Movement by Perfection



ZAdynpro

Frequency inverters

Issue 2025/37

Original operating instructions
Store for future use!

R-TBA24_02-GB 2025/37 Index 001 | 00163484-GB

ZIEHL-ABEGG

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1 Introduction

1.1 Liability

Compliance with the following specifications serves to ensure product safety. Should the information specified especially with regard to general safety, transport, storage, assembly, operating conditions, start-up, service, maintenance, cleaning and disposal/recycling not be observed, safe operation of the product may not be guaranteed posing a possible danger to life and limb of users and third parties. Thus, deviations from the specifications below can lead to the loss of legal materials defect liability as well as to the buyer's liability for the product rendered unsafe by deviation from the specifications.

1.2 Validity and meaning of the instructions

These instructions apply to frequency inverters in theZAdynpro model range from firmware 4.74.X and above

The model range can be identified by the type designation, see rating plate.

These instructions apply only to the product and not to the complete system.

The instructions provide guidelines for safe work.

▷ Store the instructions so that they are accessible to all persons who work with the product.
▷ Pass the instructions on to subsequent users.
▷ Read and follow the instructions in full.

1.3 Target group of the instructions

The target group of these instructions is transport personnel, qualified fitters who have been instructed in mechanical and electrical engineering, electricians, electrically instructed personnel, adjustment technicians, maintenance personnel, registered test engineers and planning engineers. This group is made up of people who can assess the assigned tasks, recognise possible dangers and take suitable safety measures on account of their specialist training, knowledge and experience as well as their knowledge of the relevant regulations.

1.4 Applicable documents

Observe the following documents for instructions:

- Order confirmation
- Technical information R-TIAxx_xx: Notices for elevator system planners or conversion notices for installation engineers.

  The latest versions of the R-TIA at: https://www.ziehl-abegg.com/bal

2 Safety instructions

2.1 Intended use

The product is intended for use in elevator systems and for mounting in a control cabinet.

The product is used to control the rotation speed of asynchronous motors and permanent magnet excited synchronous motors.

The operating instructions are part of the machine. The machine is only intended for use according to these operating instructions.

2.2 Requirements placed on the personnel

The client of the required measures in the product life cycle is responsible for ensuring that the personnel carrying out the work are sufficiently qualified.

Personnel	Minimum requirements, knowledge and experience
Planners and project designers	They are responsible for the project planning of the complete system. They have knowledge of applicable standards, legal requirements and safety regulations.
Transport personnel	They can deal safely with industrial trucks, loads and transport regulations. They can identify and avoid hazards that can occur when transporting the product. They have also been instructed and trained in the necessary protective equipment and protective measures to use.
Assembly personnel	They can deal safely with tools, loads and assembly instructions. They can identify and avoid hazards during assembly of the product. They have also been instructed and trained in the necessary protective equipment and protective measures to use.
Electrician	They have technical training in the field of electronics. They can identify and avoid hazards associated with electricity. They have also been instructed and trained in the necessary protective equipment and protective measures to use. They comply with technical rules and possess the following knowledge of electro-technology: ▫ Read and fully understand electronic connection diagrams. ▫ Understand all relationships regarding the safety devices. ▫ Are familiar with the function and design of the electrical components used.
Electrically trained personnel	Personnel instructed or supervised by a qualified electrician. They can identify and avoid hazards associated with electricity. They have been instructed in the assigned tasks and possible hazards in the event of improper conduct. They have also been instructed and trained in the necessary protective equipment and protective measures to use.
Start-up technician	They can confidently handle the entire system in which the product is installed. They can identify and avoid hazards that may occur during start-up. They have also been instructed and trained in the necessary protective equipment and protective measures to use.
Adjustment technician	They can confidently handle the entire system in which the product is installed. They can identify and avoid hazards that are necessary during the product's set-up process. They have also been instructed and trained in the necessary protective equipment and protective measures to use. They can identify and avoid hazards associated with electricity.
Maintenance personnel	They can confidently handle the entire system in which the product is installed. They can identify and avoid hazards that may occur during service and maintenance. They have also been instructed and trained in the necessary protective equipment and protective measures to use. They can identify and avoid hazards associated with electricity.
Registered test engineers	A person who possesses the knowledge needed to test elevator systems as a result of their professional training and experience.

2.3 Live parts

Touching live parts poses a risk of death due to electric shock.

▷ Do not touch connection points of wires, terminal points, parts of the motor winding, or the capacitor.
▷ Disconnect the product from the power supply before carrying out any work and secure it against being switched back on. Wait for at least 3 minutes.
▷ The safe isolation from the supply must be checked using a two-pole voltage detector.
▷ Check the product for damage; do not use the product if the insulation is defective.
▷ Only ever operate the product with the housing cover closed.

2.4 Modifications and spare parts

Unauthorised modifications and unauthorised spare parts can lead to serious injuries.

▷ Do NOT modify the product.
▷ Before making changes, obtain written approval from ZIEHL-ABEGG.
▷ Use spare parts from ZIEHL-ABEGG.

2.5 Impacts and shocks

Handle the product with care. Impacts and shocks will result in material damage.

▷ Transport the product in its original packaging.
▷ Do not step on the product.
▷ Do not expose the product to shocks or sudden mechanical loads.

2.6 Moisture and aggressive or conductive substances

Moisture and aggressive or conductive substances can cause material damage.

▷ Observe the ambient conditions under Technical data.
▷ Avoid moisture ingress.
▷ NO aggressive or conductive substances in the environment, e.g. solvents, metal dust.

2.7 Do not disassemble components

Dismantling components can cause material damage.

▷ DO NOT remove any components from the product other than electrical connection covers.

3 Transport and storage

Personnel qualifications: Transport personnel

3.1 Transport

⚠ WARNING **Crushing hazard due to suspended loads and uncontrolled moving parts.**

▷ Wear safety helmet, safety gloves and safety shoes.
▷ Only move loads under supervision.
▷ Do NOT walk or reach under suspended loads.
▷ Set down the load when you leave the work area.
▷ Secure the product during transport.
▷ Do not stack pallets.

ATTENTION **Material damage to components caused by transport.**

▷ Do NOT transport the product by the connecting cable.

Procedure:

1. Check the total weight and select the legally required lifting gears.
2. Transport the product in its original packaging.
3. Unpack the product.
4. Check the product for damage.
5. In the event of discrepancies, contact service, see service note on the back of the document.

6. Remove the packing material and dispose of it in accordance with local regulations.

3.2 Storage

ATTENTION **Material damage due to moisture, dirt and heat sources**

▷ Protect the product from external environmental influences.
▷ Store the product according to the ambient conditions specified in the technical data.

ATTENTION **Material damage due to excessively long storage duration.**

▷ Before applying full line voltage, reshape the capacitors: Connect the product for 1 hour at reduced voltage: 230 VAC to L1 and L2.

Maximum storage duration until reforming:

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

4 Product overview

4.1 ZAdynpro

The ZAdynpro is a frequency inverter for mounting in the control cabinet.

Size 011-032

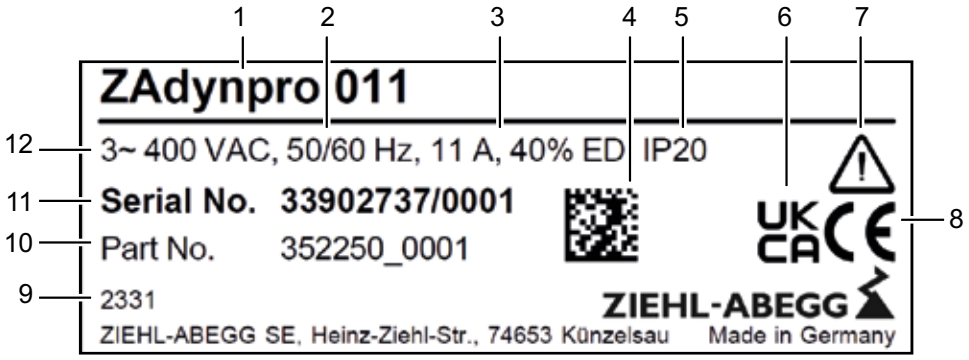


Size 040-074



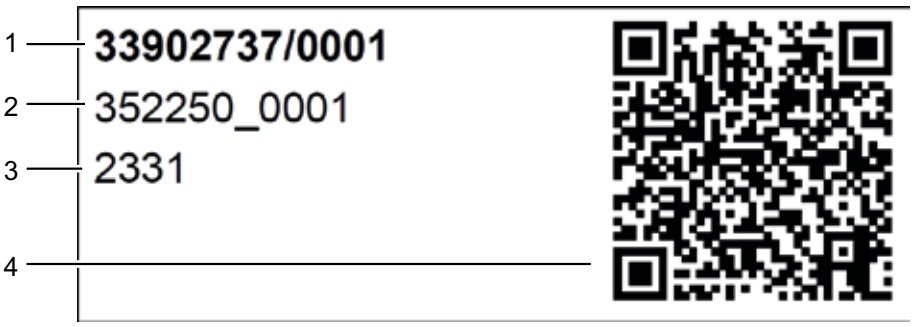
4.2 Rating plate and QR code

Example of rating plate:



1	*Type designation*	*7*	*Touch current in protective earth line exceeds an alternating current of 3.5 mA, or a direct current of 10 mA*
2	*Mains frequency*	*8*	*CE mark*
3	*Nominal current for 40% on time*	*9*	*Production date, year, calendar week*
4	*Internal DATA MATRIX code of ZIEHLABEGG SE*	*10*	*Part number*
5	*Degree of protection*	*11*	*Serial number*
6	*UKCA marking*	12	*Line connection voltage*

Example of QR code:



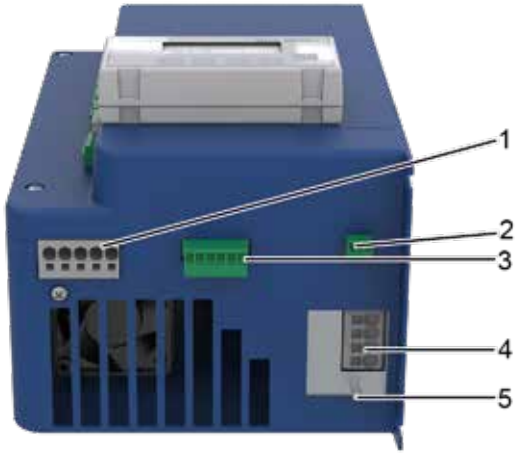
1	*Serial number*	*3*	*Production date, year, calendar week*
2	*Part number*	4	*QR code*

When the label's QR code is scanned with the ZAmon Mobile app, the latest version of the assembly instructions, the declaration of conformity, certificates and, if available, YouTube tutorials are displayed.

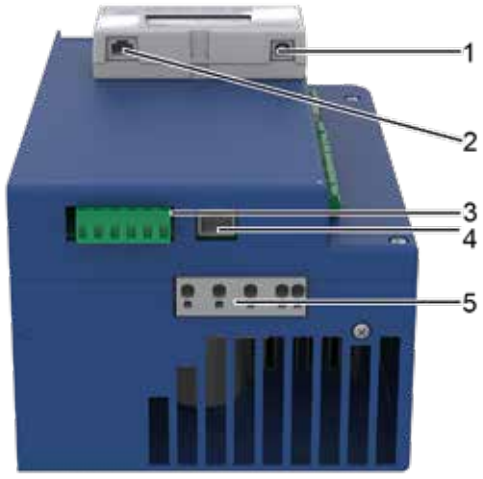
4.3 Interfaces size 011-032



1	*LED*	*Status LED*
2	*X-MMC*	*Memory card slot*
3	*X-OUT2*	*Digital outputs*
4	*X-IN*	*Digital inputs*
5	*X-BC*	*Temperature monitoring for brake resistor or brake chopper*
6	*X-BR*	*Function monitoring inputs for the motor brake*
7	*J4*	*CAN line terminating resistor*
8	*X-CAN*	*CAN or DCP*
9	*X-ENC 15*	*SUB-D rotary encoder*
10	*X-ENCO*	*Rotary encoder simulation*



1	*X3*	*Motor*
2	*X-SBY*	*Stand-by input*
3	*X-STO*	*Safe torque off*
4	*X1*	*Mains connection*
5	*M6*	*2nd protective conductor*

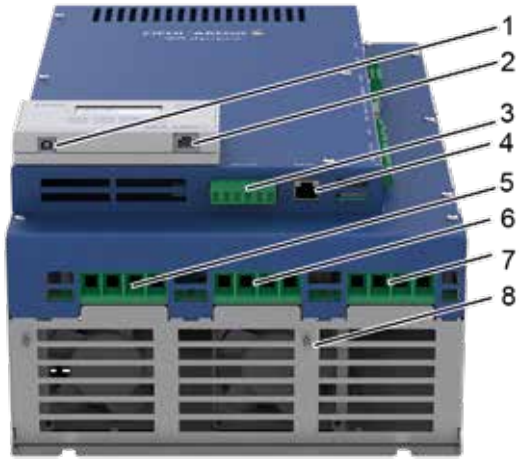


1	*USB type B*	*Connection to PC*
2	*RJ-45*	*Connection to (4)*
3	*X-OUT1*	*Digital outputs*
4	*X-PAD*	*Connection to (2)*
5	*X2*	*Brake resistor or brake chopper*

4.4 Interfaces size 040-074



1	*X-SBY*	*Stand-by input*
2	*X-STO*	*Safe torque off*
3	*X-ENCO*	*Rotary encoder simulation*
4	*X-ENC 15*	*SUB-D rotary encoder*
5	*X-CAN*	*CAN or DCP*
6	*J1*	*CAN line terminating resistor*
7	*X-BR*	*Brake function monitoring inputs*
8	*X-BC*	*Temperature monitoring for brake resistor or brake chopper*
9	*X-IN*	*Digital inputs*
10	*X-OUT2*	*Digital outputs*
11	*X-MMC*	*Memory card slot*
12	*LED*	*Status LED*



1	*USB type B*	*Connection to PC*
2	*RJ-45*	*Connection to (4)*
3	*X-OUT1*	*Digital outputs*
4	*X-PAD*	*Connection to (2)*
5	*X1*	*Mains*
6	*X2*	*Brake resistor or brake chopper*
7	*X3*	*Motor*
8	*M6*	*2nd protective conductor connection*

5 Function description

The frequency inverter provides a three-phase power system with variable frequency and variable voltage. The amount of voltage and frequency depends on the travelling speed and the load to be operated.

When using field oriented control, the motor is operated optimally at all operating points. Field oriented control enables precise adherence to the specified travel curve over the entire speed control range. As a result, every required torque level is provided almost immediately. The full nominal motor torque is already available at standstill, speed 0.

All speed curves are driven in a speed-controlled and load-independent manner.

The control can be used up to a speed of 6 m/s.

5.1 STO safety function

The STO safety function corresponds to the **Safe Torque Off stop function** according to EN 61800-5-2.

Activating the function ensures that no energy is fed to the motor through the frequency inverter, resulting in torque.

Contactors between the frequency inverter and the motor can 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 account by the person responsible for start-up in an application-specific risk analysis. The person responsible must observe the other applicable safety regulations and the standard-compliant definition of the requirements for components that control the STO function.

▷ Test the Safe Torque Off STO safety function during first-time start-up and with periodic tests, see *Testing the Safe-Torque-Off STO safety function, page 107* and *Service plan, page 152*.

Safety parameters

Safety function	Safe Torque Off according to EN 61800-5-2
Safety class	SIL 3 according to EN61800-5-2* Meets the requirements according to EN 81-20, section 5.9.2.5.4 d) and section 5.9.3.4.2 d*
Probability of dangerous failure per hour PFH	3.11E-10 1/h at maximum utilisation of the device over the entire service life
Mean time to dangerous failure of each channel MTTFd	410 years at maximum utilisation over the entire service life of the device
DC diagnostic coverage	high
Switch-off time: Duration from switching off of input signals to locking of output stage	< 50 ms
Minimum request rate for the STO function	1 time per hour at least 1600 ms
Life cycle	20 years, then the device must be replaced
Maximum allowed time delay between the signals STO_A and STO_B	Maximum 120 ms If this is exceeded, an error message is displayed, see *Notes regarding actuation, page 14*.

* Certification performed by TÜV Rheinland. If necessary, request copies from ZIEHL-ABEGG.

⚠ DANGER **Risk of death due to uncontrolled movement of the elevator cabin.**

No active braking occurs when the STO function is activated. The drive is running down.

▷ Install additional active braking, e.g. mechanical motor brake.

⚠ DANGER **Danger to life due to electric shock.**

The connected motor is not disconnected from the frequency inverter by activation of the STO function.

▷ When working on the wiring or the motor, disconnect the frequency inverter from the supply voltage and wait at least 3 minutes to discharge the intermediate circuit capacitors.

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

DANGER **Risk of death due to automatic restart.**

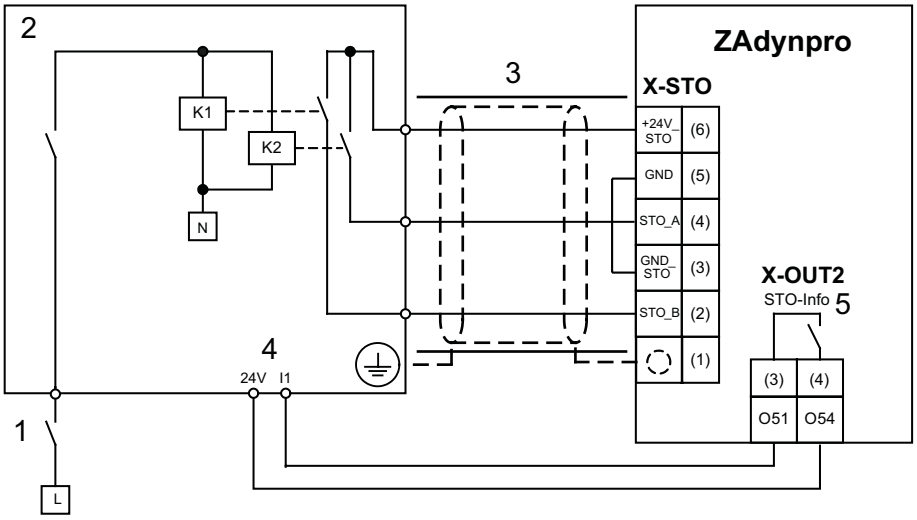
If a release isissued after the drive is locked by the STO function, the drive can restart automatically.

▷ If this is not allowed for the application, provide for additional external measures, e.g. restart only after confirmation.

Safety concept

- The frequency inverter has 2 safety-related inputs. The drive can 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. Switching off one of the two inputs causes the power output stage to be switched off.
- An internal diagnostic unit constantly compares the status of the 2 switch-off channels, STO_A and STO_B. If there is an error, the internal diagnostic unit triggers the shutdown of the drive, e.g. in the event of unequal actuation or an internal hardware defect.
- In the version shown on principle circuit diagram, monitoring of the two relays K1 and K2 by the elevator control is not necessary in order to meet the requirements of EN 81-20. Compliance with the requirements is ensured by the internal diagnostic unit.
- During each trip, the 2 inputs must be actuated simultaneously via 2 separate relays, whose control voltage is supplied from the end of the electrical safety chain, see principle circuit diagram.
- If the contacts are switched differently, this is detected at the STO inputs. After a maximum of 1600 ms, the internal diagnostic unit performs a safe shut-down. A reset is possible by switching the device off and on again.
- The status of the STO function can be queried with no relation to safety via the digital output configured with STO Info.

Simplified diagram



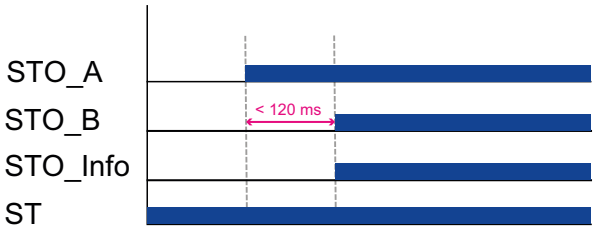
1	*Electrical safety chain*
2	*Controlling*
3	*Protected routing or version with 2 separate sheathed cables*
4	*Control digital inputs*
5	*Information only, not safety-related*

Notes regarding actuation

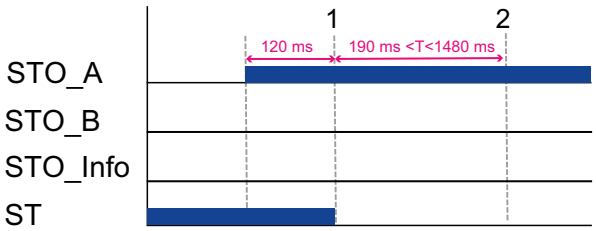
When switching the STO input signals STO_A and STO_B, a maximum period of 120 ms is tolerated between the signals. If exceeded, the ZAdynpro outputs error **533 STO: Failure** is triggered. The elevator control can interrupt travel. If the activation remains faulty, the internal diagnostic unit triggers a safe shut-down after a further 190 ms to a maximum of 1480 ms by emitting **error 960 STO: Diagnostics**.

An error detected by the internal diagnostic unit, e.g. due to unequal actuation or an internal hardware defect, leads to an error state with a locking effect. The error can be reset by switching the line voltage off and back on.

Correct STO actuation



Incorrect STO actuation



Input signals	
STO_A	Safety-related input STO_A
STO_B	Safety-related input STO_B
Output signals	
STO info	STO_A and STO_B inputs active - enable output stage
ST	Failure

1	Error **STO:Failure**
2	Error **STO: Diagnostic**

To ensure sufficient test coverage through diagnostics, observe the following times during operation:

▷ STO activation by switch-off of STO_A and STO_B at least once an hour for at least 1600 ms.

Correct actuation of the STO inputs is monitored additionally by the ZAdynpro during each trip, though not on safety grounds:

monitoring	**Error message**
If safe shut-down is not cancelled 2.5 s after the start of travel, i.e. the signals STO_A and STO_B remain LOW	348 STO: Remains
If safe shut-down is not performed 2.5 s after the end of travel, i.e. the signals STO_A and STO_B remain HIGH	532 STO: Missing
If safe shut-down is cancelled at a standstill, i.e. the signals STO_A, STO_B become HIGH and no travel signal is applied after 2.5 s	349 STO: Travel signal missing
If the STO input signals are switched off during travel, error message after 200 ms	531 STO: Interruption

Alignment torque for motors

⚠ WARNING **Risk of injury due to alignment movement of the motor despite activated STO function.**

In the event of a fault, a brief alignment torque is possible for permanently excited synchronous machines. If 2 or more power semiconductors are defective, the motor shaft can rotate by a maximum angle of φ = 360°/number of poles.

▷ Take movement into account for the system risk analysis.

Example with traction sheave diameter 200 mm, number of poles 14 and suspension 4:1, rounded up:

$$\frac{\text{driving disk diameter in mm}}{\text{number of poles x suspension}} \times 3{,}142 = \text{max. cabin movement in mm}$$

$$\frac{200\ \text{mm}}{14 \times 4} \times 3{,}142 = 12\ \text{mm}$$

Deactivate STO function

DANGER **Risk of death due to deactivated STO function.**

If the STO function is deactivated, there is no safe shut-down of the output stage.

▷ Implement safe shut-down in accordance with EN 81-20 by means of additional measures, e.g. motor contactors, see *Connecting the motor contactors, optional, page 29*.

6 Installation

Personnel qualifications: Assembly personnel

6.1 Assembling the product

ATTENTION **Material damage due to vibrations**

▷ Do not mount the product on vibrating components.
▷ Mount the product on a stable and vibration-free surface.

Procedure:

1. Position so the connection terminals X1 and X3 are pointing downwards.
2. Determine the installation position according to the size:
   Size 011-032: Vertical with the rear side pointing to the mounting surface or the side surface pointing to the mounting plate with additional fixing bracket.
   Minimum clearances to other parts: 100 mm at the top, 50 mm at the bottom.
   Size 040-074: Vertical with the rear side pointing to the mounting surface.
   Minimum clearances to other parts: 50 mm at the top, 100 mm at the bottom, 20 mm each to the right, left and front.
   For dimension sheets, see *ZAdynpro 011-032 dimension sheet, page 166* or *ZAdynpro 040-074 dimension sheet, page 167*
3. Secure the product with screws M5 and one standard washer each to the grounded mounting plate in the control cabinet without tension with a tightening torque of 3.0 Nm.
4. Check the inlet air and exhaust air for sufficient cooling in the control cabinet, taking into account the power loss of the ZAdynpro.
5. If ZAdynpro is operated with an operating terminal, secure this:
   Size 011-032: Insert the ZApadpro into the recess on the lid of the ZAdynpro and press it down.
   Size 040-074: Stick the enclosed magnetic strips into the 3 recesses on the back of the ZApad. Fix the ZApad on the housing of the ZAdynpro with the magnetic strips.

