x 190			

¹⁾ with a variable switching frequency (**power component/M_PWM=AUTO** menu), there is no reduction in power

9.2 EC/EU declaration of conformity

- Translation -
(english)

A-KON16_06-GB
2023/29 Index 007

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

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

Product description: Control devices ZAdyn/ZETADYN for elevator machines

Frequency inverters with a safe torque off (STO) function according to the Machinery directive 2006/42/EC, Annex IV, Nr. 21.

Type: ZAdyn4CA...
ZAdyn4CS...
ZETADYN 4CA...
ZETADYN 4CS...
ZAdynpro...
ZAdyn4BAplus...
ZAdyn4BSplus...

(The type details contain further additions concerning the version, e.g. ZAdyn4-CA 018 HY)

Series number: from
30284129/0001

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

Machinery directive 2006/42/EC

EMC Directive 2014/30/EU

Because of the accordance with the Machinery directive, the protection targets of the Low voltage directive 2014/35/EU are also fulfilled.

The following harmonized standards have been applied:

EN 61800-5-1:2007 +A1:2017 +A11:2021	Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy
EN 61800-5-2:2007	Adjustable speed electrical power drive systems - Part 5-2: Safety requirements - Functional
EN 61800-3:2004 + A1:2012	Adjustable speed electrical power drive systems - Part 3: EMC requirements and specific test methods
EN 12015:2014	Electromagnetic compatibility- Productfamily standard for lifts, escalators and moving walks - Emission
EN 12016:2013	Electromagnetic compatibility- Productfamily standard for lifts, escalators and moving walks - Immunity

The following additional standards have been applied:

EN 61800-5-2:2017	Adjustable speed electrical power drive systems - Part 5-2: Safety requirements - Functional
EN IEC 61800-3:2018	Adjustable speed electrical power drive systems - Part 3: EMC requirements and specific test methods

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. Mathias Spannagel(see above for address).

Künzelsau, 19.07.2023
 (Location, date of issue)

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

ZIEHL-ABEGG SE
 Mathias Spannagel
 Head of Department Technics Electronics
 Drive Technology
 (name, function)



(signature)



(signature)

9.3 Adjustment card

"Motor nameplate" menu

MOT_TYP	
n	
f	
p	
l	
U	
P	
TYP	
cos phi ¹⁾	
M_Max	

Encoder & BC menu

ENC_TYP	
ENC_INC	
BC_TYP	

Installation menu

V*	
MOD_n*	
n*	
__D	
__iS	
__i1	
__i2	
Q ¹⁾	
F ¹⁾	
G ¹⁾	

¹⁾ The parameter is only visible if
MOT_TYP=ASM is selected.

Control system menu

CONFIG	
MO_DR	
CTRL	
f_I01	
f_I02	
f_I03	
f_I04	
f_I05	
f_I06	
f_I07	
f_I08	
f_XBR1	
f_XBR2	
f_XBR3	
f_XBR4	
f_O1	
f_O2	
f_O3	
f_O4	
V_G1	
V_G2	
V_G3	
SIM_V1	
S_B_OFF	

Monitoring menu

MOD_ST	
STO	
CO	
BR	
LOCKBR	
UNLOCK	
P1P2	
T_ENC	
I_MAX	
T_I_MAX	
MASK1	
MASK2	
MASK3	
MASK4	
MASK5	

Start menu

M_START	
K_START	
T_0	
T_1	
T_2	
T_3	
V_T3	
BRK_DMP	

Acceleration menu

A_POS	
R_POS1	
R_POS2	

Travelling menu

V_1	
V_2	
V_3	
V_Z	
V_4	
V_5	
V_6	
V_7	

Deceleration menu

A_NEG	
R_NEG1	
R_NEG2	
S_DI3	
S_DI2	
S_DI1	
S_ABH	

Stop menu

T_4	
T_5	
T_5a	
T_5b	
T_6	

Controller menu

SPD_KP	
SPD_TI	

9.4 Part numbers

ZAdynpro with CANopen interface		ZAdynpro with DCP interface	
ZAdynpro 011	352250	ZAdynpro 011 DCP	352250-DCP
ZAdynpro 013	352251	ZAdynpro 013 DCP	352251-DCP
ZAdynpro 017	352252	ZAdynpro 017 DCP	352252-DCP
ZAdynpro 023	352253	ZAdynpro 023 DCP	352253-DCP
ZAdynpro 032	352254	ZAdynpro 032 DCP	352254-DCP
ZAdynpro 040	352255	ZAdynpro 040 DCP	352255-DCP
ZAdynpro 050	352256	ZAdynpro 050 DCP	352256-DCP
ZAdynpro 062	352257	ZAdynpro 062 DCP	352257-DCP
ZAdynpro 074	352258	ZAdynpro 074 DCP	352258-DCP