7 Electrical installation

Personnel qualifications: Qualified electrician or electrically instructed personnel

ATTENTION **Material damage due to electrostatic discharge.**

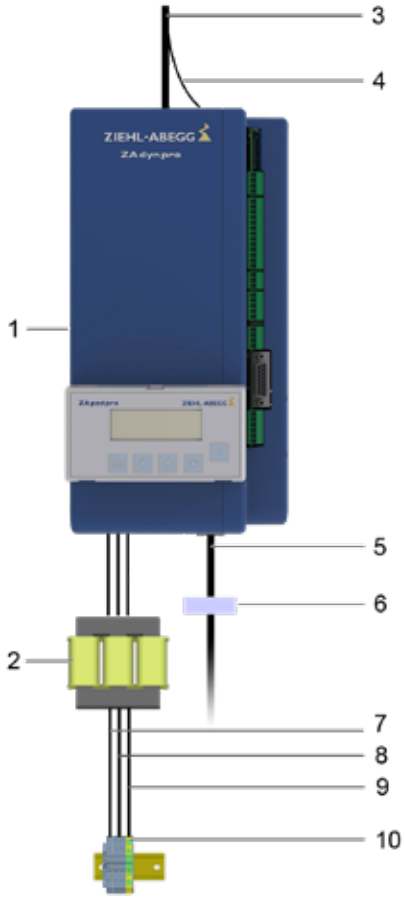
▷ Discharge yourself before working on electrical components, e.g. by touching grounded metallic parts.

7.1 Electromagnetic compatibility EMC

The product may only be operated within the scope of the EN 12015 and EN 12016 standards with correct use of a line reactor. Also outside the scope 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 according to EN 61800-5-2.

When correctly installed, the ZAdynpro corresponds to the following standards:

- EN12015:2014 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



1	*Mains connection terminal ZAdynpro*
2	*Line reactor*
3	*Brake resistor cable*
4	*Screening of brake resistor line*
5	*Motor cable*
6	*Clamp*
7	*Mains supply line*
8	*Mains connection terminal*

▷ Observe the maximum distance of 200 mm between ZAdynpro and the line reactor.

▷ Route the line reactor cable and the motor cable at the maximum distance.

▷ Route the cables (3), (5) and (7) separately from the control cables.

Requirements for cables and screening

▷ Also use shielded cables in the control cabinet.

Cable	Maximum length	Shielding	Shielding ZAdynpro
Mains	-	-	-
Motor	25 m	Earthed at both ends	Mounting plate clip

Cable	Maximum length	Shielding	Shielding ZAdynpro
Brake resistor	5 m	Earthed at both ends	Size 011-032: Pigtail on connection terminal Size 040-074: Pigtail on threaded bolt
Standby input	25 m	-	-
Digital inputs	25 m	-	-
Digital outputs	25 m	-	-
Rotary encoder	25 m	Earthed at both ends	Connector
Temperature monitoring of brake resistor	5 m	Earthed at the inverter end	Pigtail
STO	50 m	Earthed at both ends	Pigtail
ZApadpro	50 m	Earthed at both ends	-
Rotary encoder simulation	25 m	Earthed at the customer system end	-
CAN interface	Main line 200 m Stub line 1 m	-	
DCP interface	50 m	Earthed at the inverter end	Pigtail
Brake release monitoring	25 m	-	

▷ Observe the following chapters for connection.

7.2 Connecting the protective conductor

Procedure:

1. Selection of a suitable protective conductor according to EN 61800-5-1:

Cross-section Phase	Cross-section 1st protective conductor	Connection 1st protective conductor	2nd protective conductor required	Cross-section 2nd protective conductor	Connection 2nd protective conductor
< 16 mm²	At least phase conductor cross-section*	X1	Yes, if cross-section of 1st protective conductor < 10 mm²	Same as 1st protective conductor	Threaded bolt M6 underside ZAdynpro
16 mm² to 35 mm²	At least 16 mm²	X1	no	-	-

   * If the protective conductor is not part of the power supply cable or cable sheath:
   - with mechanical protection, e.g. cable duct: at least 2.5 mm²
   - without mechanical protection: min. 4.0 mm²
2. Connect the protective conductor:
   1st protective conductor to X1
   2nd protective conductor to threaded bolt M6 underside ZAdynpro

7.3 Connecting the mains connection

ATTENTION **Material damage due to incorrect mains connection.**

▷ Do not connect to IT networks.
▷ Compare the technical data on the name plate with the characteristics of the mains grid.

Procedure:

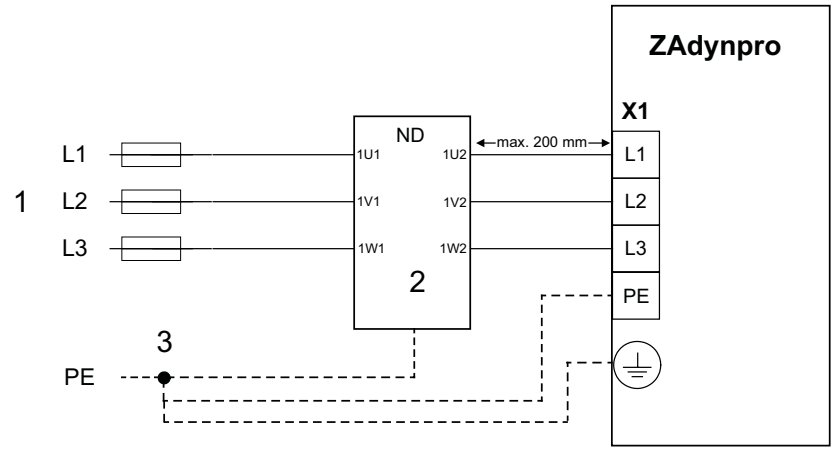
1. Determine the cable cross-section depending on the nominal motor current and ambient conditions.
2. Select an unshielded cable, flexible with wire end sleeves or rigid.
3. Select the mains fuse, taking into account the cable cross-section and ambient conditions.
   Use the following fuse as a maximum:

ZAdynpro size	Fuse for operating class gG
011	16 A
013	20 A
023	25 A
032	35 A
040	50 A
050	63 A
062	80 A
074	80 A

4. Install the mains fuse.
5. Select the appropriate line reactor:

ZAdynpro size	Line reactor	Article number
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

6. Install the ND line reactor (2) in the mains supply line and connect the product to the line (1):



7. Join the protective conductors at the central earthing point (3).

7.4 FI circuit breaker RCCB

No FI circuit breaker is required for operating the product. If a FI circuit breaker is nevertheless required, use an all-current sensitive FI circuit breaker type B with a tripping current of 300 mA for fire prevention according to guideline VdS 3501.

If equipotential bonding for the ZAdynpro and the motor has been carried out in accordance with the applicable standards VDE 0100-Part 540 and DIN EN 61880-5-1, no RCCB is required to meet the requirements of VDE 0100-410 for automatic switch-off in the event of a failure.

7.5 Connecting the brake resistor

ATTENTION **Risk of fire from overheating**

▷ Connect the brake resistor type BRxx to the terminals and +DC and R according to the wiring diagram.
▷ Connect the existing temperature monitoring devices.

ATTENTION **Malfunction due to EMC interference**

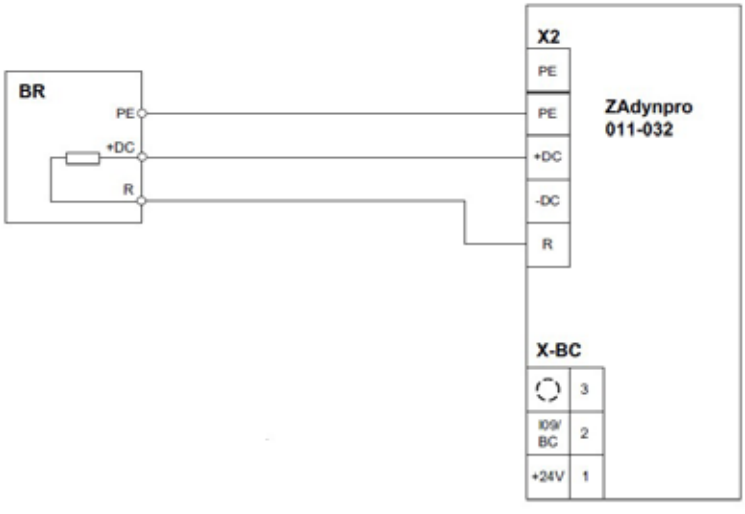
▷ Connect the cable shield with low impedance and so that it covers a large part of the cable.

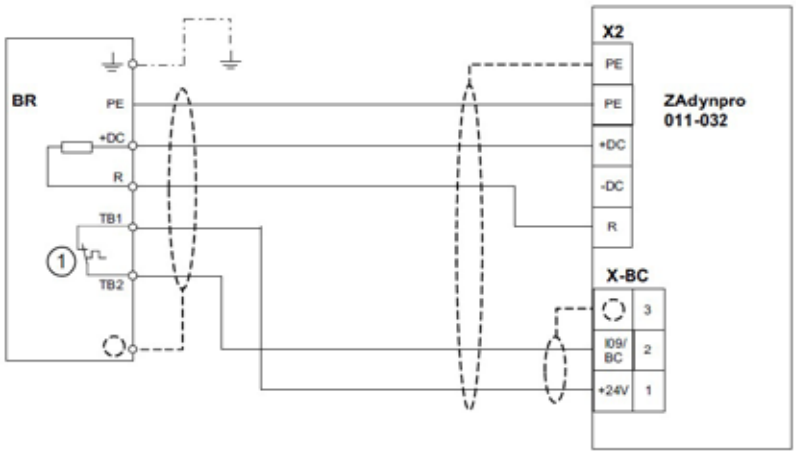
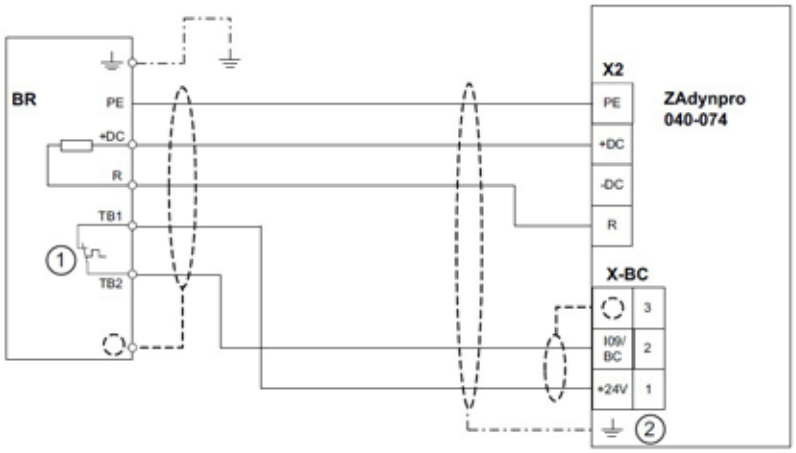
For cable requirements, see *Requirements for cables and screening, page 16*. Exception BR11-A: The pre-assembled cable can be extended to up to 5 m with a shielded, self-extinguishing cable.

Cable cross-section: max. 6 mm^2

Procedure:

1. Observe the instructions for the brake resistor.
2. Connect the brake resistor cable to the brake resistor according to the brake resistor and size:

Brake resistor	Size ZAdynpro	Connection
BR14-A without temperature monitoring and BR14-A	011-032	Wrap the two connected connection wires twice in the same winding direction around the supplied toroidal core:  

Brake resistor	Size ZAdyn-pro	Connection
BR17/ BR 25 / BR50 / BR100	011-032	Maximum contact rating: 5 A /250 VAC (1). Pigtail on connection terminal. 
	040-074	Maximum contact rating: 5 A /250 VAC (1). Threaded bolt (2) for protective conductor connection. 

3. Provide strain relief.
4. BR17 - BR 100: Connect the screening for the brake resistor cable to the brake resistor with a clip:
   ZAdynpro 011-032: Connect the pigtail screening for the brake resistor cable to the 2nd protective conductor terminal.
   ZAdynpro 040-074: Connect the pigtail screening for the brake resistor cable to the threaded bolt (2).
5. BR17 - BR 100: Connect the 2nd protective conductor to the threaded bolt of the brake resistor.

7.6 Connecting the motor cable X3

⚠ WARNING **Serious injury due to jerky movements or uncontrolled acceleration.**

▷ If the motor is operated with a rotary encoder, connect the supply line to the motor with the correct phases.

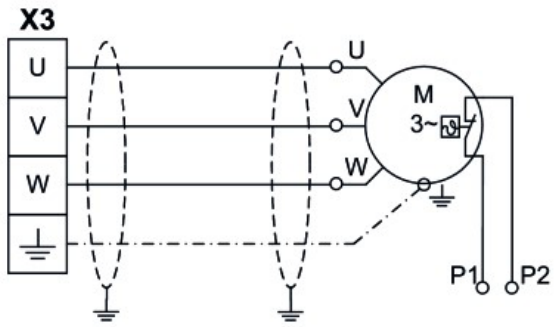
ATTENTION **Malfunction due to EMC interference.**

▷ Connect the cable shield with low impedance and so that it covers a large part of the cable.

For cable requirements, see *Requirements for cables and screening, page 16*. The nominal voltage U0/U of the line must be 450/750 VAC.

Procedure:

1. Select the cable cross-section depending on the motor current and ambient conditions.
2. Connect the cable to the motor with the correct phase:



3. Use a clip (1) to connect the motor cable screening fully to the grounded earthing plate in direct proximity to the ZAdynpro. Continue the screening right up to the connection terminal:

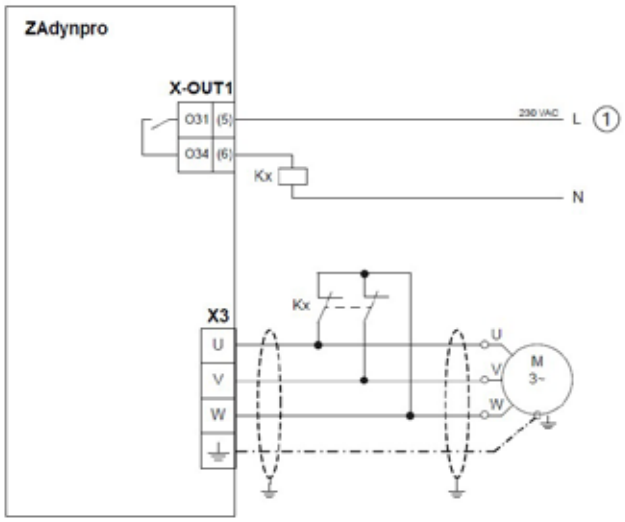


7.7 Short-circuiting the motor winding for synchronous motors

The short-circuit for manual emergency evacuation is possible with ZIEHL-ABEGG synchronous motors. A speed-dependent braking torque is generated by short-circuiting the motor winding. If synchronous motors from other manufacturers are used, make sure that manual emergency evacuation with short-circuited motor windings is allowed.

Procedure:

1. Connect the voltage supply to the contactor (1) independently of the safety chain.
   Example:



To activate the function, configure the corresponding digital output to **MotShortcir** in the **Control** menu. This output is activated when the motor is energised.

If the weight balance is checked when the brakes are opened, disable the short-circuit.

7.8 Monitoring the motor temperature

The ZAdynpro has no built-in electronic overtemperature protection. Monitoring must be performed by the higher-level elevator control.

7.9 Connecting digital inputs X-IN

The ZAdynpro has 8 configurable digital inputs. The digital inputs comply with the IEC61131-2 TYPE 2 industry standard.

Voltage range:	+22 to 26 VDC
Current consumption at 24 V:	10 mA -20%
Switching level:	low < 5 VDC high > 11 VDC
Line cross-section:	max. 1.5 mm²

For cable requirements, see *Requirements for cables and screening, page 16*.

Procedure:

1. Connect the cable:

Internal voltage supply

The 24 V voltage supply is for digital inputs only.

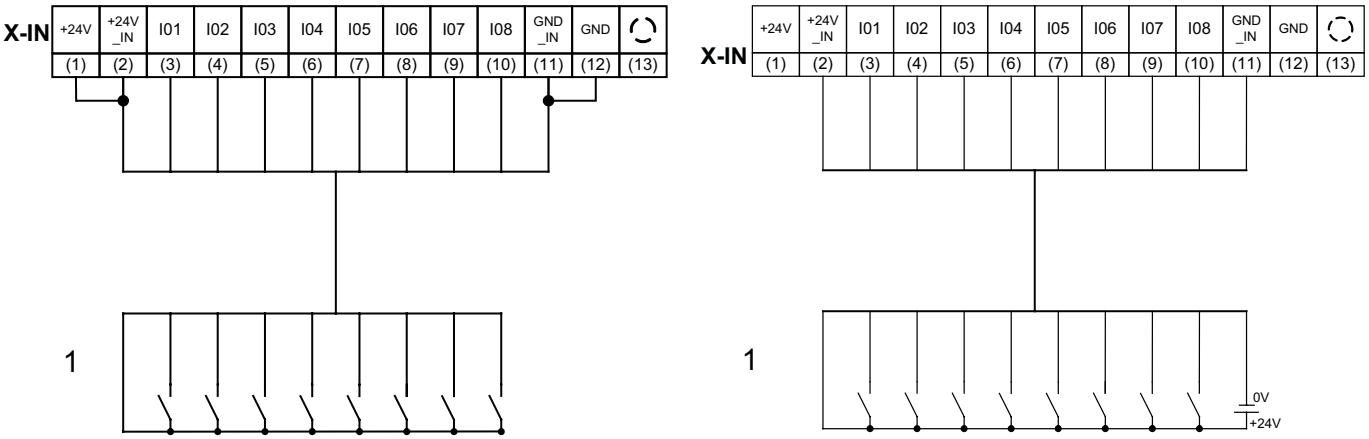
ATTENTION! Material damage due to incorrect connection

▷ DO NOT connect any external consumers.

The bridges between the terminals **+24 V / +24 V_IN** and **GND / GND_IN** are inserted at the factory.

External voltage supply

Remove the bridges between the terminals **24 V / +24 V_IN** and **GND / GND_IN**.



Functional assignment of the inputs, see *Functional assignment of inputs, page 44*.

Binary speeds, see *Binary speeds, page 45*.

7.10 Connecting digital outputs X-OUT1 and X-OUT2

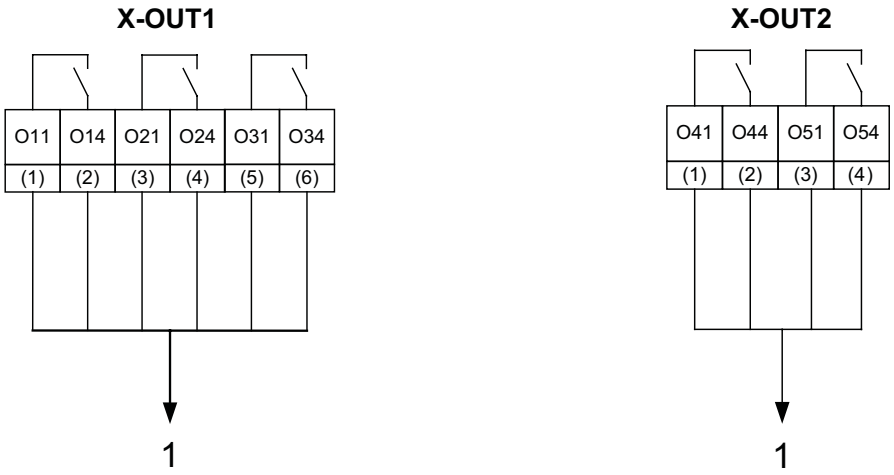
The ZAdynpro has 5 configurable digital outputs.

	X-OUT1	X-OUT2
Number of outputs	3	2
Minimum switching capacity	5 mA / 12 VDC	5 mA / 12 VDC
Maximum rating	2 A / 250 VAC	500 mA / 24 VDC
Line cross-section:	max. 2.5 mm^2	max. 1.5 mm^2

For cable requirements, see *Requirements for cables and screening, page 16*.

Procedure:

1. Connect the cables to the control (1):



2. If inductances are switched, connect them to an external protective circuit, e.g. free-running diode or RC element.

Functional assignment of the outputs, see *Function assignment of outputs, page 47*.

For a description of each configuration, see *5. Control, page 40*

7.11 Connecting the CAN or DCP interface X-CAN

Connection of serial communication via CANopen Lift or DCP protocol.

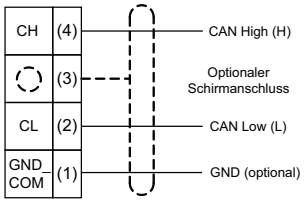
For cable requirements, see *Requirements for cables and screening, page 16*

Controller Area Network CANopen Lift

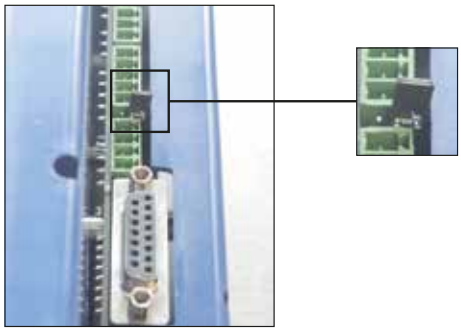
Procedure:

1. Connect the ZAdynpro to the CAN BUS. Carry out the wiring in a line structure. Connect the individual devices to the main line with short stub lines:

X-CAN



2. Terminate the main line at both ends with terminating resistors between 120 and 150 ohms.
3. If termination is carried out on the ZAdynpro, insert the jumper on the two right-hand pins depending on the size: Size 011-032 terminal J4, size 040-074 terminal J1.



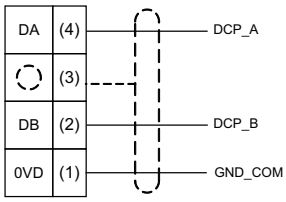
For more information, see *CANopen lift, page 80*

Drive control and position DCP

Procedure:

1. Connect the cable:

X-CAN



For more information, see *Drive control & position DCP, page 78*

7.12 Connecting the safe switch-off function X-STO

Voltage range:	0 to 30 VDC
Current consumption at 24 VDC:	12 mA per input
Switching level:	0 V < low < 3 VDC 15 V < high < 30 VDC
Connection type:	Screw terminals

Cable cross-section	0.25 mm² to 2.5 mm²

For cable requirements, see *Requirements for cables and screening, page 16*

Procedure:

1. Route the mains supply line, the motor cable and the cable to the brake resistor separately from the STO cables.
2. Select a relay. Use separate relays for each input for 2-channel control.

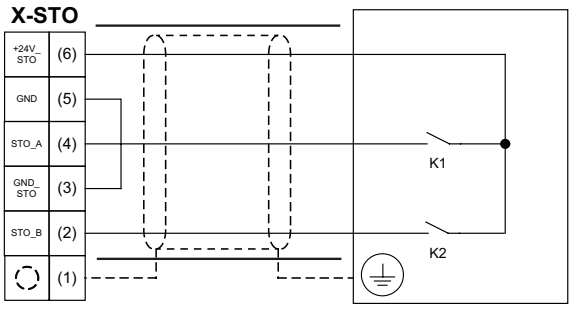
Rating	24 V and 12 mA, see technical data of STO inputs
Switching voltage	at least 60 VDC
Relay contacts	hard-gold-plated
Insulation	Safe separation between coil and contacts according to EN 60664-1 or equivalent standard.
Interference immunity	Ensure interference immunity to interference voltages on the control side of the coil, e.g. in the case of capacitive couplings in long control cables. If in doubt, use a relay with increased drop voltages, such as Phoenix Contact series PLC-…SO46, Finder series 38.51.3

DANGER! Risk of death due to failure of the STO function in the event of short circuits and external short circuits

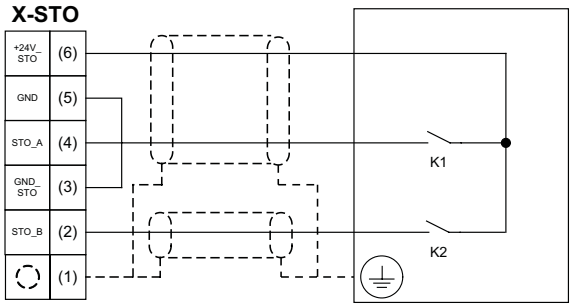
- ▷ Ensure a fixed installation of the STO line outside the control cabinet and protect it against external damage, e.g. with a cable duct or armoured tube. If separate sheathed cables are used for the STO_A and STO_B signals, the cables do not need to be protected for routing.
- ▷ Maintain a distance of at least 2 mm between the STO_A, STO_B and +24V_STO signals in accordance with EN 81-20/50, e.g. at terminal points.
- ▷ Prevent any external shorts in the relay exciter voltage.

3. Apply wiring technique in accordance with EN 60204-1 and use CENELEC or IEC-compliant connection terminals.
4. Connect the product according to the voltage and routing:

Internal 24 V voltage and protected routing



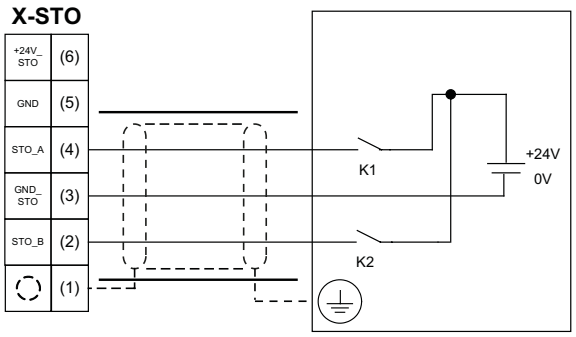
Internal 24 V voltage and use of two separate sheathed cables



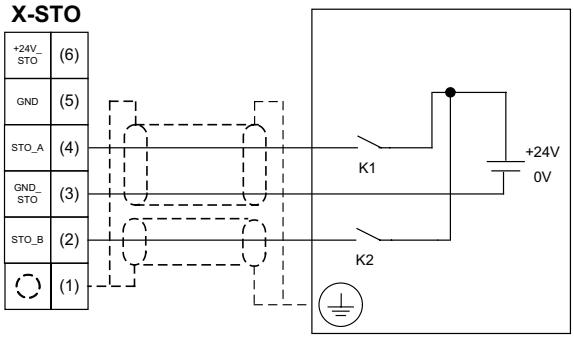
Danger! Risk of death due to failure of the STO function

- ▷ If an **external voltage source** is used to actuate the STO inputs, you must use a low voltage and safe electrical disconnection SELV or PELV.