9.5 Certificates

Certificate





Functional Safety
www.tuv.com
ID 0600000000

Nr./No.: 968/A 166.07/22

Prüfgegenstand Product tested	Sicherheitsfunktion STO, Sicherer Halt (Stopp Kategorie 0) Safety Function STO, Safe Stop (Stop Category 0)	Zertifikats- inhaber Certificate holder	ZIEHL-ABEGG SE Heinz-Ziehl-Straße 74653 Künzelsau Germany
Typbezeichnung Type designation	ZETADYN 4 / ZAdyn4 / ZAdynpro Drive Family (für Einzelheiten siehe Revisions- Liste / for details see Revision List)		
Prüfgrundlagen Codes and standards	EN 81-20:2020 EN 81-50:2020 EN 61800-5-2:2017	EN 61800-5-2:2007 EN 81-1:1998 + A3:2009 EN 81-2:1998 + A3:2009	
Bestimmungsgemäße Verwendung Intended application	Sicheres Stillsetzen zur Anwendung in Personen- und Lastenaufzügen: Ersatz der Motorschütze zur Stillsetzung des Antriebes gemäß Safe stop for use at passenger lifts and goods passenger lifts: Replacement of contactors to stop the drive acc. to 5.9.2.5.4 d) or 5.9.3.4.2 d) of EN 81-20 or 12.7.3 a) of EN 81-1 or 12.4.1 a) of EN 81-2		
Besondere Bedingungen Specific requirements	Die Hinweise in der zugehörigen Installations- und Betriebsanleitung sowie dem Anhang zu diesem Zertifikat sind zu beachten. The instructions of the associated Installation and Operating Manual as well as the annex to this certificate shall be considered.		

Der Ausstellung dieses Zertifikates liegt eine Prüfung zugrunde, deren Ergebnisse im Bericht Nr. 968/A 166.07/22 vom
06.10.2022 dokumentiert sind.
Dieses Zertifikat ist nur gültig für Erzeugnisse, die mit dem Prüfgegenstand übereinstimmen.
The issue of this certificate is based upon an examination, whose results are documented in
Report No. 968/A 166.07/22 dated 2022-10-06.
This certificate is valid only for products which are identical with the product tested.

TÜV Rheinland Industrie Service GmbH

Bereich Automation
Funktionale Sicherheit
Am Grauen Stein, 51105 Köln

Certification Body Safety & Security for Automation & Grid



Dipl.-Ing. Thomas Steffens

Köln, 2022-10-13

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TÜV Rheinland Industrie Service GmbH, Am Grauen Stein, 51105 Köln / Germany
Tel.: +49 221 806-1790, Fax: +49 221 806-1539, E-Mail: industrie-service@de.tuv.com

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9 Enclosure

2023-02-06



Annex to Certificate 968/A 166.07/22

1. Component	Safety-Function STO (ZETADYN 4 / ZAdyn4 / ZAdynpro) implemented as safety circuit containing electronic components	
2. Manufacturer	ZIEHL-ABEGG SE Heinz-Ziehl-Straße 74853 Künzelsau	
3. Designation / Nomenclature	see Revision Release List	
4. Intended application	Safe stop of the lift drive (Safe Torque Off (STO))	
5. Function indication	Safety Function STO / Safe Stop (Stop-Category 0) within the ZETADYN 4 / ZAdyn4 / ZAdynpro product family	
6. Intended use	Use at passenger and goods passenger lifts: - Replacement of motor contactors for stopping the lift acc. to 5.9.2.5.4 d) und 5.9.3.4.2 d) of EN 81-20 or acc. to 12.7.3 a) of EN 81-1 or acc. to 12.4.1 a) of EN 81-2.	
7. Characteristics	Input voltage:	typ.: 0 / 24 V DC
	STO_A – GND and	LOW: 0 ... 3 V DC
	STO_B – GND	HIGH: 15 ... 30 V DC
	Input current:	typ.: 12 mA (HIGH)
	STO_A – GND and	
	STO_B – GND	
	turn-off time: (time between switching off the input signal(s) and disabling the power stage)	max. 50 ms (ZETADYN 4 / ZAdyn4C / ZAdynpro) max. 100 ms (ZAdyn4Bplus)
Discrepancy time t_v	Max. allowed discrepancy time between STO_A and STO_B: $t_v < 120$ ms	
Software diagnostic: (not safety relevant)	if $t_v > 120$ ms then failure indication by frequency converter	
Hardware diagnostic:	310 ms $< t_v < 1600$ ms (typ. 700 ms) (when exceeded, the drive is locked out and can only be set in operation again by power cycling).	
Minimum demand rate of the STO function:	1/h for min. 1600 ms each	
Working life:	After 20 years the device shall be replaced by a new one.	

2023-02-06



	<p>Protection degree of enclosure: IP 20 (ZETADYN 4 / ZAdyn4C / ZAdynpro) IP 10 (ZAdyn4Bplus) The user is required to ensure pollution degree 2 acc. to EN 61800-5-1 by suitable measures or choice of the mounting location.</p> <p>Operating temperature: ZETADYN 4 / ZAdyn4C / ZAdynpro: 0 ... +55 °C (above +40 °C reduction of rated power by 1,66 % per 1 K is required) ZAdyn4Bplus: 0 ... +55°C (above +40 °C at increased heatsink temperature automatic reduction of the clock frequency) < 90 % rH (no condensation))</p> <p>Humidity:</p> <p>Safety characteristics: SIL 3, ZETADYN 4 / ZAdyn4C / ZAdynpro: PFH = 3,11E-10 1/h MTTF_d = 410 a (High) DC_{avg} = High ZAdyn4Bplus PFH = 2,69E-10 1/h MTTF_d = 469 a (High) DC_{avg} = High</p>
<p>8. Maintenance</p>	<p>The frequency converter ZETADYN 4 / ZAdyn4 / ZAdynpro product family shall not be maintained by the end user. In case of failure, the device shall be replaced. The correct installation of the frequency converter and also the safety function STO needs to be checked regularly in accordance with the specifications stated in the manual.</p>
<p>9. Installation</p>	<p>The guidelines regarding installation, commissioning and operation shall be observed.</p> <ul style="list-style-type: none"> - The relevant national regulations (e.g. VDE-directions) and the requirements of the EN 81-20 resp. EN 81-1/-2 shall be followed and the wiring shall conform to general EMC requirements. - External short circuits and cross faults on the wiring and terminals of the STO-signals must be excluded because the internal diagnostic of the ZETADYN 4 / ZAdyn4 / ZAdynpro is not able to detect short circuits on the wiring. - Supply lines (power-, motor cable) and STO-cables shall be spatially separated. - The cable length for STO signals must not exceed 50 m.

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2023-02-06



<p>10. Configuration</p>	<ul style="list-style-type: none"> - The safety function STO is neither adjustable nor configurable. - Switching of the STO-signals shall be done by separate relays. (two channel operation). - It must be noted that the lift brakes are not operated by the STO function. Therefore the user shall ensure by appropriate electric circuits that the brakes are dropped when necessary.
<p>11. Auxiliary conditions for a safe operation</p>	<ul style="list-style-type: none"> - By selection of an appropriate mounting location it shall be ensured that environmental influences have no adverse effect on the safety circuit. In particular pollution degree 2 in accordance to EN 61800-5-1 shall be ensured by appropriate measures / mounting location. - In line with the commissioning and the periodical tests of the lift the following checks are required. <ul style="list-style-type: none"> - Check for correct Installation - Check for hardware version - Test of the Safety Function. - In case of a fault accumulation (defects of two or more power semiconductors), even at correct operation of the safety function STO, the motor shaft could turn for a maximum angle of $\varphi = (180^\circ / \text{number of pole pairs})$. Therefore the installation company shall ensure by risk analysis that this movement cannot cause any hazard. - A circuit breaker / fuse shall be installed in the power input of the frequency converter which disconnects the power in case of failures in the power stage. - It must be noted that up to 3 minutes after mains disconnection dangerous voltage is still present on the device (capacitor discharge time).