External 24 V voltage and protected routing



External 24 V voltage and use of two separate sheathed cables



5. Apply screening on both sides. On ZAdynpro, connect the pigtail to the X-STO connection terminal.

Terminal assignment X-STO

No.	Name	Function
1	◌	Shielding
2	STO_B	Input STO_B
3	GND_STO	Reference potential, inputs STO_A and B
4	STO_A	Input STO_A
5	GND	Reference potential, 24 VDC output voltage
6	+24V_STO	24VDC output voltage for actuating the STO inputs, do not connect additional loads

For more information about the STO function, see *STO safety function, page 12*.

7.13 Connecting the rotary encoder for asynchronous motors X-ENC15

Rotary encoder:	Incremental counter TTL
Signal shape:	Right angle, Sin/Cos
Operating voltage:	5 VDC
Resolution:	64 to 11,000 pulses/revolution
Input resistance:	120 Ω
Frequency limit:	200 kHz
TTL_Differential signal to GND:	U low <= 0.5 V U high >= 2.5 V
Sine differential signal at 2.5 V offset to GND:	0.6 Vss ... 1.2 Vss
Connection:	D-Sub, 15-pin, in two rows

For cable requirements, see *Requirements for cables and screening, page 16*

Procedure:

1. Configure the rotary encoder type in the **Encoder & BC/ENC_TYPE** menu.
2. Configure the rotary encoder resolution in the **Encoder & BC/ENC_INC** menu.
3. Connect the rotary encoder.

Pin assignment

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

7.14 Connecting the rotary encoder for synchronous motors X-ENC15

Rotary encoder:	Absolute
Interfaces:	EnDat 01, SSI, SinCos, BiSS C or HIPERFACE
Resolution:	512 to 4096 pulses/revolution
Input resistance:	120 Ω
Frequency limit:	200 kHz
Sine differential signal at 2.5 V offset to GND:	0.6 Vss to 1.2 Vss
Connection:	D-Sub, 15-pin, in two rows

For cable requirements, see *Requirements for cables and screening, page 16*

Procedure:

1. Configure the rotary encoder type in the **Encoder & BC/ENC_TYPE** menu.
2. Configure the rotary encoder resolution in the **Encoder & BC/ENC_INC** menu.
3. Connect the rotary encoder.

Pin assignment of interface EnDat 01, SSI, SinCos and BiSS C

1	DATA	Data line	9	/CLK	Clock line inverse
2	/DATA	Data line inverse	10	CLK	Clock line for serial transfer
3	/D	Analog track D inverse	11	D	Analog track D for position transmission
4	+5 V_E	Voltage supply +5V	12	A	Analog track A
5	DGND	Earth	13	/A	Analog track B inverse
6	/C	Analog track C inverse for position transmission	14	/B	Analog track B inverse
7	B	Track B	15	DGND	Earth
8	C	Analog track C for position trans-mission	Housing		Shielding

Pin assignment for HIPERFACE interface

1	Data+	Data line	9	-	-
2	Data-	Data line inverse	10	-	-
3	-	-	11	-	-
4	U_s	Voltage supply +5/8V	12	+COS	Analog track B
5	-	-	13	REFCOS	Analog track B inverse
6	-	-	14	REFSIN	Analog track B inverse

7	+SIN	Analog track A	15	DGND	Earth
8	-	-	Housing		Shielding

7.15 Connecting the 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 RS422. The resolution corresponds to the rotary encoder resolution. If an external 24 V voltage source is connected to terminal +24V_EXT, the rotary encoder simulation is active even when ZAdynpro is switched off.

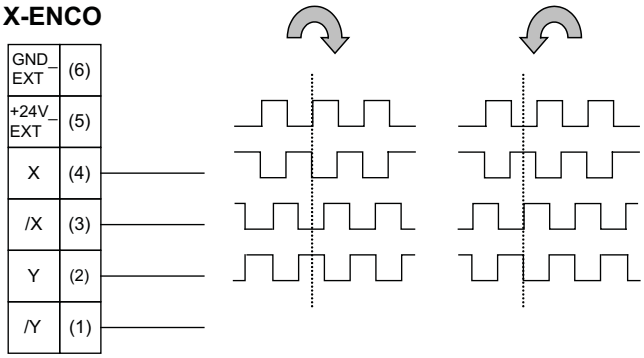
RLoad:	90 to 150 Ω, typically 120 Ω
Short-circuit-proof:	no
High output signal	min. 2.8 V / 8 mA
Low output signal	max. 0.4 V / 4 mA
Line cross-section:	max. 1.5 mm^2

For cable requirements, see *Requirements for cables and screening, page 16*

Procedure:

1. Connect the rotary encoder simulation according to the wiring diagram.
   Signal sequence depending on the direction of rotation when looking at the output side

X-ENCO



7.16 Connecting the external voltage supply X-ENCO

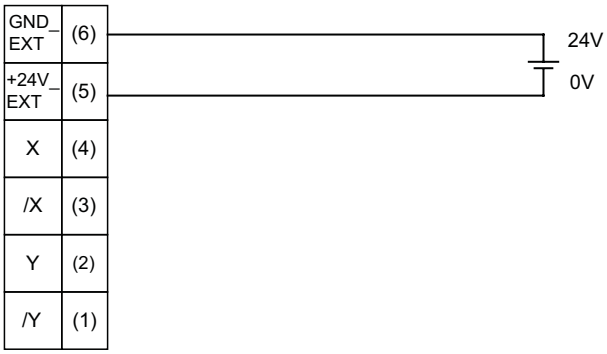
If an external 24 V voltage source is connected to terminal +24V_EXT, the rotary encoder simulation, the ZApad and the ZApad's USB port are active even when ZAdynpro is switched off.

Voltage range:	23 to 26 VDC
Current consumption at 24 V:	370 mA

Procedure:

1. Connect the external 24 V power supply:

X-ENCO



7.17 Connecting the standby input X-SBY

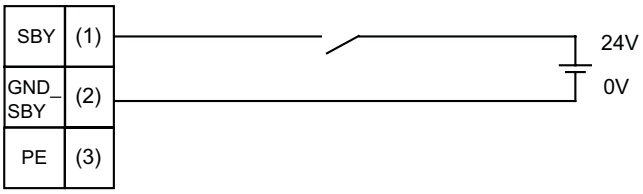
Voltage range:	+20 to 28 VDC
Low switching level:	<5 VDC
High switching level:	>15 VDC
Current consumption at 24 V:	8 mA
Line cross-section:	max. 1.5 mm²

For cable requirements, see *Requirements for cables and screening, page 16*

Procedure:

1. Connect the stand-by input.

X-SBY



For operation, see *Saving energy with the standby function, page 106*.

7.18 Connecting the motor contactors, optional

As an alternative to the STO function, motor contactors can be used to stop the drive.

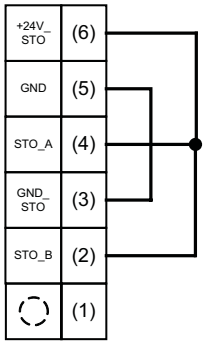
For cable requirements, see *Requirements for cables and screening, page 16*

- Cable length to the motor contactors < 200 mm: unshielded cable
- Cable length to the motor contactors > 200 mm: shielded cable

Procedure:

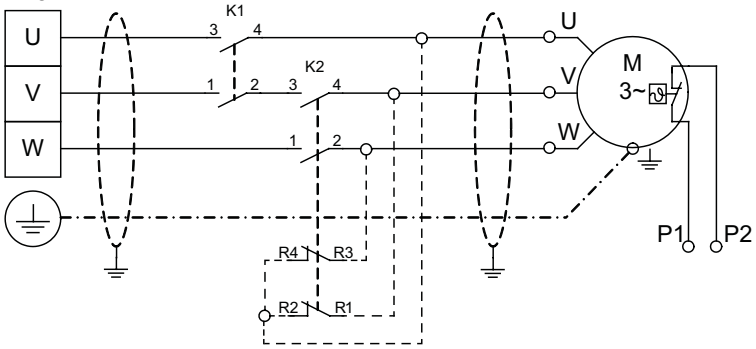
1. Connect the STO_A and STO_B inputs permanently to +24 V_STO:

X-STO



2. Disable the STO function monitoring in the **Monitoring/STO** menu.
3. Connect the motor contactors, carry out the optional short- circuit for synchronous motors via contacts R1 to R4, see *Short-circuiting the motor winding for synchronous motors, page 21*:

X3



Continue the screening between the motor contactors and X3 with the lowest possible HF impedance.

Feed the voltage supply of the motor contactors through the elevator control's line filter.

7.18.1 Connecting motor contactor monitoring X-BR

The switching states of the motor contactors must be monitored according to EN 81-20. The contactor monitoring by the ZAdynpro does NOT correspond to the monitoring of the motor contactors required in EN 81-20, as the opening of the individual motor contactors is not detected.

Monitoring voltage range:	+22 to 26 VDC
Current consumption at 24 V:	10 mA -20%
Low switching level:	<5 VDC
High switching level:	>11 VDC
Contact type:	Normally open contact (NO)
Line cross-section:	max. 1.5 mm^2

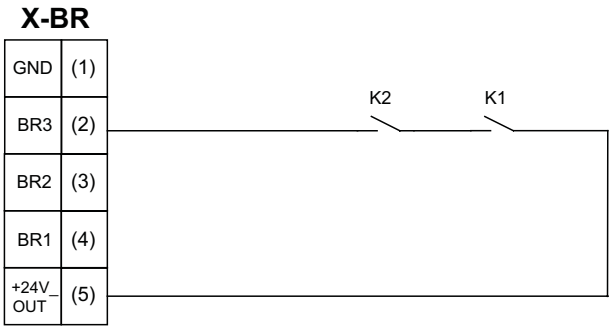
For cable requirements, *Requirements for cables and screening, page 16*.

ATTENTION **Malfunction possible due to overloading of the voltage supply**

▷ DO NOT connect additional consumers to the 24 V voltage supply

Procedure:

1. The contacts for monitoring the motor contactors are arranged in series.
2. Connect the temperature monitoring device:



3. Activate the contactor monitoring in the **Control/f_XBR3 = CO** menu.

7.19 Connecting the brake release monitoring X-BR

Brake release monitoring supports optimal starting and stopping of the drive.

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 car moving upwards against overspeeding and Chapter 5.6.7.3 as a protection device against unintended car movement.

Number of inputs:	3
Monitoring voltage:	+22 to 26 VDC
Current consumption at 24 V:	10 mA -20%
Contact type:	Normally open contact NO or normally closed contact NC
Line cross-section:	max. 1.5 mm^2

ATTENTION **Malfunction possible due to overloading of the voltage supply**

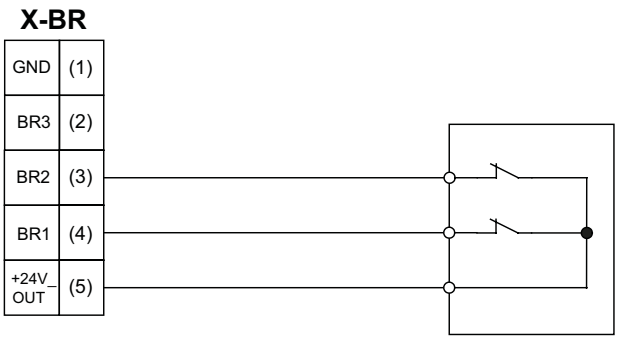
▷ DO NOT connect additional consumers to the 24 V voltage supply.

For cable requirements, see *Requirements for cables and screening, page 16*

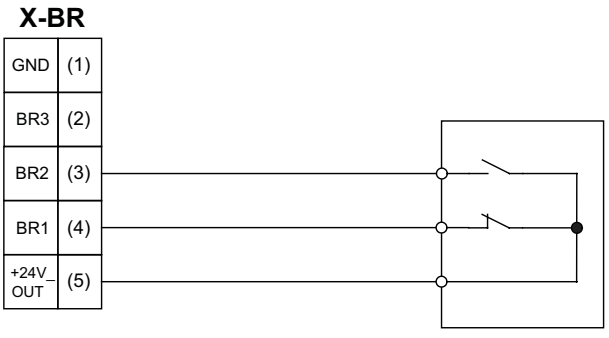
Procedure:

1. Activate brake release monitoring by selecting the number and function of brake monitoring contacts in the **Monitoring/BR** menu.
2. Activate the lock function in the **Monitoring** menu by selecting **LOCK_X=On**.
3. Connect the brake release monitoring:

a) with microswitches



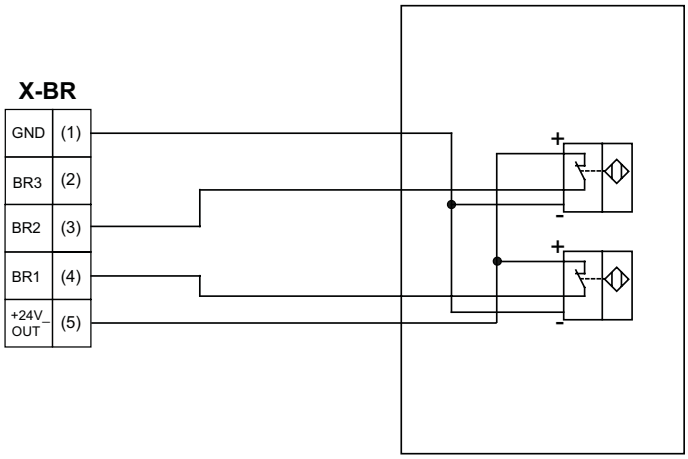
b) If **Monitoring/BR=1*NC+1*NO**



Function BR1: Input NC contact

Function BR2: NO contact input

c) with inductive proximity switches



For further information, see *Self-monitoring of brakes according to EN 81-20, page 106*

7.20 Connecting the ZApadpro or ZApad control element

Cable type:	CAT5 network line, 8-wire
Connection type:	both sides RJ-45 plug, 8-pole
Terminal ZAdynpro:	X-PAD Size 011-032 on top Size 040-074 on the bottom

For cable requirements, see *Requirements for cables and screening, page 16*

Procedure:

1. Connect the operating terminal and connect it to the ZAdynpro.

8 Operation

8.1 Operating the ZAdynpro

The ZAdynpro can be operated and parametrised with:

- The ZApadpro or ZApad operating terminal
- The ZAmon Mobile app in combination with the optional ZAmon STICK Bluetooth adapter
- Elevator control
  If the ZAdynpro is remotely operated via the display of the elevator control during communication via CANopen Lift or DCP, operation via ZApadpro is deactivated. To activate operation via the ZApad, push the Enter key for 3 seconds.

8.2 ZApad or ZApadpro display and control element

ZApad and ZApadpro are operating modules that are independent of ZAdynpro.



esc	Escape	▫ Back ▫ **NO** for YES-NO questions ▫ Abort
↵	Enter	▫ Confirmation ▫ **YES** for YES-NO questions
↑	Arrow up	▫ Menu selection ▫ Selection of parameters ▫ Increase parameter values
↓	Arrow down	▫ Menu selection ▫ Selection of parameters ▫ Decrease parameter values
i	i	▫ Display or exit the INFO menu ▫ Current operating states

Explanation of the symbols on the display

Motor-Typenschild → Encoder & BC Anlage-daten Steuerung	→	Menu selection
Motor-Typenschild n 128 rpm ↳ f 18.0 Hz I 40.4 A	↳	Adjustable parameter
Anfahren T2_real 0.0 s >> T_3 0.1 s V_T3 0 mm/s	>>	2nd parameter set
Anlage-Daten MOD_n* Mit D..i2 └ n* 94 rpm __D 0.240 m	└	Modifiable parameter: ▫ Currently locked by password or ▫ depending on another parameter or ▫ active travel
Start T_2 1.0 s └ T2_real 0.8 s T_3 0.1 s	└	Informative display of a value or function
Serial-No---------- 01 ZAdynpro 013 SN:06128238/0001 3.17-1037	i Zahl	Info menu page number
MMC-Recorder □ REC_MOD On REC_CFG 0 REC_NUM 0	□	The recorder records a measurement on the memory card.
Start ERR T_2 1.0 s └ T2_real 0.8 s T_3 0.1 s	ERR	Failure, see *Troubleshooting, page 125*

Enter numerical values

- Continuously change the parameter value with the up or down arrow keys.
  Brief press on the key: current value +1 or -1
  Long press on the key: current value changes until the key is released
- Modify individual digits:
  Use the i key to select the digit and use the up or down arrow keys to modify the digit.

8.3 ZAmon Mobile app

In combination with the ZAmon stick, ZAmon mobile is the optimal tool for operating ZAdyn frequency inverters via Bluetooth with a smartphone or tablet. The app has a clearly structured user interface, texts for each parameter and an online help function.

Google Play

App Store

9 Parametrisation

Parametrisation is only possible when the drive is stationary.

Personnel qualifications: Adjustment technician

9.1 Menu structure

Depending on the user level, different menus and parameters are shown on the display.

Basic specifies the basic settings for direct start-up in the **Start-up** menu. Under **Advanced**, more detailed settings and adaptations can be specified. The level that is active upon start-up can be configured in the **LCD & Password/ USR_LEV** menu. You can switch between the basic level and advanced level section by pressing and holding the ESC key.

The menu structure may vary slightly depending on the ZAdyn frequency inverter used.

Overview of the Advanced level menu

1. LCD & password, page 35

2. Motor name plate, page 36

3. Rotary encoder & BC, page 37

4. System data, page 38

5. Control, page 40

Digital inputs parameter description, page 42

Functional assignment of inputs, page 44

Binary speeds, page 45

Parameter description of the digital outputs, page 45

Function assignment of outputs, page 47

6. Monitoring, page 48

7. Starting, page 50

8. Accelerating, page 51

9. Travelling, page 51

10. Decelerating, page 52

11. Stopping, page 52

12. Control , page 53

13. Parameter set 2, page 53

14. Statistics, page 54

15. Memory card, page 55

16. MMC recorder, page 56

17. Encoder calibration for synchronous motors, page 58

18. Safety catch, page 58

19. HW ident., page 59

20. Power unit, page 59

21. Tests, page 59

22. ZA Intern, page 60

23. INFO menu, page 60

1. LCD & password

Parameter	Description of the parameters	Value range	Ex works	Basic
LONG	Operating language	**German** **English** **Türkce** **Nederland** **Espanol** **Italiano** **Svenska** **Cesky** **Francais** **Polski** **Russki**	German	x
USR_LEV	User level	**Advanced** **Basic**	Basic	x
PASSWD	Password input	0 ... 9999	0	
PW_NEW	New password 0 = no password	0 ... 9999	0	

Parameter	Description of the parameters	Value range	Ex works	Basic
PWCODE	Encoded password Contact service hotline in the event of loss.	-	21689	

2. Motor name plate

Parameter	Description of the parameters	Value range	Ex works	Basic
MOT_TYP	Motor type	**ASM**: Asynchronous motor Synchronous motors: **SMxxx**: Third-party product **SM132.xx-14**: ZIEHL-ABEGG type SM132 **SM160.xx-20**: ZIEHL-ABEGG type SM160 **SM180.xx-14**: ZIEHL-ABEGG type SM180 **SM190.xx-20:** ZIEHL-ABEGG type SM190 **SM200.xx-20:** ZIEHL-ABEGG type SM200 **SM210.xx-20:** ZIEHL-ABEGG type SM210 **SM225.xx-20**: ZIEHL-ABEGG type SM225 **SM250.xx-20**: ZIEHL-ABEGG type SM250 **SM315.xx-30:** ZIEHL-ABEGG type SM315 **SM500.xx-24:** ZIEHL-ABEGG type SM500 **SM700.xx-30**: ZIEHL-ABEGG type SM700 **SM860.xx-30**: ZIEHL-ABEGG type SM860 **SL506.xx-30**: ZIEHL-ABEGG type SL506 **SL510.xx-28:** ZIEHL-ABEGG type SL510 **BD132.xx-14:** ZIEHL-ABEGG type BD132	SM225.xx-20	x

Parameter	Description of the parameters	Value range	Ex works	Basic
n	Nominal speed	0.1 ... 6000 rpm	depending on motor type	x
f	Rated frequency	0.1 ... 200 Hz		x
p	Number of pole pairs, motor			
I	Nominal current	0.1 ... 200 A		x
U	Nominal voltage	0.1 ... 460 V		x
P	Nominal power	0.1 ... 90 kW		x
cos phi	Power factor of asynchronous motor	0.10 ... 1.0		x
Type	Circuit type	**Star** **Delta**	Star	x
M_MAX	Maximum motor torque	0.2 ... 5.0	2.0	
ASM_ID	Identification of asynchronous motor	**Off** **Meas. only** **On** **Continuous** **Save**	Off	x
TRACK	Temperature-dependent tracking of the motor parameters	**Off** **Slow** **Fast**, use after consultation with ZIEHL-ABEGG.	Off	x

3. Rotary encoder & BC

Parameter	Description of the parameters	Value range	Ex works	Basic
ENC_Type	Rotary encoder type	Synchronous motors: **EnDat/SSI:** Absolute encoder. Transmission of position information via SSI or EnDat protocol **ERN1387**: Absolute encoder transmission of position information via analog signal **Hiperface**: Absolute encoder **BiSS-C**: Absolute encoder with BiSS-C interface Asynchronous motors: **TTL Sine**: 5 V encoder sine signal **TTL Square**: 5 V encoder square-wave signal **HTL 10-30V**: 10-30 V encoder square-wave signal **No ENC**: Open loop operation	EnDat/SSI	x

Parameter	Description of the parameters	Value range	Ex works	Basic
ENC_INC	Encoder resolution pulses/ revolution	64 ... 11000	2048	x
BC_TYP	Brake resistor type	**BR11**: Type BR11-A **BR50**: Type BR50 **BR50+BR25**: Parallel circuit BR25 and BR50 **BR50+BR50**: Parallel circuit of 2x BR50 **BRxx**: Third-party product **PFU**: Power Feedback Unit = Power recuperation unit **PFU+BR11**: PFU and TYPE BR11 **PFU+BR17**: PFU and TYPE BR17 **PFU+BR25**: PFU and TYPE BR25 **PFU+BR50**: PFU and TYPE BR50 **BR09-1**: TYPE BR09-1 **BR14**: Type BR14 **BR100**: Type BR100 **PFU+BRxx**: Power recuperation unit and third-party product **2*BR100**: Parallel circuit of 2x BR100 **3*BR100**: Parallel circuit of 3x BR100 **4*BR100**: Parallel circuit of 4x BR100 **BR17**: Type BR17 **BR25**: Type BR25 **BC25**: Brake chopper type BC25 **BC50**: Brake chopper type BC50 **BC100**: Brake chopper type BC100 **ZArec**: ZArec power feedback unit	BR17	x
R_BR	Resistor for BC_ TYPE=BRxx: Third-party product	4 ... 200 ohm	64 ohm	
P_BR	Rated power with BC_ TYPE=BRxx: Third-party product	0.0 … 65 kW	0.5 kW	
T_PFU	Time from end of travel to activation of PFU output 0 = Function deactivated	0 ... 600 s	0 s	

4. System data

Parameter	Description of the parameters	Value range	Ex works	Basic
V*	System nominal speed	0.00 ... 10.00 m/s	0 m/s	x

Parameter	Description of the parameters	Value range	Ex works	Basic
MOD_n*	Input type, system nominal speed n*	**direct**: manual input **Calculate**: Speed n* is calculated by entering V*; __D; __iS; __i1 and __i2	Calculate	
n*	Motor speed at V* **MOD_n = direct**: manual entry **MOD_n = Calculate**: Speed calculated as a function of V*; __D; __iS; __i1 and __i2	0.1 ... 6000 rpm	Asynchronous motors: 1358.1 rpm Synchronous motors: 60.6 rpm	x
_D	Traction sheave diameter	0.06 ... 1.50 m	Asynchronous motors: 0.45 m Synchronous motors: 0.315 m	x
_iS	Suspension of the system	**1:1** | **2:1** | **3:1** **4:1** | **5:1** | **6:1** **7:1** | **8:1**	1:1	x
_i1	**i1** of the gearbox ratio i1:i2	1 ... 650	1	x
_i2	**i2** of the gearbox ratio i1:i2 for asynchronous motors	1 ... 1000	32	x
Q	Elevator system nominal load	100 ... 32,000 kg	600 kg	x
F	Car weight	100 ... 32,000 kg	1000 kg	
G	Counterweight	0 ... 32,000 kg	1300 kg	