Declaration for trip direction change counter

Date of issue of original declaration : June 24, 2011
Revision number : 4
Revision date : 21-01-2022
Requirements : EN 81-20:2020
Project no. : P210323

1. General specifications

Name and address manufacturer : ZIEHL-ABEGG SE
Heinz-Ziehl-Strasse
74653 Künzelsau
Germany

Description of the reviewed component : Safe trip direction change counter

Frequency inverter type : Type series ZETADYN and ZAdyn

Data of examination : April 2011 - June 2011, May 2016, November 2016, January 2022

Examination done by : A. van den Burg

Laboratory : None

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Liftinstituut B.V.
Buikslotermeerplein 381
NL - 1025 XE Amsterdam

VAT number: NL.8103.99.441.B.01
Registered by the Dutch Chamber of Commerce
under number 34157363

+31 (0)20 435 06 06
contact@liftinstituut.com
www.liftinstituut.com



2. Description of the component

We herewith declare that the trip direction change counter fulfils all requirements for application with below mentioned certificates:

- NL10-400-1002-130-01 Brugg CTP 8,1 G2 coated suspension ropes for lifts.
- NL15-400-1002-130-02 Brugg CTP 6.5 G2 coated suspension ropes for lifts.
- NL12-400-1002-166-01 Contitech Polyrope 25-6x2,0 Lift suspension means.
- KP 195/2 Drako PTX 300 coated suspension ropes for lifts.

For applications with comparable conditions the counter can also be used with other lift suspension means.

This declaration is based on ZIEHL-ABEGG document "Sicherer Zähler für Seil Brugg SDR 8,1 mm" of June 21, 2011 as described below.

The counter is part of the ZIEHL-ABEGG type ZETADYN and ZAdyn frequency inverter.

It consists of two digital counters, the counter "A" (Parameter "TD_DRV") and the counter "B" (Parameter "TD_CNT"), both counters only count the number of changes in direction, successive trips in the same direction are counted as one trip only. Counter "A" is used to collect the total number of trips, it is not possible to reset this counter also not by a reset of the frequency inverter nor by removing its power supply. Counter "B" is used to limit the amount of allowed trips, changing of allowable maximum number of trips or resetting is protected by a password, this password can be defined for each controller separately.

Approximately one year before the allowed number of trips is reached, the display of the frequency inverter shows the number of trips that are left until the lift will be blocked (the ropes shall be changed before).

The estimation of the time that is left is based on the history of lift use and is updated after each trip.

When the maximum number of trips is reached, the inverter is setting the fault-output and an error message is shown in the display.

The inverter will not accept new trip commands until counter "B" has received a reset. To be able to exchange the ropes, after each restart of the inverter, one additional trip is possible.

Every reset of counter "B" is registered in memory in order to be able to check the history.



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When the frequency inverter is interchanged by a new one, the contents of counter “B” must be copied from the old inverter into the new one.

With best regards,

A. van den Burg
Product specialist Certification
Liftinstituut BV

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Liftinstituut B.V.
Buikslotermeerplein 381
NL - 1025 XE Amsterdam

VAT number: NL.8103.99.441.B.01
Registered by the Dutch Chamber of Commerce
under number 34157363

+31 (0)20 435 06 06
contact@liftinstituut.com
www.liftinstituut.com



TYPE EXAMINATION CERTIFICATE FOR LIFTCOMPONENTS

Issued by Liftinstituut B.V.

Certificate no. : NL12-400-1002-163-01 Revision no.: 6

Description of the product : Self-monitoring of the motor brake
- as part of protection against unintended car movement.
- as part of ascending car overspeed protection means.

Trademark : ZIEHL-ABEGG SE

Type no. : ZETADYN4, ZAdyn4, ZAdynpro

Name and address of the manufacturer : ZIEHL-ABEGG SE
Heinz-Ziehl-Strasse
74653 Künzelsau
Germany

Name and address of the certificate holder : ZIEHL-ABEGG SE
Heinz-Ziehl-Strasse
74653 Künzelsau
Germany

Certificate based on the following standard : EN 81-20:2020 clauses 5.6.6, 5.6.7 and 5.9.2.2.
EN 81-50:2020 clauses 5.7 and 5.8.

Test laboratory : None

Date and number of the laboratory report : None

Date of type examination : January 2023

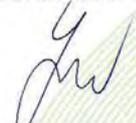
Additional document with this certificate : Report belonging to the type examination certificate
no.: NL12-400-1002-163-01 Rev.6

Additional remarks : This revision replaces certificate NL12-400-1002-163-01 Rev.5 of
11-11-2022

Conclusion : The product meets the standard referred to in this certificate
taking into account any additional remarks mentioned above.

Amsterdam
Date : 03-02-2023
Valid until : 11-11-2027

Certification decision by



W.G. Kasteleijn
Product Manager Certification

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Customer Service

phone +49 7940 16-308
fax +49 7940 16-249
drives-service@ziehl-abegg.com

Headquarters

ZIEHL-ABEGG SE
Heinz-Ziehl-Strasse · 74653 Künzelsau
Germany
phone +49 7940 16-0 · fax +49 7940 16-249
drives@ziehl-abegg.de www.ziehl-abegg.com