5. Control

Parameter	Description of the parameters	Value range	Ex works	Basic
CONFIG	Configuration of digital inputs and outputs	**00:Free**: Outputs are freely configurable **01:ZA_IO**: ZIEHL-ABEGG standard **02:ZA_CAN**: ZIEHL-ABEGG CAN **03:BP_IO**: Böhnke+Partner standard **04-07:BP_DCP1-4**: Böhnke & Partner DCP1-4 **08:KN_IO**: Kollmorgen standard **09-10:KN_DCP3-4**: Kollmorgen DCP3-4 **11:NL_IO**: New Lift standard **12:NL_DCP3**: New Lift DCP3 **13:SS_IO**: Schneider Steuerungstechnik standard **14:SS_DCP3**: Schneider Steuerungstechnik DCP3 **15:ZA_BIN**: ZIEHL-ABEGG standard with binary speed specification **16:WL_IO**: Weber Lifttechnik standard **17-20:WL_DCP1-4**: Weber Lifttechnik DCP1-4	01:ZA_IO	x
CONFIG	Configuration of digital inputs and outputs	**21:ST_IO**: Strack Lift Automation standard **22-23:ST_DCP3-4**: Strack Lift Automation DCP3-4 **24:CSILVA**: Carlos Silva standard **25:X-BIN**: Free binary assignment **26:KW_DCP3**: KW Aufzugstechnik DCP3 **27: MAS_BIN**: Masora standard **28: BU_SATU**: Hydraulic elevator with Bucher power pack type Saturn ALPHA **29: BU_ORIO**: Hydraulic elevator with Bucher power pack type Orion ALPHA **30: KS_IO**: Georg Kühn Steuerungstechnik standard **31: KL_IO**: Kleemann standard **32: S_SMART**: Schindler Smart standard **33: SS_DCP4**: Schneider Steuerungstechnik DCP4 **34: OS_DCP3**: Osma DCP3 **35: Lester:** Lester Controls **36: HY-Mod:** Operation of hydraulic systems **37:NL_DCP4**: New Lift DCP4 **38:DAC:** Digital Advanced Control CAN	01:ZA_IO	x
MO_DR	Motor rotation direction RV1=UP	**Left** **Right**	Left	x

Parameter	Description of the parameters	Value range	Ex works	Basic
CTRL	Communication between the frequency inverter and control when **CONFIG = 00:Free**	**Standard**: Parallel wiring **DCP1** to **DCP4**: Communication via DCP0X protocol **CAN**: CANopen-Lift protocol	Standard	
X_BIN_1	Allocation of travelling speeds to binary codes when **CONFIG = X_BIN**	**00:Free | 04:V1| 05:V2** **06:V3 | 07:VZ | 08:V4** **09:V5 |10:V6 | 11:V7** **17:v=0**	00:Free	
X_BIN_2				
X_BIN_3				
X_BIN_4				
X_BIN_5				
X_BIN_6				
X_BIN_7				
f_I01	Digital inputs I01 to I08 when **CONFIG = 00:Free** Input I08 freely adjustable regardless of CONFIG.	**00:Free | 01:RF | 02:RV1-UP** **03:RV2_AB | 04:V1 | 05:V2** **06:V3 | 07:VZ | 08:V4** **09:V5 | 10:V6 | 11:V7** **12:PARA2 | 13:BIN0 | 14:BIN1** **15:BIN2 | 16:DIR (1=UP) | 17:v=0** **18:RF+RV1 | 19:RF+RV2 | 20:BR1** **21:BR2 | 22:BR3 | 23:BR4** **24:XBIN0 | 25:XBIN1 | 26:XBIN2** **27:MBIN0 | 28:MBIN1 | 29:MBIN2** **30: STANDBY2 | 31: STEP+ | 32:STEP-** **33:PFU_BR | 34:HY_UP | 35:HY_DOWN** **36:/DELAY | 37:DTE | 38:RECORD** **39:INV_A1 | 40: FKT.ana | 41:Monitor** **43: STANDBY1 | 44:ZR_RDY 4** **45:/ESC | 46:SBC_RDY | 47:CO** **48: EVA act | 49: MOT_TEMP | 50: RF+V1** **51:MD_BM_Fb**	01:RF	
f_I02			04:V1	
f_I03			05:V2	
f_I04			06:V3	
f_I05			06:V3	
f_I06			02:RV1-UP	
f_I07			03:RV2-DOWN	
f_I08			00:Free	
f_XBR1	Brake monitoring, inputs BR1 to BR4		20:BR1	
f_XBR2			21:BR2	
f_XBR3			22:BR3	
f_XBR4 not with ZAdynpro			00:Free	
f_O1	Digital outputs O1 and O5 when **CONFIG = 00:Free**	**Off | PFU | RB** **Rope info |/RB | TD_CNText** **V<V_G1 | Full load | V<V_G2** **SD | V<1.1*V_3 | STOInfo** **Prewarning | /STO Info | Fault** **BR Info | Evac.Dir. | ZR_EN** **MB Brake | Stutter br. |/V<V_G1** **MotShortcir |/V<V_G2 | EvaDisMains** **V=0 | P<0 | VentCtrl | ZAdyn ready**	Failure	
f_O2			MB brake	
f_O3			RB contactor	
f_O4			V<V_G1	
f_O5			STO info	
V_G1	Limit value 1 at V<V_G1 for digital input	0.03 ... 3.20 m/s	0.30 m/s	

Parameter	Description of the parameters	Value range	Ex works	Basic
V_G2	Limit value 2 at V<V_G2 for digital input	0.03 ... 3.20 m/s	0.50 m/s	
V_G3	Limit value 3, DCP only	0.03 ... 3.20 m/s	0.80 m/s	
LOD_IN	Input signal for load weighing unit	**Off** **DCP**: Transfer of load information via DCP protocol from the elevator control **CAN**: CANopen-Lift protocol	Off	
LOD_CF	Load compensation factor	0% .. 180%	0%	
LOD_CD	Load compensation direction	**Normal** **/Inverse**	Normal	
LIFT_NO	Lift number	1 ... 2	1	
NODE_ID	Node number Standard Control: 1 ZAdyn: 2 Shaft position sensor: 4	1 ... 128	2	
BD_RATE	Transmission rate	10 kBd… 250 kBd	250 kBd	
T_CMD	Maximum waiting time for commands from the control	200… 3000 ms	1500 ms	
SIM_V1	V1 simulation	**SIM_V1** must be activated to carry out a distance-dependent deceleration from V3 -> V1 or V2 -> V1 with binary speed specification. **ON**: Distance-dependent deceleration activated **Off**: Distance-dependent deceleration deactivated	Off ON when Config = 15: ZA_BIN 24: CSILVA 25: X_BIN 27:MAS_BIN	
A_MAX	Deceleration at emergency stop: Deactivation of the input with the / DELAY function	0.2 ... 2.55 m/s²	1.00 m/s²	
S_B_OFF	Brake distance offset	50 … 160 mm	50 mm	

Digital inputs parameter description

Parameter	Description of the parameters
00:Free	No function
01:RF	Controller enable. The input must be activated during the entire journey.
02:RV1	Direction of travel: Up

Parameter	Description of the parameters
03:RV2	Direction of travel: Down
04:V1	Speed for positioning the cabin at the stop
05:V2	Intermediate speed for normal travel operation, optional
06:V3	High travelling speed for normal travel operation
07:VZ	Speed for readjustment, priority over other speeds
08:V4	Intermediate speed
09:V5	Intermediate speed
10:V6	Intermediate speed
11:V7	Intermediate speed
12:PARA	Switch to 2nd parameter set
13:BIN0	Speed specification by binary coding, binary input 0
14:BIN1	Speed specification by binary coding, binary input 1
15:BIN2	Speed specification by binary coding, binary input 2
16:DIR	Direction of travel specification: 1-signal UP, 0-signal DOWN
17:v=0	When the motor brake is open, the speed is controlled to 0.
18:RF+RV1	Controller enable and direction of travel UP are actuated with one input.
19:RF+RV2	Controller enable and travel direction DOWN are actuated with one input.
20:BR1	Brake monitoring 1 at input terminal X-IN
21:BR2	Brake monitoring 2 at input terminal X-IN
22:BR3	Brake monitoring 3 at input terminal X-IN
23:BR4	Brake monitoring 4 at input terminal X-IN
24:XBIN0	Speed specification at binary input 0, free binary assignment
25:XBIN1	Speed specification at binary input 1, free binary assignment
26:XBIN2	Speed specification at binary input 2, free binary assignment
27:MBIN0	Speed specification at binary input 0, Masora configuration
28:MBIN1	Speed specification at binary input 1, Masora configuration
29:MBIN2	Speed specification at binary input 2, Masora configuration
30:STANDBY2	Energy saving by switching the ZAdyn to the function stand-by 2
31:STEP+	Inch mode for special application: Positive change
32:STEP+	Inch mode for special application: Negative change
33:PFU_BR	Monitoring of brake resistor function when used with power recuperation unit
34:HY_UP	ZAdyn HY: for a hydraulic elevator with Bucher power pack type Saturn ALPHA or Orion ALPHA, direction specification UP. The input functions RF and RV1 and V1 are activated simultaneously upon activation.
35:HY_DOWN	ZAdyn HY: for a hydraulic elevator with Bucher power pack type Saturn ALPHA or Orion ALPHA, direction specification DOWN. The input functions RF and RV1 and V1 are activated simultaneously upon activation.
36:/FastStp	Deceleration at emergency stop: When the input is deactivated, the motor is decelerated with the deceleration rate set in the **Control/A_MAX** menu.
37:DTE	Test function for ZIEHL-ABEGG
38:RECORD	Starting and stopping of measurements by external signal Input activated: Measurement active; input deactivated: Stop measurement and save
39:INV_A1	For hydraulic elevators with Bucher power pack type Orion ALPHA: Direction specification UP, inversion of the analogue setpoint
40:FKT.ana	Test function for ZIEHL-ABEGG
41:Monitor	For manual evacuation: Display of evacuation direction and evacuation speed

Parameter	Description of the parameters
42:LZ	Distance-dependent deceleration to a standstill, even with activated travelling speed. Deceleration dependent on travelling speed V1 and programmed distance S_10, see Technical Information sheet R-TIA14_08.
43:STANDBY1	Stand-by mode to save energy
44:ZR_RDY	ZArec monitoring function
45: /ESC	Deactivate electronic short-circuit
46:SBC_RDY	ZAsbc4C monitoring function
47:CO	Function not assigned
48:EVAact.	When switching to battery power supply during travel: Input must be activated
49:MOT_TEMP	For external motor monitoring: Ability to display overtemperature
50: RF+V1	Controller enable and speed for positioning the cabin at the stop
52:RESET	Firmware reset

Functional assignment of inputs

Configuration	Inputs							
	IO1	IO2	IO3	IO4	IO5	IO6	IO7	IO8
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
02:ZA_CAN	Free	Free	Free	Free	Free	Free	Free	Free
03:BP_IO	RF	V1	V2	V3	VZ	RV1-Up	RV2-Down	Free
04:BP_DCP1	Free	Free	Free	Free	Free	Free	Free	PARA2
05:BP_DCP2	Free	Free	Free	Free	Free	Free	Free	PARA2
06:BP_DCP3	Free	Free	Free	Free	Free	Free	Free	PARA2
07:BP_DCP4	Free	Free	Free	Free	Free	Free	Free	PARA2
08:KN_IO	RF	V1	V2	V3	VZ	RV1-Up	RV2-Down	Free
09:KN_DCP3	Free	Free	Free	Free	Free	Free	Free	PARA2
10:KN_DCP4	Free	Free	Free	Free	Free	Free	Free	PARA2
11:NL_IO	RF	V1	V2	V3	VZ	RV1-Up	RV2-Down	Free
12:NL_DCP3	Free	Free	Free	Free	Free	Free	Free	PARA2
13:SS_IO	RF	V1	V2	V3	VZ	RV1-Up	RV2-Down	V4
14:SS_DCP3	Free	Free	Free	Free	Free	Free	Free	PARA2
15:ZA_BIN	RF	DIR	BIN0	BIN1	BIN2	Free	Free	Free
16:WL_IO	RF	V1	V2	V3	VZ	RV1-Up	RV2-Down	V4
17:WL_DCP1	Free	Free	Free	Free	Free	Free	Free	PARA2
18:WL_DCP2	Free	Free	Free	Free	Free	Free	Free	PARA2
19:WL_DCP3	Free	Free	Free	Free	Free	Free	Free	PARA2
20:WL_DCP4	Free	Free	Free	Free	Free	Free	Free	PARA2
21:ST_IO	RF	V1	V2	V3	VZ	RV1-Up	RV2-Down	Free
22:ST_DCP3	Free	Free	Free	Free	Free	Free	Free	PARA2
23:ST_DCP4	Free	Free	Free	Free	Free	Free	Free	PARA2
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
26:KW_DCP	Free	Free	Free	Free	Free	Free	Free	PARA2
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

Configuration	Inputs							
	IO1	IO2	IO3	IO4	IO5	IO6	IO7	IO8
32:S_SMART	RF	V1	LZ	V3	V4	RV1-Up	RV2-Down	Free
33:SS_DCP4	Free	Free	Free	Free	Free	Free	Free	PARA2
34:OS_DCP3	Free	Free	Free	Free	Free	Free	Free	Free
35:Lester	Free	Free	Free	Free	Free	Free	Free	Free
36:HY-Mod.	Free	Free	Free	Free	Free	Free	Free	Free
37:NL_DCP4	Free	Free	Free	Free	Free	Free	Free	PARA2
38:DAC	Free	Free	Free	Free	Free	Free	Free	PARA2

Binary speeds

Fixed binary allocation CONFIG=15:ZA_BIN			
Travelling speed	Input function		
	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 speed	Input function		
	XBIN2	XBIN1	XBIN0
-	0	0	0
Control/X_BIN1	0	0	1
Control/X_BIN2	0	1	0
Control/X_BIN3	0	1	1
Control/X_BIN4	1	0	0
Control/X_BIN5	1	0	1
Control/X_BIN6	1	1	0
Control/X_BIN7	1	1	1

The binary codes can be freely assigned with travelling speeds via the parameters **Control/X_BIN1 to X_BIN7**.

Parameter description of the digital outputs

Parameter	Description of the parameters
Off	Output open. No function.
RB	Controller ready: Contact closes when the following signals are present: Controller enable, travelling speed and direction enable. The inputs of the STO function must be activated or the motor contactors connected at the same time as RB.
/RB	Inverted function of *RB* Contact opens when the following signals are present: Controller enable, travelling speed and direction enable. The inputs of the STO function must be activated or the motor contactors connected at the same time as /RB.
V<V_G1	Speed monitoring: If the V_G1 speed set in the Control menu is exceeded, the contact opens.
V<V_G2	Speed monitoring: If the V_G2 speed set in the Control menu is exceeded, the contact opens.
V<1.1*V_G3	Speed monitoring: If the travelling speed V3 is exceeded by 10%, the contact opens.
Pre-warning	With ZAdyn4: Monitoring of motor temperature and power unit temperature If there is a fault warning due to the temperature being too high, the contact opens. The current travel operation is completed. The pre-warning can be evaluated by the control system and a new start-up prevented.

Parameter	Description of the parameters
Failure	Failure: If there no error in the ZAdyn, the contact is closed.
Evac.Dir.	Evacuation direction Contact open: Cabin lighter than counterweight Contact closed: Cabin heavier than counterweight
MB	Mechanical brake Contact closes as soon as sufficient torque is built up to open the mechanical brake without jerking the cabin. The mechanical brake must open without delay.
/V<V_G1	Inverted function of *V<V_G1* If the limit value Control/V_G1 is exceeded, the contact closes.
/V<V_G2	Inverted function of *V<V_G2* If the limit value Control/V_G2 is exceeded, the contact closes.
V=0	Speed = 0 Actual speed at start of travel > 0 m/s: Contact opens Actual speed at end of travel = 0 m/s and RB-contactor output = 0: the contact closes
PFU	Stand-by mode to save the power recuperation unit's energy
Suspension means	Suspension means replacement Current suspension means can still be used for approx. 1 year. Contact closes until the suspension means has been replaced and the down counter is reset.
TD_CNT ext.	When the direction of travel is changed, the output relay emits a pulse at the respective output. Suitable for connection of an external counter, e.g. in the control system.
Full load	Full load If the nominal motor current is exceeded for 200 ms during constant travel, the contact closes.
SD	Speed monitoring Closed loop operation: If the actual speed < limit value V_G1 during deceleration V3, the output becomes active Open loop operation: If the setpoint speed < limit value V_G1 during deceleration V3, the output becomes active Actual/setpoint speed = 0: Output inactive
STO info	Status of the STO function. Information only, not safety-related. If the output stage is not locked by the STO function, the contact is closed.
/STO info	Inverted function of *STO info*. Information only, not safety-related. If the output stage is locked by the STO function, the contact is closed.
BR Info	Status of brake monitoring inputs BR1 to BR4 If the brakes are open during travel, the contact is closed.
ZR_EN	ZArec: Enable of ZArec4C power feedback unit If signals for controller enable, travelling speed and direction specification are present, the contact closes.
Stutter br.	Stutter brake Elevator cabin speed > V_G1, contact opens Elevator cabin speed < V_G1, contact closes
MotShortcir	Signal for using an external contactor to short-circuit the motor, see *Short-circuiting the motor winding for synchronous motors, page 21*
EvaDisMains	Output signal for disconnecting the line for emergency evacuation via battery. As soon as the system is at a standstill, the ZAdyn restarts and waits for the line voltage to be restored.

Parameter	Description of the parameters
P<0	The output is activated as soon as the ZAdyn is in generator mode and has stopped consuming power from the line.
Fan Ctrl	Internal function
ZAdyn ready	When the frequency inverter is ready to accept a travel command, the output is activated.

Function assignment of outputs

Configuration	Outputs				
	O11-O14	O21-O24	O31-O34	O41-O44	O51-O54
00:Free	Failure	MB	RB	V < V_G1	STO info
01:ZA_IO	Failure	MB	RB	V < V_G1	STO info
02:ZA_CAN	Failure	MB	RB	V < V_G1	STO info
03:BP_IO	Failure	MB	RB	V < V_G1	STO info
04:BP_DCP1	Failure	MB	RB	V < V_G2	STO info
05:BP_DCP2	Failure	MB	RB	V < V_G2	STO info
06:BP_DCP3	Failure	MB	RB	V < V_G2	STO info
07:BP_DCP4	Failure	MB	RB	V < V_G2	STO info
08:KN_IO	Failure	MB	RB	V < V_G1	STO info
09:KN_DCP3	Failure	MB	RB	V < V_G1	STO info
10:KN_DCP4	Failure	MB	RB	V < V_G1	STO info
11:NL_IO	Failure	MB	RB	V < V_G1	STO info
12:NL_DCP3	Failure	MB	RB	V < V_G1	STO info
13:SS_IO	Failure	MB	RB	V < V_G1	STO info
14:SS_DCP3	Failure	MB	RB	V < V_G1	STO info
15:ZA_BIN	Failure	MB	RB	V < V_G1	STO info
16:WL_IO	Failure	MB	RB	V < V_G1	STO info
17:WL_DCP1	Failure	MB	RB	V < V_G1	STO info
18:WL_DCP2	Failure	MB	RB	V < V_G1	STO info
19:WL_DCP3	Failure	MB	RB	V < V_G1	STO info
20:WL_DCP4	Failure	MB	RB	V < V_G1	STO info
21:ST_IO	Failure	MB	RB	V < V_G1	STO info
22:ST_DCP3	Failure	MB	RB	V < V_G1	STO info
23:ST_DCP4	Failure	MB	RB	V < V_G1	STO info
24:CSILVA	Failure	MB	RB	V < V_G1	STO info
25:X_BIN	RB	MB	V=0	Failure	STO info
26:KW_DCP3	Off	MB	RB	Off	STO info
27:MAS_BIN	Failure	MB	RB	Off*	STO info
30:KS_IO	Failure	MB	RB	V < V_G1	STO info
31:KL_IO	Failure	MB	RB	Evac.Dir.	STO info
32:S_SMART	Failure	MB	RB	SD	STO info
33:SS_DCP4	Failure	MB	RB	V < V_G1	STO info
34:OS_DCP3	V < V_G1	Off	RB	Off	STO info
35:Lester	Failure	MB	RB	V < V_G1	STO info
36:HY-Mod.	Failure	MB	RB	V < V_G1	STO info
37:NL_DCP4	Failure	MB	RB	V < V_G1	STO info
38:DAC	Failure	STO info	MB	Off	Off

6. Monitoring

Parameter	Description of the parameters	Value range	Ex works	Basic
MOD_ST	Behaviour of the frequency inverter in the event of failure	**Locking function** in the event of consecutive serious errors. The output ST-fault remains open. The fault counter is set to 0 after error-free travel. **Fix 2 Sec.**: no blocking function, the output configured at “ST” drops for 2 seconds in the event of an error **Lock n.1** to **n.3**: Locking function after 1, 2 or 3 errors. Output “ST” remains dropped after the 1st, 2nd or 3rd error. Message: ZAdyn lock! To unlock, press OK. The device goes into normal operation after the i key is pushed.	Fix 2 s	
STO	STO monitoring Only deactivate if motor contactors are used instead of the STO function.	**ON** **OFF**	ON	
LOCK_X	Lock in the event of brake malfunction and overspeeding Vz	**ON**: The ZAdyn is locked in the event of brake malfunctions. When **CONFIG = 31:KL_IO**, LOCK_X is automatically activated **OFF**	OFF	
UNLOCK	Unlock in the event of brake malfunction.	**ON**: Lock is released in the event of brake malfunction. **OFF**	OFF	
CO	Motor contactor monitoring not with ZAdynpro	**OFF** **CO1**: via input CO1, series connection of monitoring contacts **CO1&CO2**: contactor monitoring is implemented by inputs CO1 and CO2, individual monitoring of the monitoring contacts	OFF	
BR	Motor brake monitoring Input number and function of brake monitoring contacts	**OFF**: no brake monitoring connected **1*NC** to **4*NC**: 1, 2, 3 or 4 x NC contact closed when brake is de-energised **1*NO** to **4*NO**: 1, 2, 3 or 4 x NO contact open when brake is de-energised **1*NC+1*NO**: 1 NC contact BR1 and 1 NC contact BR2	depending on motor type	x

Parameter	Description of the parameters	Value range	Ex works	Basic
P1P2	Motor temperature monitoring	**OFF** **PTC**: PTC thermistor according to DIN 44082 **TC**: Thermal circuit breaker **KTY**: KTY84-130 temperature sensor **Pt100**: Temperature sensor **Pt1000**: Temperature sensor	PTC	x
T_P1P2	Triggering temperature for motor monitoring when **P1P2 = KTY, PTC, Pt100** or **Pt1000**	50 … 180°C	130°C	
T_ENC	Period for rotary encoder monitoring Start at output signal MB. Without an input signal, the frequency inverter fails.	0.5 ... 7.0 s	2.0 s	
T_CO	Contactor interruption monitoring time when **CO = CO1** or **CO1&CO2** Time until final stage is switched off. T_CO is active during interruptions to travel, not during a normal stop.	0.00 ... 100.0 ms 0.00 = OFF	10 ms	
T_CDLY	Contactor monitoring delay when **CO = CO1** or **CO1&CO2** Time at the contactor monitoring input until feedback that the motor contactors are closed or open must be received.	0.5 ... 7.0 s	1.5 s	
T_BR	Brake monitoring debounce time The input signal is evaluated with a time delay.	0.01 ... 3.00 s	0.10 s	
S_MB	Maximum distance when **MB=OFF** If rotary encoder impulses are detected when the digital output MB is switched off, an error message is output if the distance is exceeded.	0.10 ... 1.00 m	0.10 m	
I_MAX	Overcurrent protection depending on the rated motor current If a current greater than I_MAX flows for the time **T_I_MAX**, an error is triggered.	20 ... 180%	130%	
T_I_MAX	Error message if **I_MAX** is exceeded within the time T_I_MAX	0.3 ... 10.0 s		
MASK1	Error mask 1 - 5 Suppression of up to 5 error messages through configuring the error number in the mask.	Error number	0	
MASK2			0	
MASK3			0	
MASK4			0	
MASK5			0	

Parameter	Description of the parameters	Value range	Ex works	Basic
MSK_NEG	Error mask negative Use after consultation with ZIE-HL-ABEGG.	Error number	0	

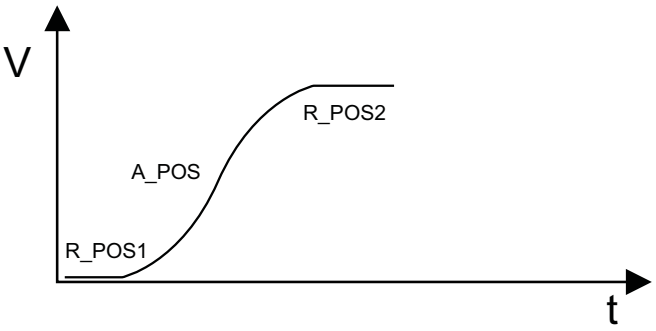
7. Starting

Parameter	Description of the parameters	Value range	Ex works	Basic
M_START	Control method for optimising start-up behaviour	**Off**: RPM control without gain at start K_START=1 **MOD1** **MOD2** **MOD3** **MOD4** **MOD5** *Start-up variants, page 113*	depending on motor type	
K_START	Gain at start Multiplication factor for the Control/ SPD_KP or amplification of the position controller, dependent on the start-up mode	Automatic limitation	1.0	x
T_0	Maximum motor contactor response time When **monitoring/CO = Off,** time from the application of a travel signal until the motor is energised	0.0 … 10.0 s	0.5 s	
T0_real	Measured time required for the contactors to open	Not adjustable	0.0	
T_1	Additional flux build-up time Asynchronous motors: Time until the magnetic field is built up in the motor.	Asynchronous motors: 0.1 … 60.0 s Synchronous motors: Fixed value **0.0**	Asynchronous: 0.1 s Synchronous: 0.0	
T_2	Maximum brake opening time After expiry of **T_1**, the brake must open within T_2.	0.0 … 5.0 s	Asynchronous: 0.6 s Synchronous: 1.8 for MOT_TYPE = SM250: 2.5	
T2_real	Measured brake open time	Not adjustable	0.0	
T3	Acceleration time to V_T3 Within T_3, the drive accelerates to speed **V_T3**	0.0 … 10.0 s	0.0	
V_T3	Target speed for starting ramp T3 Minimum speed to minimise jerk when starting. Within **T_3**, the drive is accelerated to speed V_T3.	0 … 50 mm/s	0.0	

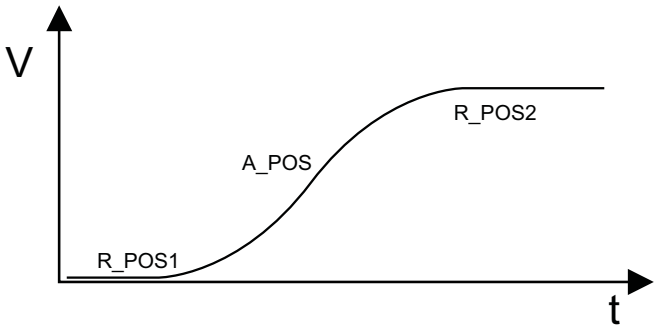
Parameter	Description of the parameters	Value range	Ex works	Basic
s_start	Distance until switch to speed control When **M_START=MOD2 to 4**: if the position of the drive is modified by the parametrised value during the start process, the **K_START** boost is switched off	0.1 … 30 mm	3.0 mm	
BRK_DMP	Noise damping for brake opening	**OFF** **ON**	ON	

8. Accelerating

Parameter	Description of the parameters	Value range	Ex works	Basic
A_POS	Acceleration	0.25 ... 2.00 m/s²	0.5 m/s²	
R_POS1	Rounding bottom The higher, the softer	5 ... 90%	Calculating	
R_POS2	Rounding top The higher, the softer	20 ... 90%	Calculating	



High acceleration with low rounding at top and bottom.



Low acceleration with high rounding at top and bottom.

9. Travelling

Parameter	Description of the parameters	Value range	Ex works	Basic
V_1	Positioning speed when approaching a floor	0.010 ... 0.20 m/s	0.050 m/s	
V_2	Intermediate speed Speed for normal travel, e.g. when travelling to an intermediate floor	0.03 ... 6.50 m/s	0.50 m/s	
V_3	High travelling speed Speed during normal travel	0.00 ... 10.00 m/s	0.95 m/s	
V_Z	Readjustment speed Speed for readjusting the position of the cabin when loading or unloading the cabin	0.003 ... 0.30 m/s	0.01 m/s	
V_4	Additional speed	0.03 ... 3.50 m/s	0.30 m/s	

Parameter	Description of the parameters	Value range	Ex works	Basic
V_5	Additional speed	0.03 ... 3.50 m/s	0.30 m/s	
V_6	Additional speed	0.03 ... 3.50 m/s	0.05 m/s	
V_7	Additional speed	0.03 ... 3.50 m/s	0.05 m/s	

10. Decelerating

Parameter	Description of the parameters	Value range	Ex works	Basic
A_NEG	Negative acceleration	0.12 ... 2.00 m/s²	0.5 m/s	
R_NEG1	Rounding top, The greater, the softer	20 ... 90%	Calculating	
R_NEG2	Rounding bottom, The greater, the softer	20 ... 90%	Calculating	
S_DI3	Switch-off delay for Travel/V3	0.00 ... 2.00 m	0 m	
S_DI2	Switch-off delay for Travel/V2	0.00 ... 2.00 m	0 m	
S_DI1	Switch-off delay for Travel/V	0. ... 150 mm	0 mm	
S_ABH	Distance dependency	**OFF**: with standard, DCP1 or DCP3 and CANopen Lift Velocity mode control: time-dependent deceleration, deceleration paths can vary. **ON (V2...7)**: Distance-dependent deceleration, time-optimised engagement at all travelling speeds. **ON (V2...3)**: Distance-dependent deceleration, time-optimised engagement at V_2 and V_3. **Slow**: Distance-dependent deceleration, engagement with early reduction of engagement speed.	ON (V2 ... 3)	
DCP_FIL	DCPControl: DCP filter type	**Off:** Function deactivated **Opt.2-4:** Function not assigned **Opt.1:** Travel characteristics are optimised during deceleration, only with DCP4 If DCP_FIL = Opt. 1, message at end of travel: DCP cycle time! DCP_FIL = Opt.1	OFF	

11. Stopping

Parameter	Description of the parameters	Value range	Ex works	Basic
T_4	Time at temperature with speed 0 The motor is held for T_4 after reaching speed 0.	0.0 ... 10.0 s	0.1 s	

Parameter	Description of the parameters	Value range	Ex works	Basic
T_5	Time until mechanical brake must be closed	0.0 ... 5.0 s	Asynchronous: 0.6 s Synchronous: 1.5 s when MOT_TYPE = SM250: 2.0	
T_5a	Synchronous motors: additional energising time with brake closed	0.0 … 2.0 s	0.0 s	
T_5b	Synchronous motors: Motor current reduction time for reducing the current supply under a ramp function	0.0 … 2.0 s	0.3 s	
T_6	Motor contactor dropout time: time within which the contacts of the motor contactors must be opened.	0.0 … 10.0 s	0.5 s	

12. Control

Parameter	Description of the parameters	Value range	Ex works	Basic
C_MOD	Operation with or without encoder **FOC** Field-orientated operation **SCIM** Open loop with Scalar control of induction machine operation, see *Control via Scalar Control of Induction Machine operation SCIM, page 88* **U/f** Open loop with control via voltage and frequency U/f, see *Control via voltage and frequency control U/f, page 91*	**FOC** **SCIM** **U/f**	FOC	
SPD_KP	Speed controller basic gain factor: multiplication factor for changing the calculated basic gain **SPD_C** when **C_MOD=FOC**	Automatic limitation	1.00	x
SPD_TI	Speed controller integration time Controller integration time during travel when **C_MOD=FOC**	5 ... 300 ms	100 ms	x
IQ_KP	Current controller gain for torque when **C_MOD=FOC**	0.1 ... 127.0	1.5	x
IQ_TI	Current controller adjustment time for torque when **C_MOD=FOC**	1 ... 50 ms	15 ms	x
NF	Activate noise filter to reduce noise caused by the motor. when **C_MOD=FOC**	OFF ON	OFF	x
NF_F1	Noise filter frequency1: Number of rotor slots when **C_MOD=FOC**	0 ... 1018	0	x

13. Parameter set 2

A 2nd parameter set can be stored in ZAdynpro. This can be used for:

- Emergency evacuation, see *Emergency evacuation, page 82*
- Normal travel with modified parameter values

- Parameter back-up

Parameter	Description of the parameters	Value range	Ex works	Basic
f_PARA2	Function of parameter set 2	**Locked**: 2nd parameter set is blocked **2nd parameter set**: Activation of the 2nd parameter set **EVAC 3**: Emergency evacuation with evacuation unit **EVA. 3*AC**: Emergency evacuation through three-phase current emergency-generator **EVA.1*AC**: Emergency evacuation with UPS **UPS**: Emergency evacuation by UPS with reduced power ZAdyn4Bplus: **EVA.>=110:** Emergency evacuation with supply via DC+/DC- at connection terminal X2	Locked	
U_ACCU	Battery nominal voltage when **f_PARA2 = EVAC 3**	100 ... 565 V	120 V	
P_UPS	Maximum power of the UPS parametrisation when **f_PARA2 = UPS**	0.0 ... 70.0 kW	1.0 kW	
R_U20	Stator resistance when **f_PARA2 = UPS**	0.0 ... 9.99 ohm	1.00 ohm	
STOP	Stop function to increase positioning accuracy in evacuation mode when **f_PARA2 = UPS**	**ON**: Brake is closed when the switch-off point for V_1 is reached. for DCP02-04: The brake will be closed when the residual distance S_STOP is reached. **OFF**: Stop function deactivated	OFF	
COPY	Copy parameter set	**OFF** **PARA1->2**: Copy data from 1st parameter set to 2nd parameter set	OFF	

14. Statistics

Parameter	Description of the parameters	Value range	Ex works	Basic
ST_LST	Error list	Not adjustable	-	x
ST_H	Operating hours	Not adjustable	-	x
ST_DRV	Number of trips	Not adjustable	-	x
ST_HDRV	Number of travel hours	Not adjustable	-	x
ST_UC	Usage category in accordance with VDI 4707	Not adjustable	-	x
ST_RES	Number of grid failures	Not adjustable	-	x

Parameter	Description of the parameters	Value range	Ex works	Basic
ST_SRF	Number of travel interruptions due to interruption of controller enable during travel operation	Not adjustable	-	x
ST_SXO	Number of travel interruptions due to interruption of the STO or CO input signal during travel operation	Not adjustable	-	x
ST_CLR	Delete fault memory **ST_LST, ST_RES, ST_SRF** and **ST_SCO**	**ON** **OFF**	OFF	
CRC_SAF	Checksum of the values set for safety-relevant parameters BR, STO and TD_RES	Not adjustable		x
APD	Automatic parameter diagnostics	**ON** **OFF**	OFF	
RESET	Deletion of parameters, counter statuses and error lists, population of parameters using default values.	**77**: pre-configured ZAdyn with customer-specific system data; standard ZAdyn: Default values **90**: Device reset. ENC_OFF is retained. **99**: Device reset. ENC_OFF is deleted. Synchronous motors: Rotary encoder offset value ECOFF is deleted.		x
TD_PWN	Issue new password for travel direction change counter	0 ... 9999 0 = no password	0	
TD_PW	Password input Travel direction change counter	0 ... 9999	0	
TD_PWC	Encoded display of password for travel direction change counter Contact ZIEHL-ABEGG if the password is lost.	Not adjustable	56370	
TD_SET	Start value for the down counter for the travel direction change counter If the start value of the down counter is set to 0.00, the down counter is deactivated.	0.00 ... 16.77 M 0.00 = OFF	0.00	
TD_RST	Restore counter reading for travel direction changes from motor rotary encoder	**ON** **OFF**	OFF	

15. Memory card

Parameter	Description of the parameters	Value range	Ex works	Basic
SAV_ALL	Save all data under serial number allocation on a memory card.	**ON**: Saves parameter list .PRT, error list .FLT, parameter .PA3 and black box .BOX in folder /4CX/DEVICE/[serial number]/LST The parameter is OFF after saving **OFF**	OFF	x

Parameter	Description of the parameters	Value range	Ex works	Basic
SAV_PAR	Save parameters to memory card for identical 2nd system.	**ON**: Copies and saves the parameter .PA3 in the /4CX/DEVICE/FORCE folder No allocation of the serial number, the data is overwritten with each saving process. The parameter is OFF after saving **OFF**	OFF	x
LOD_PAR	Load parameters from memory card for 2nd identical system.	**27**: Parameters .PA3 are loaded to the frequency inverter from the /4CX/DEVICE/FORCE folder. The parameter is OFF after loading.	0	x
UPDATE	Firmware update code Dependent on serial number and firmware version, see *Performing a firmware update, page 86*	0 to 65535	0	
SAV_CFG	Save parameters and parameter list in to the folder /4Cx/CONFIG/Configuration number.	0 ... 65535	0	
LOD_CFG	Load parameters from memory card with configuration number.	Enters the assigned configuration number from SV_CFG **0 ... 65535** The parameter is Off after loading	0	
DIR_NUM	Number of the destination folder for saving	0 ... 65535 0 = Serial number of the frequency inverter	0	
Format	Format the memory card	**27**: Folders and files are deleted	0	

16. MMC recorder

Take measurements without a notebook; these are stored on the integrated memory card.

Parameter	Description of the parameters	Value range	Ex	Basic
REC_MOD	Recorder settings when **REC_CFG = 0**	**OFF** **ON**: The travel curve is saved **Stop&Shot**: Manually stops and saves a measurement started by REC_MOD = ON. Then REC_MOD is set to OFF. **ZAmon**: Using with ZAmon software	OFF	
REC_CFG	Configuration of measuring channels	**0:** Measurement channels and the recording time can be freely configured **1** to **199**: fixed configurations		
TRIG_BY	Trigger source Criterion for stopping the recorder and saving the data to the memory card.	**Error**: Save as soon as an error occurs **Err/Stop**: Save as soon as an error occurs or error-free travel is finished **Cont.**: without function **Interval**: without function **Ext.Input**: without function		

Parameter	Description of the parameters	Value range	Ex	Basic
T_REC	Recording time of a measurement with 1024 measured values, intervals depending on recording time	**5 s | 10 s | 15 s** **20 s | 40 s | 80 s** **160 s | 0.5 h | 1 h | 18 h**	5 s	
T_DLY	Trigger delay time Time from occurrence of error to end of recording	0.5 s	0.5 s	
CHN1	Configuration of measuring channels 1 - 4 Analogue measurement values **1**: Setpoint for travelling speed m/s **3**: Actual travelling speed value m/s **6**: Status of frequency inverter **49**: calculated shaft position in cm **142**: DC-link voltage in V **143**: Torque-forming current in A **152**: Magnetisation current in A **181**: Setpoint speed in rpm **180**: Actual speed in rpm **213**: Remaining distance specification in m **214**: Braking distance in m **215**: Target speed specification in m/s	0 ... 299	3	
CHN2			1	
CHN3			143	
CHN4			6	
CHN5	Configuration of measuring channel with 16 digital measured values **89**: Inputs and outputs with function display **90**: Brake monitoring inputs and outputs **91**: Inputs and outputs **92**: DCP command and status bits **118:** CAN bits in velocity mode **137:** CAN bits in position mode	0...299	89	

17. Encoder calibration for synchronous motors

Parameter	Description of the parameters	Value range	Ex works	Basic
ENC_ADJ	Rotary encoder position adjustment	**OFF** **Check**: Load-free check of rotary encoder calibration **Load-free**: Load-free calibration of rotary encoder **Braked**: Rotary encoder calibration with closed brake **Stick mag.:** Start of magnet adhesion process during operation with Kone EcoDisc drive. **Mag. exist.:** Replacement of ZAdyn without magnet adhesion process with Disc Control drive	OFF	
ENC_POS	Numerical display of the absolute position of the rotary encoder per revolution: 0 … 4x ENC_INC-1	Not adjustable	-	
ENC_OFF	Correction value for rotary encoder offset Offset value for rotary encoder calibration with closed brake.	0 ... 360.00°	0°	
SAV_P_E	For EnDat, Hiperface or BiSS C absolute encoders, save the parameters to the encoder via the electronic name plate. Stores data in the absolute encoder via electronic name plate	**ON**: Store data from the frequency inverter in the absolute encoder. **OFF**	OFF	
LOD_P_E	For EnDat, Hiperface or BiSS C absolute encoders via the electronic name plate function	0 to 65535 27: Data are read out from the absolute encoder into the frequency inverter	0	

18. Safety catch

Parameter	Description of the parameters	Value range	Ex works	Basic
SB_MOD	Capture release	**OFF** **ON**: Start the capture release UP or DOWN with the inspection run UP or inspection run DOWN key.	OFF	
SB_M	Impulse amplitude for the current supply to the motor as a percentage of the maximum operating current of the frequency inverter: Nominal current x 1.8	10 ... 100%	70%	
SB_T0	Impulse pause Break between individual current pulses	0.1 ... 2.0 s	0.2 s	

Parameter	Description of the parameters	Value range	Ex works	Basic
SB_T1	Impulse time Time for which the motor is energised	0.1 ... 1.0 s	0.5 s	
SB_N	Number of impulses	1 ... 5	3	

19. HW ident.

Parameter	Description of the parameters	Value range	Ex works	Basic
ID_NOK	Number of modified hardware identifications			

20. Power unit

Parameter	Description of the parameters	Value range	Ex works	Basic
M_PWM	Operating mode of pulse width modulation PWM	**Auto**: The PWM frequency is modified depending on the temperature at the power unit and the load. **Fix f_PWM**: The motor voltage is permanently cycled at the PWM frequency set in the parameter “f_PWM”.	Auto ZAdyn 050-074: Fix f_PWM	
f_PWM	Minimum clock frequency when **M_PWM = Fix f_PWM** or **M_PWM = AUTO**	ZAdyn 011-074: 3.7 ... 10.0 kHz ZAdyn 110-220: 3.7 ... 8.0 kHz	ZAdyn 011-074: 8.0 kHz ZAdyn 110-220: 3.7 kHz	
f_PWM_H	Maximum clock frequency when **M_PWM = Auto**	ZAdyn 011-074: 5.0 ... 16.0 kHz ZAdyn 110-220: 5.0 ... 8.0 kHz	ZAdyn 011-074: 16.0 kHz ZAdyn 110-220: 7.4 kHz	
UDC_N	Nominal voltage for DC-link	100 ... 680 V	565 V	
UDC_MIN	Minimum limit value for DC-link voltage	90 ... 565 V	450 V	
UDC_MAX	Maximum limit value for DC-link voltage	100 ... 760 V	760 V	
FAN_T	Fan switch-on temperature	28 ... 60°C	50°C	

21. Tests

Parameter	Description of the parameters	Value range	Ex works	Basic
SCY_EN	Release of test functions	**OFF** **ON**: Functions available. After a test, the respective parameter is set to OFF again.	OFF	

Parameter	Description of the parameters	Value range	Ex works	Basic
SCY_ENC	Rotary encoder test	**OFF** **ON**: Failure of the rotary encoder is simulated	OFF	
SCY_TMP	Motor temperature test	**OFF** **ON**: Failure of the motor temperature module or motor overtemperature is simulated	OFF	
SCY_A3	Testing the protective device in compliance with EN81	**OFF** **No current**: Moves the car by opening the brakes without the output stage being energised **Max.accel.**: Cabin is accelerated to maximum under full current supply	OFF	
SCY_SG	Safety catch test	**OFF** **ON**: electronic short-circuit is deactivated; NOT for ZAdynpro	OFF	
SCY_DA	Traction condition test For CAN actuation	**OFF** **ON**: Display of car movement during travel with recovery and counterweight attached	OFF	
SCY_MB	Motor brake test For CAN actuation	**OFF** **ON**: Display of braking distance in the event of an open circuit in the safety circuit	OFF	

22. ZA Intern

Parameter	Description of the parameters	Value range	Ex works	Basic
PW_S9	Password for additional parameters		0	
UVW_CHK	Definition of motor phase check during start	**OFF** **Single**: Check during the 1st trip after switching on the frequency inverter. If the check is faulty, a check is carried out at the start of each trip until a fault-free check is carried out. **Cont**: Check at the start of each trip.	Single	
UVW_PEK	Test voltage for UVW_CHK	**1 ... 10 V**: Selects the test voltage between 1 V and 10 V. In the event of a fault, display of the test voltage. **15 V**: Test voltage = 15 V **f(P)** Test voltage dependent on motor power, see motor name plate. In the event of a fault, display of the test voltage.	f(P)	

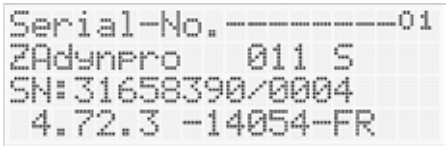
23. INFO menu

Easily accessible overview with numbered pages about:

- Current measured values

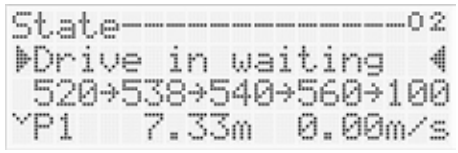
- Current operating states
- Current switching statuses of inputs and outputs
- Internal inverter measurements
- Information on internal assemblies
- Display of binary functions: small dot = off, large dot = on

Serial-No. 01



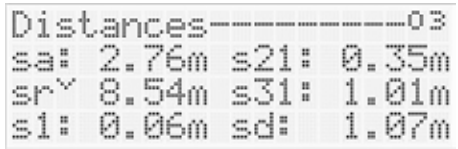
Line 2	Line 3	Line 4
Display of frequency inverter type and size	Serial number/device type with sequential number	Firmware version Loaded 3rd operating language

State 02



Line 2	Line 3	Line 4
Display of operating state in plain text display, see *Operating states, page 150* Currently displayed between the arrows **> <** Previous displayed between the arrows **< >**	Display of the last 4 operating states on the left; current state on the right. Query of the last 60 operating states: ▫ Back ESC key ▫ Next Enter key	from left to right: ▫ Direction of travel ▫ Current parameter set P1 or P2 ▫ Position of cabin in shaft ▫ Travelling speed

Distances 03



Display can be frozen with the enter key

Line 2	Line 3	Line 4
sa: Position of cabin in shaft **s21**: calculated deceleration path V_2 → V_1 **s20**: calculated deceleration path V_2→ standstill; only DCP02 or DCP04	**sr**: Direction of travel, total distance travelled **s31**: calculated deceleration path V_3 → V_1 **s30**: calculated deceleration path V_3 → standstill; only DCP02, DCP04 or CAN position mode.	**s1**: Travel path with positioning speed V_1; not for DCP02 or DCP04 **sd**: actual deceleration path V_3 → V_1 or V_2 → V_1

Mot 04



Display can be frozen with the enter key.

Line 2	Line 3	Line 4
Motor speed bar display Asynchronous motors: Slip in %. If the motor data is set up correctly, the slip is proportional to the rated motor current, e.g. 50% motor current = 50% slip. Synchronous motors: Load angle in °	Actual current motor speed Motor voltage	Setpoint motor speed **prog** Motor current

MotDat 05

Motor data entered in the Motor name plate menu.





Line 2	Line 3	Line 4
Nominal current **I** Nominal speed **n**	Asynchronous motors: ▫ cos phi **cos** ▫ Rated frequency **f** Synchronous motors: ▫ Nominal voltage **U** ▫ Rated frequency **f**	Asynchronous motors: ▫ Magnetisation current **I0** ▫ Rotor time constant **TR** Synchronous motors: ▫ Number of pole pairs **p**

MotDatFW 05

Motor data calculated for operation in field weakening range.



Line 2	Line 3	Line 4
Nominal current **I** Nominal speed **n**	Asynchronous motors: cos phi **cos** Rated frequency **f**	Asynchronous motors: Magnetisation current **I0** Rotor time constant **TR**

MotDatNom 05

Original motor data can be displayed with the enter key.



Line 2	Line 3	Line 4
Nominal current **I** Nominal speed **n**	Asynchronous motors: cos phi **cos** Rated frequency **f**	Asynchronous motors: Magnetisation current **I0** Rotor time constant **TR**

RegLimits 06

Online display of whether a control circuit has reached the limit.



Line 2	Line 3	Line 4
SP: RPM controller **IQ**: Current controller, torque-forming current **ID**: Current controller, flux-forming current **PS**: Position controller **U**: Voltage limit of frequency inverter	Dot left: minimum limit reached Dot right: maximum limit reached	Left alarm bell: Minimum limit reached during previous trip Right alarm bell: Maximum limit reached during previous trip NO alarm bell during fault-free trip

Brake-Chopper 07



Display can be frozen with the enter key.

Line 2	Line 3	Line 4
Brake resistor: Internal PWM frequency Status of function monitoring and temperature monitoring at input terminal BC: large dot = ok	DC-link voltage The DC-link voltage displayed when at a standstill must correspond to line connection voltage x 1.41. Power loss as an average over 120 s.	Brake resistor: Modulation as a bar display and utilisation in % as an average value over 120 s.

CU-Functions 08



Line 2	Line 3	Line 4
Control configuration in the Control/ CONFIG menu	Input functions: ▫ Controller enable RF ▫ Direction of travel RV ▫ Travelling speed V_ in m/s	Active digital output functions

Start/Stop 09



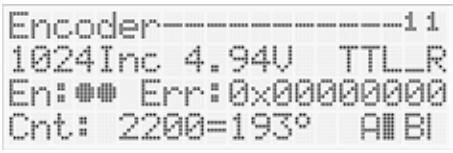
Line 2	Line 3	Line 4
STOA: Status of input STO_A **STOB**: Status of input STO_B Large dot next to the designation = Signal is present at the input and no error has been detected by diagnostic system. If no signal is present, the output stage is safely locked because STO is activated. **DIAG**: Status of the internal diagnostic unit Large dot next to the designation = No error detected. No dot = Error detected	**RF**: Controller enable input **RB**: Controller ready or contactors switching at output **CO**: Contactor monitoring at input **MB**: mechanical brake switching output **BRx**: Brake monitoring contact **!** under monitoring inputs CO or BR = Monitoring functions are disabled in the Monitoring menu.	**RF, RB, CO, MB, BRx:** Large dot under the designation = Input or output active Right to **->** status of brake release monitoring: **C** = all brakes closed **O** = all brakes open ! = different status of brakes Enter key: Display of difference in brake closing time

CU-Ports 10



Line 2	Line 3	Line 4
Brake monitoring inputs BR1 to BR4 Large dot after BR1...BR4 = Input active	1-8: Digital inputs 1 to 8 B: Function monitoring and temperature monitoring for brake resistor or brake chopper C12: Contactor monitoring 1-5: Digital outputs 1 to 5	Large dot under designation = Input or output active

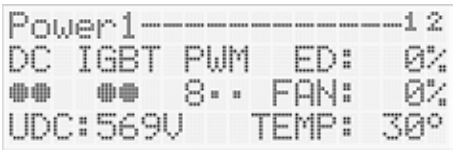
Encoder 11



Display can be frozen with the enter key.

Line 2	Line 3	Line 4
Rotary encoder resolution Rotary encoder supply voltage Absolute encoder: Rotary encoder type or incremental encoder: Rotary encoder type	**En** 1st dot: Enable supply voltage for absolute encoder **En** 2nd dot: Functional test of absolute encoder Both points must be active Asynchronous motors: **ERR** = Rotary encoder fault code, NO error = 0	**Cnt**: Counter reading for impulse counter, 0 ... 4x encoder resolution and motor revolution in degrees; 360° = 1 revolution of the motor **A B**: Graphical representation of sine signal A, cosine signal B

Power1 12



Display can be frozen with the enter key.

Line 2	Line 3	Line 4
DC: 1st dot: Precharge relay on, 2nd dot: Precharge relay OK. Both dots are visible during normal operation. **IGBT**: 1st dot: Power supply to power unit on, 2nd dot: Power unit power supply OK. Both dots are visible during normal operation. **PWM**: Clock frequency of the output stage in kHz; 1st dot: PWM power unit enabled, 2nd dot: Status of PWM power unit OK. Both points are visible during travel. **ED**: Frequency inverter on time; time interval: 10 minutes **FAN**: Fan speed in % Push the enter key: Temperature module print in line 3, right MP:xxxC.		**UDC:** DC-link voltage **Temp:** Power unit temperature

Power2 13

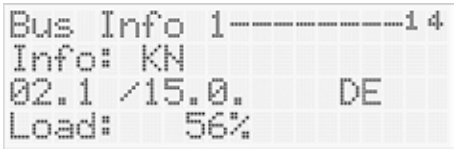
During normal operation, no dots or phase displays should be active. In the event of a fault, the displays are active until the next travel command, exception ERR_EXT.



Line 2	Line 3	Line 4
ERR_EXT: Overcurrent message display is not saved, dot = overcurrent **U**: DC-link overvoltage fault, voltage > 850V DC **OC**: Overcurrent detected by current sensors, indication of faulty phase or DC-link	**SRC_APP**: Overcurrent detected by application processor **U_ZK**: DC-link voltage display	**SRC_MOP**: Overcurrent detected by motor management processor **UCE:T**: Error in power unit's upper current path, faulty phase display **UCE:B**: Error in power unit's lower current path, faulty phase display With the enter button pressed: **RDY:** Ready signals for queries at ZIEHL-ABEGG.

DCP control

Bus Info 1 14



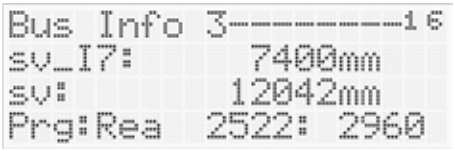
Line 2	Line 3	Line 4
Manufacturer	Control firmware version Control firmware date Operating language set in the control system, display according to ISO639. The operating language of the frequency inverter is automatically adapted.	DCP4: Load in %; 0% = Cabin empty Load-dependent starting torque current

Bus Info 2 15



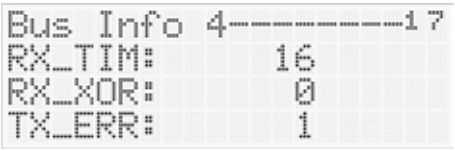
Line 2	Line 3	Line 4
B= Command byte **G**= Speed byte	**S** = Status byte Current operating state of frequency inverter	Display of current travel commands: **RF**: Controller enable Direction of travel Activated travelling speed ZAdyn4: **MTW** Motor temperature pre-warning at overtemperature

Bus Info 3 16



Line 2	Line 3	Line 4
Deceleration path Deceleration path calculated before travel.	Remaining distance Updated during travel.	**Prg:Rea**: Travel path determined from the motor rotary encoder after normal travel: calculated from the shaft encoder; target ratio 1:1.

Bus Info 4 17

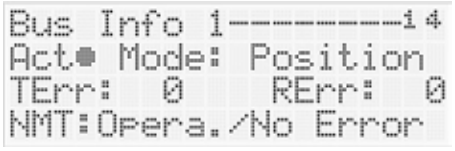


Transmission error: Counter readings increase during operation.

Line 2	Line 3	Line 4
RX_TIM: Timing. The control does not respond within the cycle time.	**RX_XOR**: erroneous control telegram detected by the frequency inverter	**TX_ERR**: erroneous frequency inverter telegram detected by the control

CANopen Lift operation

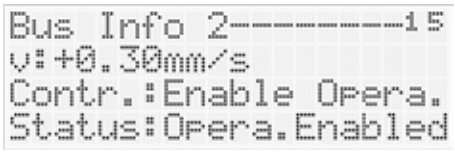
BUS Info 1 14



Line 2	Line 3	Line 4
Act: 1 dot = ZAdyn set to CAN **Mode**: Operating mode: Velocity or Position	**RErr**: Receive buffer error counter **TErr**: Send buffer error counter	**NMT**: current status of network management status BootUp: ZAdynpro switches to the bus Stop: ZAdynpro stopped Preop.: ZAdynpro can be parametrised, switch to *operational* before the trip. Status Opera.: ready for operation No error: no error Warn.Lim.: over 127 errors Bus off: disconnected from bus as there are more than 255 errors

Bus Info 2 15

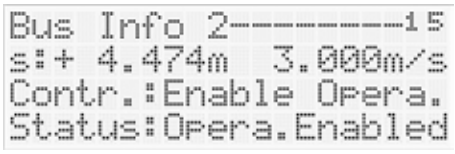
Velocity mode



Line 2	Line 3	Line 4
V_CAN: Speed of control at frequency inverter	**Contr.**: Control byte commands from control	**Status:** Status byte. CAN statuses of frequency inverter

Bus Info 2 15

Position mode

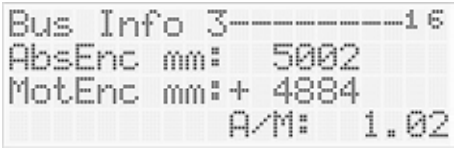


Enter key: Display of maximum speed sent by the control

Line 2	Line 3	Line 4
s: Relative target position that is sent from the control to the ZAdynpro Travelling speed	**Contr.**: Control byte. Control commands	**Status**: Status byte. CAN statuses of frequency inverter

Bus Info 3 16

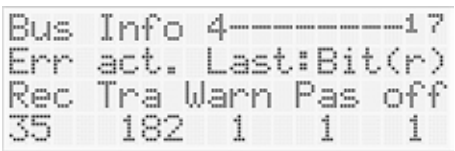
Calibration of distances via rotary encoder and shaft encoder



Line 2	Line 3	Line 4
AbsEnc mm Travel distance determined via the absolute encoder	**MotEnc mm** Travel distance calculated via the motor rotary encoder	Ratio between the two travel distances, setpoint ~ 1.00

Bus Info 4 17

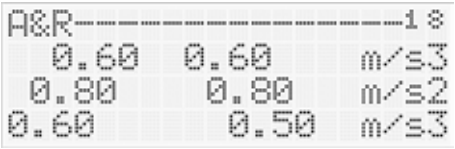
Calibration of distances via rotary encoder and shaft encoder



Line 2	Line 3	Line 4
Error: Err act. = Error active Warning Err pass = Error passive Bus off **Last**: last error No Err = no error Stuff = Stuffing error Form = Form error ACK = Acknowledge error Bit(r) = Bit error; recessive level output, dominant level detected Bit(d) = Bit error; dominant level output, recessive level detected	**Rec**: Number of receive errors **Tra**: Number of transmit errors **Warn**: Number of switching operations in warning state **Pas**: Number of switching operations in error passive state **off**: Number of switching operations in bus off state	Number of errors or number of switching operations

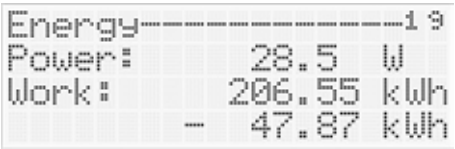
A&R 18

Parametrised acceleration and deceleration values based on the travel curve during normal travel



Line 2	Line 3	Line 4
Upper rounding of acceleration in m/s³ Upper rounding of deceleration in m/s³	Acceleration in m/s² Deceleration in m/s²	Lower rounding of acceleration in m/s³ Lower rounding of deceleration in m/s³

Energy 19



Line 2	Line 3	Line 4
Power: current frequency inverter power in watts	**Work:** energy meter, indication of the work performed in watt hours.	Energy meter, indication of the work generated in watt hours

InfBus 20

Frequency inverter configuration

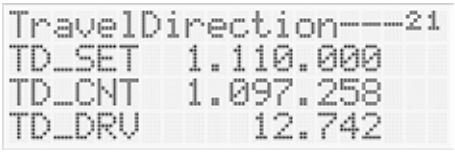


Line 2	Line 3	Line 4
Ident. no. internal assemblies 0: Controller unit CU 1: Shunt module CUSH 2: reserved 3: reserved 4: ZAdyn 040-074: reserved ZAdyn 110-220: Sensor module SM 5: ZAdyn 040-074: Switching power print SP ZAdyn 110-220: Master print MP 6: ZAdyn 040-074: Power unit PU ZAdyn 110-220: Thyristor control TC 7: ZAdyn 040-074: DC-link DC ZAdyn 110-220: IGBT drive phase U ID 8: IGBT drive phase V ID2 9: IGBT drive phase W ID3 A: IGBT drive BR ID4 B: MASH	Marking of existing assemblies in the frequency inverter: x: Identification of the assembly by reading out the EEPROM m: Identification of the assembly by manual specification in the HW-Ident. menu.	Fault assignment to assemblies 0: error-free operation 1: no answer 2: incorrect or unknown object 3: no correct termination of EE-PROM 4: missing or unknown part number 5: missing or unknown index 6: Original and backup copy not identical Error-free operation =0 behind all assemblies

TravelDirection 21

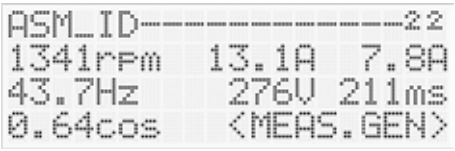
Values of the travel direction change counter

If not used: **not used**



Line 2	Line 3	Line 4
TD_SET: Start value for downward counter Enter key: **TD_RES**: current number of counter resets	**TD_CNT**: Counter for travel direction changes Number of possible travel direction changes with current suspension means.	**TD_DRV**: Total counter for travel direction changes. Remains active even when the travel direction change counter is set again.

ASM_ID 22



Line 2	Line 3	Line 4
Determined motor speed Determined motor current Determined magnetisation current	Determined frequency Determined motor voltage Determined rotor time constant	Determined cos phi Status text, factor by which the original values have been corrected Enter key pressed: Determined cos phi Magnetisation current x rotor time constant

CUEC 23



Line 2	Line 3	Line 4
Func: Availablefunctions on the Control extension card	-	**Stat:** Status of the status LEDs for the Control extension card

CUSH 24



Line 2	Line 3	Line 4
Type: Shunt module part number and index	**I**: Frequency inverter nominal current	**I_max**: Frequency inverter maximum current

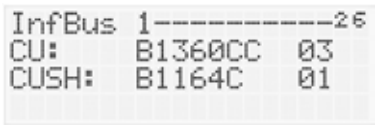
CUMT 25

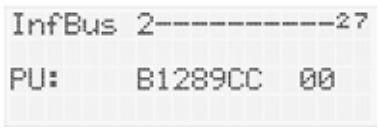


Line 2	Line 3	Line 4
Type: Motor temperature recording ▫ Integrated ▫ NO card	**P1P2**: Motor temperature sensor	**R**: Resistance in ohm OPEN = no sensor connected

InfBus 1 26 - 28

Article number and index of the printed circuit board: Controller unit, shunt module and power unit

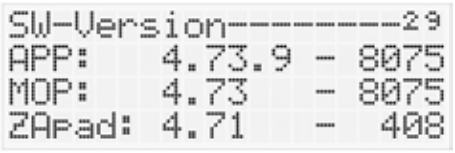






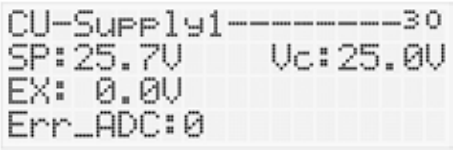
SW version 29

Software version with date, format DDMMY = 08/07/2025



Line 2	Line 3	Line 4
APP Application	**MOP** Motor control	**ZApad**: Software version, hardware version

CU supply1 30



Line 2	Line 3	Line 4
SP: Switching power supply output voltage **Vc:** CU supply voltage	**EX:** external supply voltage of the CU	**Err_ACD**: Fault code for ADC converter controller 0 = No error

CU supply2 31

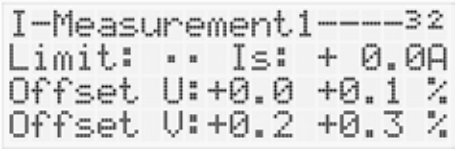
Measured, internal operating voltage of the CU



Line 2	Line 3	Line 4
125 = 1.25V measured voltage **Ref:** Reference controller	 15**P** = **+** 15V measured voltage	3V3 = 3.3V measured voltage 15**N** = **-** 15V measured voltage

I-measurement1 32

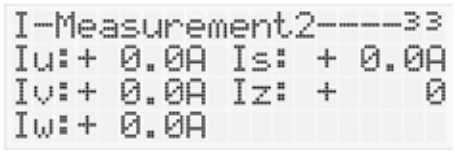
Info page 1 Current detection



Line 2	Line 3	Line 4
Limit: Current detection limit reached 1st dot current Small dot = current limit value currently not exceeded Large dot = current limit value currently exceeded 2nd dot peak detection Small dot = current limit value not exceeded during previous trip Large dot = current limit value exceeded during previous trip **Is**: Total current	**Offset U**: ADC current measurement offset adjustment, phase U, in amperes and as a percentage	**Offset V**: ADC current measurement offset adjustment, phase V, in amperes and as a percentage

I-measurement2 33

Info page 2 Current detection



Line 2	Line 3	Line 4
Iu: Motor current phase U **Is:** Total current	**Iv:** Motor current phase V **Iz:** DC-link current	**Iw:** Motor current phase W

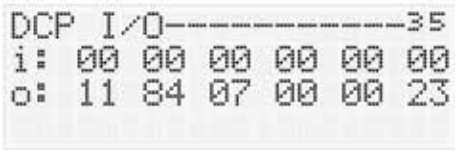
RSA422 34



Line 2	Line 3	Line 4
TXD: Bytes sent to X-PAD **RXD**: Bytes received from X-PAD	**DMA**: Fault counter, DMA transfer not completed. **PTY**: Fault counter parity incorrect	**FRM**: Fault counter, stop bit not received correctly. **OVR**: Overrun error

DCP I/O 35

Display values of the 6 bytes of the DCP master/slave telegrams

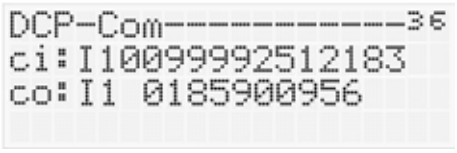




DCP communication faulty, control is not sending command bytes

Line 2	Line 3	Line 4
i: 6 input bytes in HEX Control command bytes	**o:** 6 output bytes in HEX Frequency inverter status bytes	-

DCP-Com 36



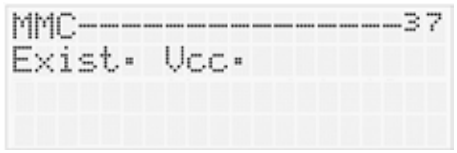


DCP communication faulty, control is not sending command bytes

Line 2	Line 3	Line 4
ci: Control input data	**co:** Frequency inverter output data	-

MMC 37

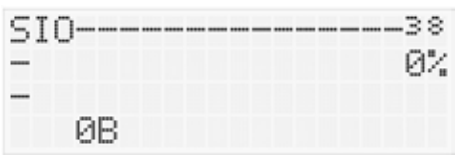
Memory card information



Line 2
Exist: small dot = no memory card, large dot = memory card present **Vcc:** large dot = supply voltage to the memory card switched on

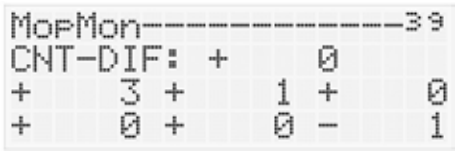
SIO 38

INFO page SIO, from software version 4.70 without function



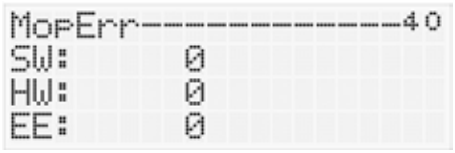
MopMon 39

Internal values, MOP monitor



MopErr 40

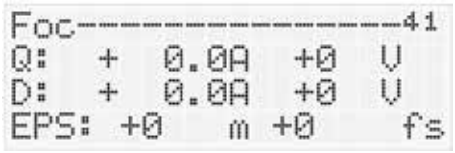
Display of internal fault codes



Line 2	Line 3	Line 4
SW: Software or parameter error	**HW:** Hardware error	**EE:** Encoder input error

Foc 41

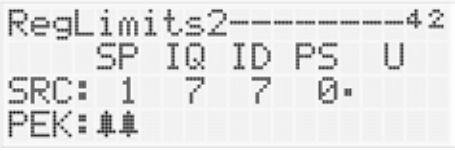
Display of measured values from FOC control



Line 2	Line 3	Line 4
Q: Torque-forming current with associated voltage	**D:** Magnetisation current with associated voltage	**EPS:** Mechanical angle of rotation **m** Electrical angle **fs**

RegLimits2 42

Control circuit limitation



Line 2	Line 3	Line 4
SP: RPM controller **IQ:** Current controller, torque-forming current **ID:** Current controller, flux-forming current **PS:** Position controller **U:** Voltage limit of frequency inverter	Setting for control circuits SP, IQ, ID and PS Small dot = position correction at start not active Large dot = position correction at start active if **BRK = ON**	**PEK:** Alarm bell left: minimum limit reached in previous journey Alarm bell right: maximum limit reached in previous journey NO alarm bell during fault-free normal travel

Recorder 43

Values of the 5 measuring channels used on the standard recorder



Line 2	Line 3	Line 4
Measuring channel 1 and 2	Measuring channel 3 and 4	Measuring channel 5

Rotary encoder aliasing 44

ZIEHL-ABEGG internal: Frequencies that lead to errors caused by the sampling rate when scanning the rotary encoder signal



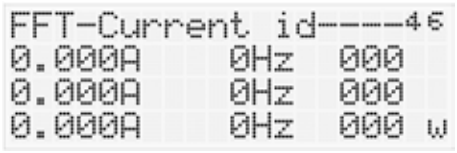
FFT speed 45

ZIEHL-ABEGG internal: Analysis of overlapping frequencies during speed measurement



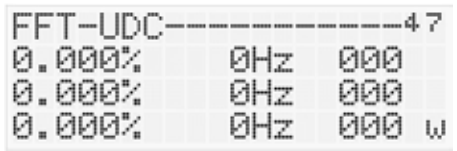
FFT current id 46

ZIEHL-ABEGG internal: Analysis of overlapping frequencies during current measurement



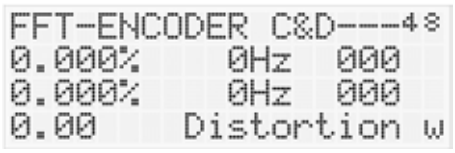
FFT-UDC 47

ZIEHL-ABEGG internal: Analysis of the superimposed frequencies during voltage detection for the DC-link



FFT-ENCODER C&D 48

ZIEHL-ABEGG internal: Analysis of overlapping frequencies during analogue position detection



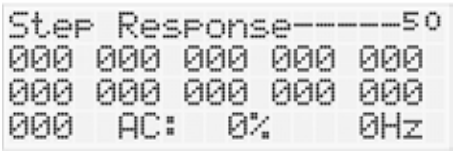
RESONANCE FINDER 49

ZIEHL-ABEGG internal: Display of resonance frequencies that occur



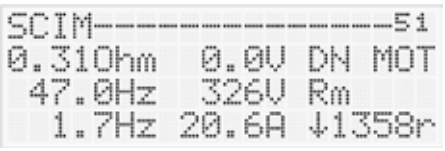
Step response 50

ZIEHL-ABEGG internal: Depiction of the current controller's step response

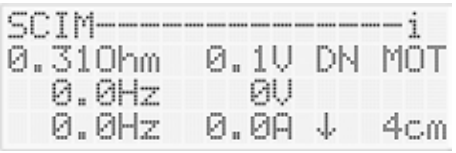


SCIM51

In operation



At a standstill



Line 2	Line 3	Line 4
Measured stator resistance in ohms Current U/I characteristic curve correction in V <u>Load detection*:</u> **UP REG** **DN MOT** **UP MOT** **DN REG** **ZERO**	Stator frequency in Hz Absolute motor ACTUAL voltage in V Status: **S** Start **R** Run **H** Hold Load type: **m** motorised **r** generative Limitations, if any: **v** Warning: Round-trip journey **a** Warning: Acceleration limit **u** Info: Voltage limit	Slip frequency in Hz Absolute motor ACTUAL current in A ↑ UP ↓ DOWN In operation: Specified speed in revolutions per minute At a standstill: Creep path in cm.

*<u>Load detection</u>, when RV1 = UP

Display line 2	Direction of travel	Energy	Situation
UP REG	UP	REGENERATIVE	Cabin - Empty UP
DN MOT	DOWN	MOTOR	Cabin - Empty DOWN
UP MOT	UP	MOTOR	Cabin - Full UP
DN REG	DOWN	REGENERATIVE	Cabin - Full DOWN
ZERO	UP or DOWN	ZERO or Unknown	▫ Randomly balanced load or ▫ Incorrect braking timing or ▫ Use of self-locking gearbox

9.2 Operating asynchronous motors in the field weakening range

If the required motor speed n* for an asynchronous motor is above the nominal speed n of the motor during operation, the ZAdynpro automatically switches over to operation in the field-weakening range.

The magnetisation current I_0 is reduced over the entire speed range. In the motor data, the cos phi is increased and the required speed of the motor is reached.

The original and recalculated motor data can be compared in the **Info menu MOTDat page 05**.

9.3 Serial communication

9.3.1 Drive control & position DCP

Serial control of the ZAdynpro via an RS485 interface only for article numbers with the **suffix DCP**. The two-directional serial control transmits the control signals via a 2 or 3-wire connection cable. The X-IN and X-OUT cables are not required.

DCP protocols

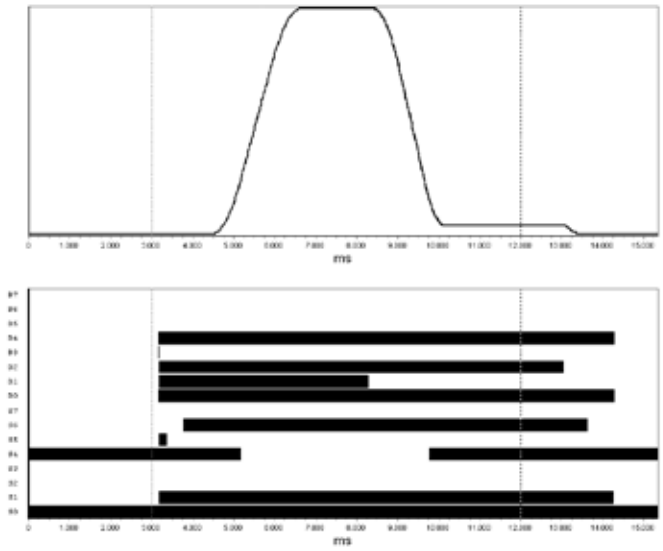
The elevator control transmits the control signals, e.g. controller enable, direction of travel and speed, to the ZAdynpro as command bits and receives the status messages back as status bits, e.g. signals for mechanical brake, motor contactors, STO function or speed monitoring.

	DCP_01	DCP_02	DCP_03	DCP_04
Control signals as command bits	x	x	x	x
Response status messages as status bits	x	x	x	x
Travel based on remaining distance*	-	Prerequisite: ▫ Absolute encoder in the shaft for specifying the remaining distance ▫ Input of the braking distance in the control	-	Prerequisite: ▫ Absolute encoder in the shaft for specifying the remaining distance ▫ Input of the braking distance in the control

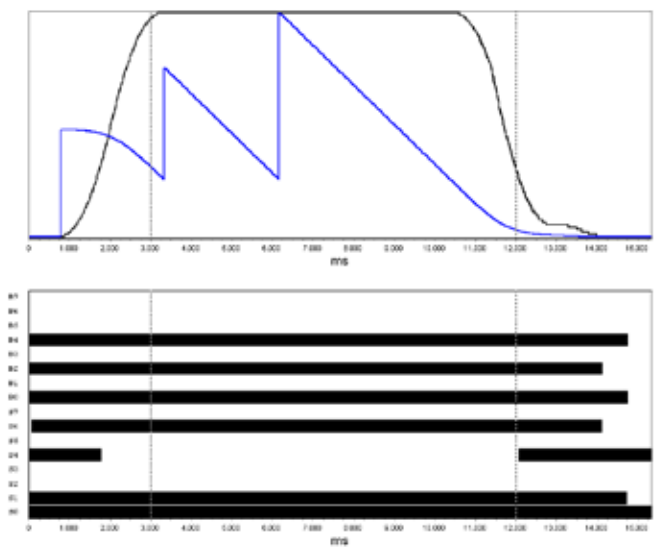
	DCP_01	DCP_02	DCP_03	DCP_04
Added value	-	-	▫ Higher data transmission ▫ Faster communication channel ▫ Automatic compatibility checking between the ZAdynpro firmware and the control firmware	▫ Higher data transmission ▫ Fast communication ▫ Automatic compatibility checking between the ZAdynpro firmware and the control firmware ▫ Braking distance transmission

* Based on remaining distance, i.e. the control specifies the distance to the next floor with the start command. This distance is constantly updated = remaining distance. The cabin moves directly to the floor without creeping speed in a time-optimised and smooth manner. Using the braking distance entered and the current remaining distance, the control system can decide during travel whether it is still possible to stop in the event that a corresponding command is received. If no command is received by the necessary deceleration path, then the remaining distance is extended by an additional floor.

Signal path DCP_01 and DCP_03



Signal path DCP_02 and DCP_04



Command byte		Speed byte		Status byte	
B0	Controller enable RF	G0	Slow travelling speed V1	IS0	Frequency inverter ready for next run
B1	Travel command start	G1	Readjustment VZ	S1	Travel active RB
B2	Switch, switch-off, V1	G2	Speed 0	S2	Pre-warning active
B3	Travelling speed	G3	Recovery V5	S3	Group fault active ST1
B4	Travel direction RV1 or RV2	G4	Inspection V4	S4	Speed monitoring active VG1
B5	Speed change	G5	Additional speed V6	S5	Quickstop
B6	Transfer of remaining distance	G6	Intermediate speed V2	S6	Mechanical brake MB
B7	Error in last telegram	G7	Fast speed V3	S7	Error in last telegram

The bytes can be found in the **Info menu/Page 15 Bus Info 2**.

Configure in DCP mode

▷ Activate the interface in the **Control/CONFIG** menu:

Manufacturer	DCP protocol	Values
BÖHNKE + PARTNER	DCP1	04:BP_DCP1
	DCP2	05:BP_DCP2
	DCP3	06:BP_DCP3
	DCP4	07:BP_DCP4
Kollmorgen Steuerungstechnik	DCP3	09:KN_DCP3
	DCP4	10:KN_DCP4
NEW LIFT	DCP3	12:NL_DCP3
SCHNEIDER STEUERUNGSTECHNIK	DCP3	14:SS_DCP3
	DCP4	33:SS_DCP4
STRACK LIFT AUTOMATION	DCP3	22:ST_DCP3
	DCP4	23:ST_DCP4
Weber Lifttechnik	DCP1	17:WL_DCP1
	DCP2	18:WL_DCP2
	DCP3	19:WL_DCP3
KW AUFZUGSTECHNIK	DCP3	26:KW_DCP3

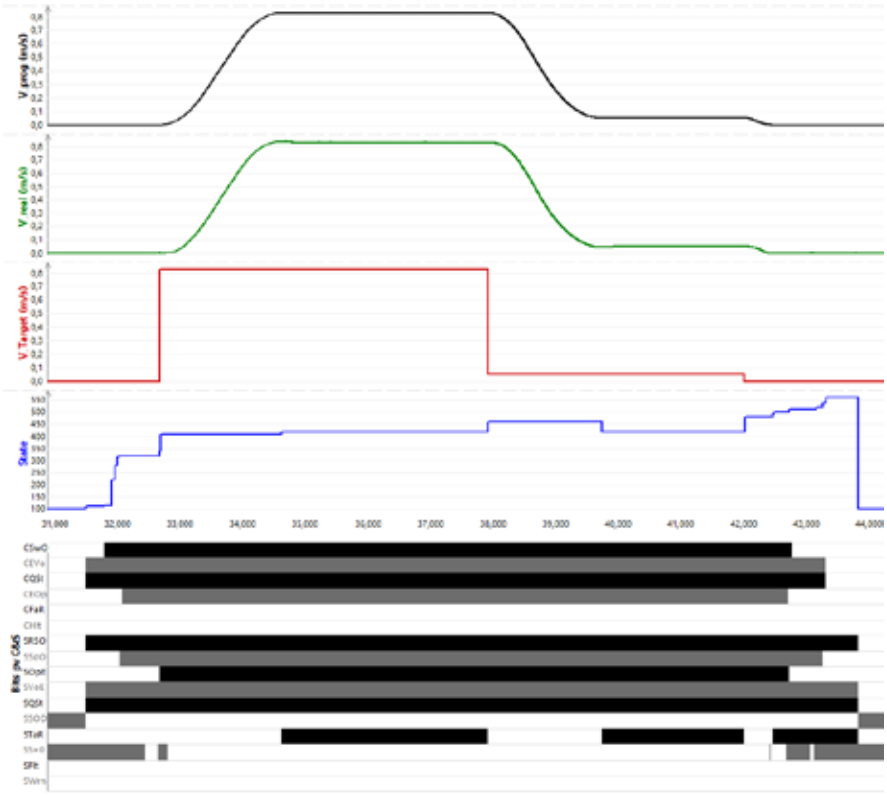
9.3.2 CANopen lift

Prerequisite:

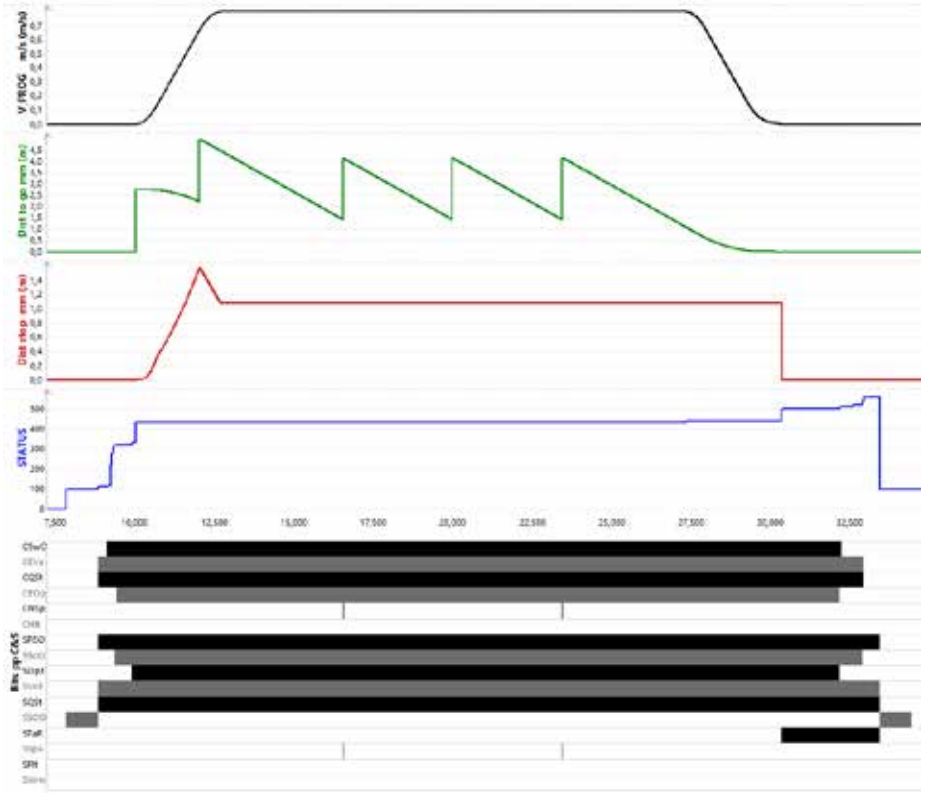
- The devices have the CiA 417 profile.
- All devices operate in 11-bit mode.
- One ZAdynpro is connected per BUS system.

Operation modes

Velocity mode pV



Position Mode pp



Command bit C or status bit S	Description	pp or pv mode	
CSwO	Switch on command	pp	pv
CEVo	Enable voltage command	pp	pv
CQSt	Quick stop command	pp	pv
CEOp	Enable operation command	pp	pv
CFaR	Fault reset command	pp	pv
CNSp	New setpoint command	pp	-
CHlt	Stop command	pp	pv
SRSO	Ready to switch on status	pp	pv
SSdO	Switched on status	pp	pv
SOpE	Operation enabled status	pp	pv
SVoE	Voltage enable status	pp	pv
SQSt	Quick stop status	pp	pv
SSOD	Switch on disables status	pp	pv
STaR	Target reached status	pp	pv
SS=0	Speed = 0 status	-	pv
SSpA	Setpoint acknowledge status	pp	-
SFlt	Fault status	pp	pv
SWrn	Warning status	pp	pv

Electrical installation, see *Controller Area Network CANopen Lift, page 24*

Procedure:

▷ Activate the interface in the **Control/CONFIG** menu.
If **CONFIG=02:ZA_CAN** is selected, further information can be found in the INFO menu pages 14 to 17, see *CANopen Lift operation, page 67*

▷ Select the respective MODE under **CAN/MODE** or configure it in the control.
If the ZAdynpro is operating in position mode, connect the shaft copy to the same bus as the ZAdynpro.

▷ Enter the maximum speed in the control.

9.4 Emergency evacuation

An emergency evacuation can be performed in the event of a power failure. During emergency evacuation, the elevator cabin is moved to a floor or the ground floor.

At the start of travel, the ZAdynpro analyses the load ratio between the cabin and counterweight and informs the control which direction of evacuation travel will save more energy. The control starts the evacuation run by applying the following signals:

- Controller enable RF
- Speed specification
- Direction specification RV1 or RV2
- Enable contactorless operation STO_A and STO_B

Emergency evacuation options

Attributes	Emergency power generator 230 VAC	UPS 230 VAC		3-phase voltage supply 3~400 VAC
		Optimum power	Minimum power	
Evacuation in motor direction	✓	✓	-	✓
Evacuation in generator direction	✓	✓	✓	✓
Load-independent start-up	✓	✓	-	✓
Load-independent engagement	✓	✓	-	✓
Flush engagement	✓	✓	-	✓

Rating of voltage supply or UPS:

Power consumption by electronics ZAdynpro or power of UPS performance on name plate

+ Control power consumption

+ Power consumption of electromechanical holding brake

+ Power consumption of other consumers, e.g. interior light

+ Power consumption of motor for evacuation with emergency generator 230 VAC or UPS

= Available power in watts

Prerequisite:

- The drive is a synchronous motor.
- Direction of travel RV1 = upwards, direction of travel RV2 = downwards.
- For emergency evacuation with 1-phase voltage supply, 230 VAC is available to the ZAdynpro for feeding into L1 and L2 of the mains connection.
- For emergency evacuation with 3-phase voltage supply, 3~400 VAC is available to the ZAdynpro for feeding into L1, L2 and L3 of the mains connection.
- The frequency inverter is a ZAdyn4C or ZAdynpro.

Emergency evacuation with emergency power generator, 230 VAC

Due to the lower voltage supply, the motor can only be operated at a lower speed.

Procedure:

1. Parametrise a digital input to **PARA2** in the **Control** menu.
   In case of a power failure, the input configured for 24 VDC is actuated in order to inform the ZAdynpro that a switchover to parameter set 2 is necessary.
2. Option: determine the evacuation direction:

Parallel control	DCP actuation	CAN actuation
▷ Parametrise a digital output to **Evac.Dir** in the **Control** menu.		
Output open: Upwards evacuation run if the cabin is lighter than the counterweight.	Command byte 2, bit 2 = low: Upwards evacuation run if the cabin is lighter than the counterweight.	Object 0x6049 = 1: Upwards evacuation run if the cabin is lighter than the counterweight.

Parallel control	DCP actuation	CAN actuation
Output closed: Downwards evacuation run if the cabin is heavier than the counterweight.	Command byte 2, bit 2 = high: Downwards evacuation run if the cabin is heavier than the counterweight.	Object 0x6049 = 2: Downwards evacuation run if the cabin is heavier than the counterweight.

3. Specify the evacuation type: Configure the **Parameter set 2/F_PARA2 = EVA. 1*AC** menu.
4. Copy the parameters: In the **Parameter set 2/COPY** menu, select the function **PARA1->2**.
   During the copying process, the maximum possible speeds for V_2 and V_3 are calculated. The parameter is OFF again after copying.
5. The power can be reduced during the evacuation: in the 2nd parameter set, reduce the speed **V_3** and the acceleration **A_POS**.

Emergency evacuation with 230 VAC UPS

Due to the low power requirements of a synchronous drive, it is possible to carry out an evacuation run at half load or in the direction of the pulling load using a commercially available UPS. An evacuation trip against the load direction is not possible.

The characteristics of the evacuation run are dependent on the available power from the UPS:

- Sufficient power: Characteristics with **optimal** power of UPS performance, see *Emergency evacuation options, page 83*
- Reduced power: Characteristics with **minimal** power of UPS performance, see *Emergency evacuation options, page 83*

Available power from the UPS:

Power of UPS performance on name plate

- Control power consumption

- Power consumption of electromechanical holding brakes

- Power consumption of other consumers, e.g. interior lighting

= **Available power of UPS performance W**

Procedure:

1. Parametrise a digital input to **PARA2** in the **Control** menu.
2. Option: determine the evacuation direction:

Parallel control	DCP actuation	CAN actuation
▷ Parametrise a digital output to **Evac.Dir** in the **Control** menu.		
Output open: Upwards evacuation run if the cabin is lighter than the counterweight.	Command byte 2, bit 2 = low: Upwards evacuation run if the cabin is lighter than the counterweight.	Object 0x6049 = 1: Upwards evacuation run if the cabin is lighter than the counterweight.
Output closed: Downwards evacuation run if the cabin is heavier than the counterweight.	Command byte 2, bit 2 = high: Downwards evacuation run if the cabin is heavier than the counterweight.	Object 0x6049 = 2: Downwards evacuation run if the cabin is heavier than the counterweight.

3. Specify the evacuation type: Configure the **Parameter set 2/PARA2 = UPS** menu.
4. Specify the stator resistance: Enter the synchronous motor's stator resistor in the **Parameter set 2/R_20** menu.

ATTENTION! Overload or destruction of the UPS if the power entered is too high

▷ Calculate the available power of UPS performance as indicated in the box.

5. Limit the motor current: Enter the available power of the UPS in the **Parameter set 2/P_UPS** menu. In the 2nd parameter set, **Start-up/T_3 = 0** and **T_4 = 0** are set automatically.
6. Copy the parameters: In the **Parameter set 2/COPY** menu, select the function **PARA1->2**. The parameter is OFF again after copying.

   Due to the lower voltage supply, the motor can only be operated at a lower speed. During the copying process, the maximum possible speeds for V_2 and V_3 are calculated.
7. The power can be reduced during the evacuation: in the 2nd parameter set, reduce the speed **V_3** and the acceleration **A_POS**.

   Due to the reduced power of UPS performance, it is not possible to decelerate the motor to standstill. The time delay until the brakes are closed can cause the door zone range to be crossed.
8. Optimise positioning:

   Parallel actuation: Configure the **Parameter set 2/STOP = ON** menu.

   DCP2 or DCP4: Determine the overshoot path of the flush position at full load and configure in the **Control/ DCP_STP = ... mm** menu. The brake is closed when the distance to the flush position specified by S_Stop is reached.

   Positioning depends on the load. When travelling at half load, the elevator can stop too early outside the door zone when **Parameter set 2/STOP = ON**.

Emergency evacuation with 3-phase voltage supply 3~400 VAC

Procedure:

1. Parametrise a digital input to **PARA2** in the **Control** menu. In case of a power failure, the input configured for 24 VDC is actuated in order to inform the ZAdynpro that a switchover to parameter set 2 is necessary.
2. Option: determine the evacuation direction:

Parallel control	DCP actuation	CAN actuation
▷ Parametrise a digital output to **Evac.Dir** in the **Control** menu.		
Output open: Upwards evacuation run if the cabin is lighter than the counterweight.	Command byte 2, bit 2 = low: Upwards evacuation run if the cabin is lighter than the counterweight.	Object 0x6049 = 1: Upwards evacuation run if the cabin is lighter than the counterweight.
Output closed: Downwards evacuation run if the cabin is heavier than the counterweight.	Command byte 2, bit 2 = high: Downwards evacuation run if the cabin is heavier than the counterweight.	Object 0x6049 = 2: Downwards evacuation run if the cabin is heavier than the counterweight.

3. Specify the evacuation type: Configure the **Parameter set 2/F_PARA2 = EVA. 3*AC** menu.
4. Copy the parameters: In the **Parameter set 2/COPY** menu, select the function **PARA1->2**. The parameter is OFF again after copying.

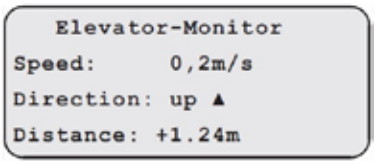
   The power can be reduced during the evacuation: in the 2nd parameter set, reduce the speed **V_3** and the acceleration **A_POS**.

Monitor function

Monitoring of the evacuation direction and speed during the evacuation process. With an activated monitor function, all further functions of the ZAdynpro are locked.

Procedure:

1. Parametrise a digital input to **41:Monitor** in the **Control** menu.
2. Switch off the ZAdynpro.
3. Activate the parametrised digital input from step 1.
4. Switch on the ZAdynpro. The monitor function is active.



Speed: Current evacuation speed

Direction: Evacuation direction

▲: Evacuation speed < Limit value V_G1

▲ ▲: Evacuation speed > Limit value V_G1

Distance: Display of the evacuation distance travelled

Stutter brake function

Uncontrolled acceleration of the elevator cabin is prevented through cyclical opening and closing of the operating brake.

If the elevator system is at a standstill or the rotary encoder is defective, the brake is opened and closed at a frequency of 0.5 Hz. As soon as movement of the elevator system is detected, the following sequence is repeated:

- If the speed of the elevator cabin exceeds the limit value V_G1, the contact of the digital output is opened and the brake is closed.
- If the limit is undershot, the contact is closed and the brake is opened.

In synchronous motors, uncontrolled acceleration can be prevented by short-circuiting the motor windings, see *Short-circuiting the motor winding for synchronous motors, page 21*

Prerequisite:

- Electrical manual released brakes

Procedure:

1. Parametrise a digital input to **Stutter br.** in the **Control** menu.
2. Entered in the **Control/V_G1** menu. Recommendation for limit value V_G1: 0.06 m/s.

Circuit suggestions for stutter brake

The following circuit suggestions are available at www.ziehl-abegg.com/service/downloads:

- Stutter brake ZAdyn4 principle circuit diagram, drawing number: ZD4C01K10
- Stutter brake ZAdyn4 + ZAsbc4 principle circuit diagram, drawing number: ZD4C01K11
- Stutter brake ZAdynpro + ZAsbc4B, drawing number: ZD4B01K2

9.5 Performing a firmware update

The ZAdynpro has a memory card in the X-MMC card slot. The memory card can be accessed from the **Memory Card** menu, see *15. Memory card, page 55*. When the memory card is accessed, the status LED of the ZAdynpro lights up blue.

ATTENTION **The firmware bootloader can be destroyed by interruptions.**

▷ DO NOT interrupt the voltage supply.
▷ DO NOT remove the memory card.

Procedure:

1. Load the current firmware from the ZIEHL-ABEGG homepage and generate the update code:
   https://www.ziehl-abegg.com/firmware.
   To get the update code, you need the serial number of the ZAdynpro and the version number of the firmware to be installed.

2. Save new firmware to a memory card, maximum capacity 32 GB, file system FAT 32.
3. Insert the memory card into the X-MMC card slot on the ZAdynpro. DO NOT use the card slot on the operating terminal. Depending on the version and size, the card slot is located on the side of ZAdynpro or under the bottom white cover.
4. In the **Memory Card/UPDATE =** menu, parametrise the *code generated* from step 1. The update is performed and takes a maximum of 1 minute. The ZAdynpro is restarted.
5. After completing the update, perform a supervised test trip.

9.6 Saving a 3rd operating language

If the memory card is inserted in the ZAdynpro ex works, all operating languages are available, see *1. LCD & password, page 35*.

If there is no memory card in the ZAdynpro or if the card supplied by ZIEHL-ABEGG is not inserted, German, English and the factory-programmed 3rd language are available. Using a memory card, another 3rd operating language can be loaded into the ZAdynpro.

Procedure:

1. Download new firmware: https://www.ziehl-abegg.com/firmware and extract to an SD memory card.
2. Insert the memory card into the X-MMC card slot on the ZAdynpro. DO NOT use the card slot on the operating terminal. Depending on the version and size, the card slot is located on the side of ZAdynpro or under the bottom white cover.
3. Configure the 3rd operating language in the **LCD & Password/LCD** menu.

9.7 Saving and loading parameters, taking measurements

The ZAdynpro has a memory card in the X-MMC card slot. The memory card can be accessed from the Memory Card menu, see *15. Memory card, page 55*. When the memory card is accessed, the status LED of the ZAdynprolights up blue.

Memory card file storage

4CX\	DEVICE\	Serial number\	LST		.PRT printer lists, text file with parameters
					.FLT error list with additional information
					.BOX Blackbox
					.FLS error list, short version, cannot be deleted
			PAR		.PA3 Parameter lists
			Rec\		Measurement
				ERR	Measurement aborted due to error
				NORM	Measurements during error-free travel
				SHOT	Measurements with the Stop&Shot function

The file name corresponds to the current number of trips.

4CX\	DEVICE\	FORCE	FORCE.PA3 file for copying parameters; created with **SAV_PAR=EIN**
4CX\	CONFIG\	Configuration number	Saving parameter configurations

UPDATE\	0_TEXT	Updates
	FORCE	Internal file update
	123456789	Firmware version
HLP_TEXT\		Help texts for error messages

Save and load parameters, lists and configurations

Via the Memory Card menu, the parameters for a **ZAdynpro** can be saved to a memory card, see *15. Memory card, page 55*.

Action	Parametrisation in the menu	File
Saving parameters	▷ **Memory Card/SAV_PAR=EIN**	Parameter list .PA3
Load parameters	▷ **Memory Card/LOD_PAR=27**	Parameter list .PA3
Save parameter lists, printer lists and error lists	▷ **Memory Card/SAV_ALL=EIN**	Parameter list .PA3 Printer list .PRT Error list .FLT Error list .FLS
Save configuration	▷ **Memory Card/SAV_CFG**	Parameter list .PA3 Printer list .PRT
Load configuration	▷ **Memory Card/LOD_CFG** The ZAdynpro performs a reset after loading.	Parameter list .PA3

If an existing configuration number is selected, the existing files will be overwritten.

Taking measurements

Measurements can be taken and stored on the ZAdynprousing a memory card.

▷ Configure measurements in the **MMC recorder** menu, see *16. MMC recorder, page 56*

9.8 Open loop operation

Operation without a rotary encoder is possible for asynchronous motors.

Attributes:

- NO distance-dependent deceleration
- Communication with the elevator control:
  - Standard: digital inputs and outputs
  - DCP1 and DCP3
  - CANopenLift velocity mode
- NO round-trip journey
- Increased heating of the motor possible
- Lower positioning accuracy and poorer travel characteristics than in closed loop operation
- Maximum travelling speed: 1.0 m/s

9.8.1 Control via Scalar Control of Induction Machine operation SCIM

SCIM stands for Scalar Control of Induction Machine and is suitable for upgrading plants with asynchronous motors where there is no encoder or there is no possibility to install an encoder.

The SCIM function in the firmware is suitable for frequency inverters from the ZAdynpro and ZAdyn4C model ranges up to a size of 32A, a maximum machine speed of 1 m/s and operation with asynchronous motors.

If gearboxes with self-locking are used, travel comfort may deteriorate. Possible improvement, see optimisations.

Prerequisite:

- The motor cable is connected directly without additional terminal points and switching contacts.
- If there is an emergency brake, it must be opened before the holding brake is opened, for example by using the RB contact.
- If the holding brakes are not monitored or are not connected to the frequency inverter, set **Start-up/T2** roughly enough so that it does not run against the brake.
- The system does NOT use the active quickstart function.

Procedure:

1. Configure in the menu **Motor name plate/n** = rated speed of the motor.
   If no clear rated speed is stamped, enter the following start values for nominal frequency and nominal speed for an asynchronous motor with 2 pole pairs:
   n = 1500 rpm
   f = 52 Hz
2. Enter the motor power factor in the **Motor name plate/cos phi** menu.
3. Parametrise the **Encoder & BC/ENC_TYPE = No ENC** menu.
4. Select the existing brake resistor in the **Encoder & BC/BC_TYP** menu.
5. In the **System data/V*** menu, parametrise the nominal speed of the system.
   If the query for automatic travel curve presetting is confirmed, the travel speeds V_2 and V_3 are automatically preset in the **Travel** menu.
6. In the **System data/MOD_n*** menu, parametrise:
   If all system data is known: **MOD_n* = Calculate** and the frequency inverter calculate the motor speed in line with **V*** using the traction sheave diameter, suspension and gearbox ratio.
   If all system data is NOT known: **MOD_n* = direct**
   Enter the rated speed of the motor **n** for **n*** and the expected machine speed for **V***.
7. In the **Control/CONFIG** menu, parametrise the digital inputs according to the control and type of communication.
   If DCP4 control or CAN position mode is used, mask **error 281** in the **Monitoring** menu.
8. Modify the motor rotation direction in the **Control/MO_DR** menu, so that the cabin moves upwards when RV1 is actuated.
9. Parametrise the **Control/C_MOD = SCIM** menu.
10. In the **Start-up** menu, check whether **T_3 = 0** and **V_T3 = 0**; if not, correct.
11. In the **Acceleration** menu, check if **A_POS ≤ V*/2**; if not, correct **A_POS**.
12. In the **Travel** menu, check whether **V_3 = V***; if not, correct **V_3**.
13. Set up in the **Decelerate/R_NEG1 = 30%** and **R_NEG2 = 80%** menu and use **A_NEG** to ensure that the deceleration path and creep path are sufficient to safely perform the first trips.
    If the deceleration path cannot be sufficiently adjusted at the upper limit with **A_NEG**, temporarily reduce **V_3** during start-up.
14. In the **Control** menu, set all parameters **SC_XX** to the default factory values, see *12. Control , page 53*.

Parameter

When control via SCIM is activated, additional parameters for optimising the handling are visible in the **Control** menu:

▷ Adjust the parameters.

Parameter	Description of the parameters	Value range	Ex works	Basic
SC_MODE	Mode	**LEVEL 1**	LEVEL 1	
SC_T_DN	Torque empty cabin down	0% .to 500%	100%	

Parameter	Description of the parameters	Value range	Ex works	Basic
SC_T_UP	Torque empty cabin up	0% .to 500%	50%	
SC_DYN	Dynamics	**Normal** **Slow** **Fast**	Normal	
SC_VADJ	Voltage adjustment	0% to 200%	100%	
SC_FIL	Filter	0 to 65535	0	
SC_IKP	Current gain factor	0.2 – 3.0	1.0	
SC_OPT1	Optimisation 1	0 to 65535	0	
SC_OPT2	Optimisation 2	0 to 65535	0	
SC_OPT3	Optimisation 3	0 to 65535	0	

Performing an initial test run

1. When starting up with the recovery control in both directions, check that the drive starts up without tripping and that it travels in the correct direction.

   If the drive moves in the wrong direction, change this in the **Control/MO_DR** menu.
2. Take several measurements to check that stator resistance measurement is working. Compare the values of the individual measurements in the **INFO menu**, see *23. INFO menu, page 60*.

   If the resistance differs by more than 5% during multiple start-ups, check the wiring, motor connection, and motor windings.
3. Check that the load detection is working: In the **INFO menu SCIM 51**, **UP REG** must appear in the 2nd line when the brake opens when travelling UP and **DN MOT** must appear when travelling DOWN, see *23. INFO menu, page 60*.

   If ZERO is displayed in both directions of travel, there is a gearbox with high self-locking, see *Setting up normal operation with an empty cabin, page 90* Optimisations.

Setting up normal operation with an empty cabin

Initial start-up through manual measurement of the actual speed

1. Perform several normal trips at high speed V_3 in both directions. Check the parametrization if a trip is terminated with an error.
2. Manually measure the actual speed with a hand-held tachometer in the DOWN direction. Adjust the nominal frequency in the **Motor name plate/f** menu according to the following formula:

   With 2 pole pairs: f[Hz] n[RPM]

$$f = f_alt + \frac{(n_target - n_actual)}{30}$$

   General P = Number of pole pairs

$$f = f_alt + \frac{(n_target - n_actual)}{60} \times p$$

3. Perform a test trip DOWN. The speed deviation must be smaller with the adjusted nominal frequency. If the correction was above +/-0.5 Hz, repeat the adjustment with the newly determined value.
4. Manually measure the actual speed several times with a hand-held tachometer in the UP direction. The speed deviation must be within the range of the measurement of an empty cabin travelling DOWN.

Exception: Start-up through observing the creep path

Prerequisite:

- Motor data n, f, I, U, P and cos phi are available, see *Parametrisation, page 34*.
- The creep paths, see **INFO menu SCIM 51**, line 4 right *23. INFO menu, page 60*, exhibit a significant deviation when travelling in the DOWN direction compared to travelling in the UP direction.

Procedure:

1. Make sure that the creep path is sufficient when driving at high speed V_3.
2. Perform several normal trips in both directions. Check the parametrization if a trip is terminated with an error.
3. If the creep path shown in the DOWN direction is greater than in the UP direction, increase the rated motor frequency in increments of 0.2 Hz in the **Motor name plate/f** menu.
   Repeat the trips and check the creep paths. Keep repeating the procedure until the deviation is acceptable.
4. If the creep path shown in the DOWN direction is smaller than in the UP direction, decrease the rated motor frequency in increments of 0.2 Hz in the **Motor nameplate/f** menu.
   Repeat the trips and check the creep paths. Keep repeating the procedure until the deviation is acceptable.

Optimisations

Optimise start-up torques if necessary:

- Adjustment of the start-up behaviour in the DOWN direction of travel with regard to turning back or vibrations: Parameter **SC_T_DN**
- Adjustment of the start-up behaviour in the UP direction of travel with regard to turning back or vibrations: Parameter **SC_T_UP**
- If a gearbox with self-locking is present, set the two parameters **SC_T_DN** and **SC_T_UP** to **0**.

Optimise the run-in process if necessary:

- Adjust the creep speed to the optimum setting, 5 to 8 cm, and perform the adjustment when the motor is cold. To adjust the creep speed, see the *frequency inverter instructions.*
- If the stop process is cancelled with an overcurrent or overload error message, increase **Stop/ V_STOP** in the menu. The parameter corresponds to the minimum travelling speed when stopping and the brake is closed when V_STOP is reached.
- If vibrations occur when driving at creep speed,
  - increase the creep speed and/or
  - activate the noise filter at creep speed in the **Control/SC_FIL = 64** menu
  - Change the parameter **SC_VADJ** 70% - 130%

9.8.2 Control via voltage and frequency control U/f

Procedure:

1. Select **Startup/USR_LEV=Advanced** in the menu.
2. Enter the parameters in the **Motor name plate** menu, see *2. Motor name plate, page 36*.
   Check the calculated value n for plausibility:
   1. Calculation of the speed n_{syn} of the magnetic field in the motor winding:
      $n_{syn} = f \times 60 / p$
   2. Compare the nominal speed n with the speed n_{syn}:
      Depending on the pole pairs, the following difference must result between n_{syn} and n, see **Motor name plate/p** menu

Number of pole pairs p	Difference n_{syn} - n rpm
2	80 - 120
3	50 - 80

   If the calculated difference is outside of the specified range, calculate the nominal speed n using the following formula and enter it in the **Motor name plate** menu:

Number of pole pairs p	Nominal speed calculation n
2	$n=n_{syn}$ - 100
3	$n=n_{syn}$ - 65

3. Activate the open loop operating mode in the **Encoder & BC/ENC_TYPE = No ENC** menu.
4. Enter the parameters in the **System data** menu, see *4. System data, page 38*.
   Check the value n* for plausibility:
   The value determined for n* must be lower than or equal to the nominal speed n in the **Motor name plate** menu. If n* > n, decrease the parameter in the **System data/ V*** menu until n* ≤ n.
5. CANopen Lift operation: Parametrise the **Travel/V_3** = V* menu.
6. Parametrise the **Decelerate/S_ABH = Off** menu.
7. Check the weight balance.
8. Carry out one upward and one downward trip at reduced speed, at least 30% of the rated speed of the system, e.g. with the recovery control. If the motor does not rotate and the travel is interrupted, see *Troubleshooting for control via voltage and frequency U/f, page 95*.
9. Carry out one upward and one downward trip at the rated speed of the system. If travel is interrupted, see *Troubleshooting for control via voltage and frequency U/f, page 95*.

Parameter

When control via voltage and frequency U/f is activated, additional parameters for optimising the handling are visible in the **Control** menu.

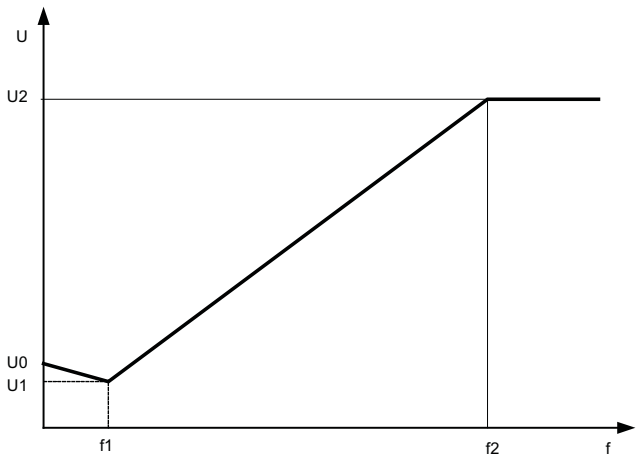
▷ Modify parameters: **Control/UF_ED=Manual**

Parameter	Description of the parameters	Value range	Ex works
UF_ED	U/f edit mode, enabling of additional parameters in encoderless operation	Auto Manual	Auto
V_0	Minimum travelling speed at start; setpoint for V_0 is output before brake opens	0 ... 0.2 m/s	automatic
V_STOP	Minimum travelling speed at stop; brake is closed when V_STOP is reached	0 ... 0.2 m/s	automatic
I_KIPP	Anti-tip protection: From the set limit value, the speed setpoint is reduced.	0 ... 90 A	automatic
U0	Voltage of the frequency-dependent voltage characteristic curve at frequency 0	0 ... 460 V	automatic
U1	Start voltage for frequency-dependent voltage characteristic	0 ... 460 V	automatic
U2	Edge voltage for frequency-dependent voltage characteristic	0 ... 460 V	automatic
f1	Start frequency for frequency-dependent voltage characteristic	0 ... 125 Hz	automatic
f2	Edge frequency for frequency-dependent voltage characteristic	0 ... 125 Hz	automatic
s_FIL	Filter motor current detection for slip compensation	0 ... 400 ms	automatic
s_COMP	Slip compensation operation	On Off	On
s_LIM	Maximum slip frequency compensation		automatic
U_S_MX	Maximum output voltage for slip compensation	0 ... 300 V	80
I_IxR	Current controller; minimum current specifications for motor	0 ... 90 A	Motor nominal current I
I_FIL	Filter motor current for slip compensation	0 ... 125 Hz	automatic
IxR_KP	P-component controller for current injection	0 ... 10 V/A	automatic
IxR_TI	I-component controller for current injection	5 ... 1000 ms	20 ms
IxR_KC	Correction factor controller for current injection	0 ... 127	0.2

Parameter	Description of the parameters	Value range	Ex works
IxR_KD	D-component controller for current injection	0 ... 3.0	0.0
IxR_MX	Maximum controller limit	0 ... 100%	20
IxR_MN	Minimum controller limit	0 ... 100%	0
FADE1	Show and hide current injection and slip compensation, dependent on the field of rotation frequency in the stator	0 ... 125 Hz	automatic
FADE2	Show and hide current injection and slip compensation, dependent on the field of rotation frequency in the stator	0 ... 125 Hz	automatic

Functions

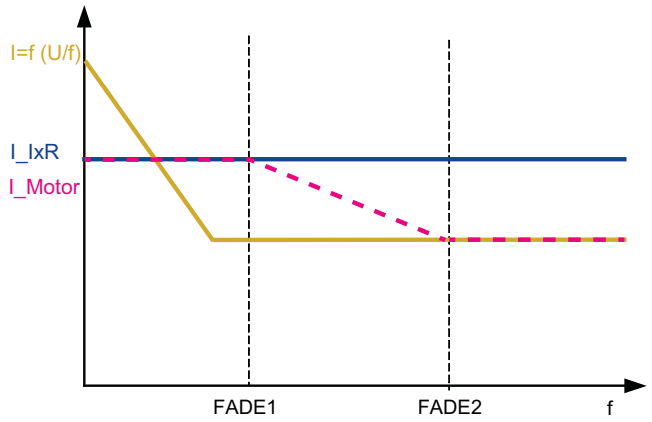
Parameters U0, U1, U2, f1 and f2 are preset with the motor data in the motor name plate menu and the U/f characteristic curve is defined, which specifies the motor voltage depending on the frequency of the field of rotation in the stator.



Current injection

To optimise start-up, stopping and travel at low speeds, the motor is energised with a minimum current **Control/I_IxR**. With the parameters **FADE1** and **FADE2**, the current supply is specified depending on the frequency f of the field of rotation in the stator.

Condition	Action
f < FADE1	The motor is energised with 100% I_IxR.
f > FADE2	I_IxR=0
FADE1 < f < FADE2	Current injection is active depending on the characteristic curve: the higher the frequency, the lower the current injection.



▷ If necessary, adjust the parameters.

Slip compensation

In asynchronous motors, the difference between synchronous speed and asynchronous speed is proportional to the load on the motor, i.e. proportional to the amount of motor current. This results in different upward and downward speeds with the same load.

Example:

For a motor with a rated speed of 1430 rpm, the speed in the downward direction is 1430 rpm when the cabin is empty. In the upward direction, the speed is 1570 rpm. This speed difference of 140 rpm is compensated by slip compensation.

▷ Activate slip compensation: **Control / s_COMP=On**
The motor current is recorded by a filter **s_FIL**. Proportional to the measured current, the slip frequency is added to or subtracted from the output frequency of the U/f characteristic curve or voltage is added to the output voltage of the U/f characteristic curve.

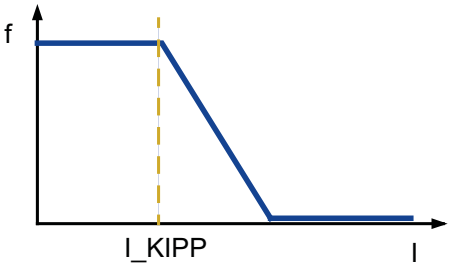
▷ Limit additional values for slip compensation:
Frequency: **Control/s_LIM**
Voltage: **Control/U_S_MX**

▷ Specify the slip compensation depending on the parameters **FADE1** and **FADE2**:
f < FADE1: Frequency field of rotation in the stator < FADE1, slip compensation = off
f > FADE2: Frequency field of rotation in the stator > FADE2, slip compensation = 100%
FADE1 < f < FADE2: The higher the frequency, the higher the slip compensation.

Protection against uncontrolled drop in speed

If the limit value set for the current **I_KIPP** is reached, the specified target value for the speed is reduced in line with the motor current.

▷ Set the limit value for the current I_KIPP: **Control/I_KIPP**



9.8.2.1 Troubleshooting for control via voltage and frequency U/f

Problem	Cause	Remedy
Motor does not rotate and travel is aborted	▫ Trip is cancelled with error message 410 ADC:Overcurrent 480MP: Overcurrent ▫ Travel interrupted by control	▷ Parametrise the **Control/UF_ED = Manual** menu. ▷ In the **Control/I_IxR** menu, increase the parameter in steps of 10% until the motor rotates. Do not exceed the maximum value of 1.5 x nominal motor current.
No stopping accuracy despite correctly set switch-off points	The cabin travels too slowly during motor travel or stops before the stop.	▷ In the **Motor name plate/I** menu, decrease the parameter in increments of 10%.
	The cabin travels too quickly during motor travel or travels past the stop.	▷ In the **Motor name plate/I** menu, increase the parameter in increments of 10%.
	The system does not stop in a flush position depending on the load.	▷ In the **INFO menu page 03: Check Dist.** with the s1 display whether a positioning run is performed at speed V_1. ▫ Trip with V_1 and system stops before stop: In the **Travel/V_1** menu, increase the parameter in increments of 10%. ▫ Trip NOT at V_1, check switch-off points.
Error message during acceleration	Aborting the acceleration with error: 410 ADC:Overcurrent 480 MP:Overcurrent	▷ In the **Acceleration/R_POS1** menu, increase or decrease **A_POS**.
Error message during delay	Delay aborted with error: 410 ADC:Overcurrent 480 MP:Overcurrent	▷ In the **Decelerate/R_NEG1** menu, increase or decrease **A_NEG**.

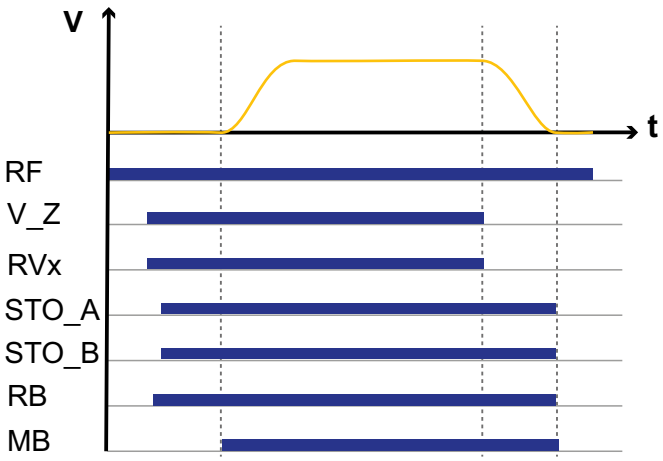
Optimisation options

Problem	Cause	Remedy
The motor rotates backwards when starting up.	The minimum current imprinted on the motor is too low.	▷ Optimise the start-up behaviour: Increase **Control/ I_IxR**
The motor does not rotate when starting up.		
An overcurrent occurs during start-up immediately after opening the mechanical brake.		
Positioning runs of different lengths	Different speeds during upward and downward travel	▷ Adjust slip compensation: **Control/s_COMP=On**
Inaccuracies when stopping		

9.9 Activating readjustment

Correction of the elongation of the suspension means when loading and unloading the cabin. The cable extension is evaluated by the control. The travelling speed for readjustment has priority over other travelling speeds.

Readjustment



Input signals	
RF	*Controller enable*
V_Z	*Readjusting the speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

Prerequisite:

At least the following input signals are applied:

- Controller enable
- Readjustment speed V_Z
- Direction specification

Procedure:

1. Parametrise a digital input to V_Z.
2. Parametrise the readjustment speed in the **Travel/V_Z** menu and actuate the digital input set to V_Z.

9.10 Activating the quickstart

The Quickstart function may only be used in the door zone range in elevator systems with readjustment.

While the cabin door is closing, the motor is energised and the mechanical brake is opened. The motor speed is adjusted to 0. Travel begins immediately after the doors are closed.

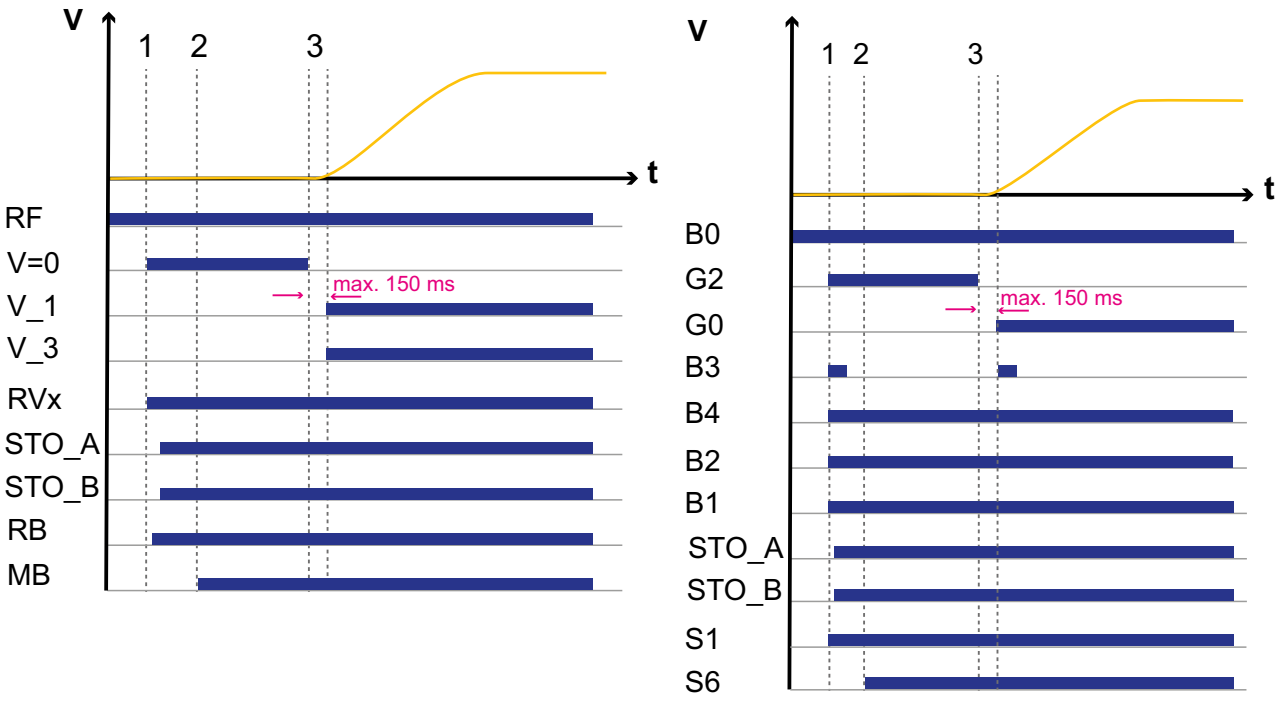
▷ Observe the regulations in EN 81-20.

Actuation

No.	Process	Parallel control	DCP	CANopen Lift
1	Cabin door is closing	Actuation of inputs: ▫ RF - Controller enable ▫ RVx - Specified travel direction ▫ v = 0 Hold speed at 0	Setting the bits with the elevator control: ▫ G2 - Speed 0 ▫ B1 - Travel command ▫ B2 - Off switch ▫ B3 - Travelling speed ▫ B4 - Direction of travel	Travel sequence via control word from the control according to CiA specification 417, travel command: ▫ Enable voltage ▫ Disable operation ▫ Target speed v = 0
		Activation of output: ▫ RB - Controller ready The STO function inputs must be activated immediately or the motor contactors must be energized. The motor is energised.	Setting the bits with the frequency inverter: ▫ S1 - Travel active The STO function inputs must be activated immediately or the motor contactors must be energized. The motor is energised.	The STO function inputs must be activated immediately or the motor contactors must be energized. The motor is energised.
2		Activation of output: ▫ MB - Mechanical brake Open motor brake immediately. The motor speed is adjusted to 0.	Setting the bits with the frequency inverter: ▫ S6 - Mechanical brake Open motor brake immediately. The motor speed is adjusted to 0.	Control opens brake with Enable operation. Open motor brake immediately. The motor speed is adjusted to 0.
3	Cabin door is closed	Deactivation of input: ▫ v=0 Hold speed at 0 Actuation of inputs: ▫ V1 positioning speed or ▫ V2 - intermediate speed or ▫ V3 - travelling speed Actuate travelling speeds max. 150 ms after input v=0 has been deactivated.	Setting the bits with the elevator control: ▫ G6 - intermediate speed or ▫ G7 - fast speed ▫ B3 travelling speed Cancelling the bit with the elevator control: ▫ G2 - Speed 0 Actuate travelling speeds max. 150 ms after input v=0 has been deactivated.	Brake is monitored by the control: Brake must be open • The target speed is set by the control. Actuate travelling speeds max. 150 ms after input v=0 has been deactivated.

Quickstart with standard actuation

Quickstart with DCP actuation



Input signals		B0	*Inverter enable*
RF	*Controller enable*	*G2*	*Speed 0*
v=0	*Hold speed at 0*	*G0*	*Creep speed*
V1	*Positioning speed*	*B3*	*Travelling speed*
V3	*Travelling speed*	*B4*	*Direction specification*
RVx	*Direction specification*	*B2*	*Off switch*
STO_A	*Enable contactorless operation*	*B1*	*Travel command*
STO_B	*Enable contactorless operation*	*STO_A*	*Enable contactorless operation*
Output signals		*STO_B*	*Enable contactorless operation*
RB	*Controller ready*	*S1*	*Travel active*
MB	*Mechanical brake*	*S6*	*Mechanical brake*

Procedure:

1. Parametrise a digital input to **v=0** in the **Control** menu.
2. Switch off the **Hold speed 0** function.
3. Apply the signals for travelling speeds.

Monitoring function

Error message	Cause	Remedy
ERR780/Quickstart > 20s	Drive held at speed 0 for more than 20 seconds	▷ Set the quickstart time to a maximum of 20 seconds in the elevator control.
ERR781/Quick. during travel	Input signal **Hold speed at 0** set during travel.	Error during actuation. ▷ Consult the manufacturer of the elevator control system.
ERR529 / Quickstart Alarm	Motor moves by more than ±7 mm when input speed 0 is set	▷ Optimise the speed controller setting, see *Performing normal travel, page 110*, step 2.

9.11 Calibrating the rotary encoder for synchronous motors

Motors from ZIEHL-ABEGG are adjusted to the offset value 0 ex works, so no calibration is necessary.

Rotary encoder calibration must be carried out when replacing a rotary encoder or using motors not from ZIEHL-ABEGG.

9.11.1 Load-free calibration of SSI encoder

While the SSI rotary encoder is being calibrated, the ZAdynpro energises the motor with direct current. In the process, the rotor rotates to the centre of the nearest magnetic pole. In this rotor position, the SSI encoder must be manually calibrated to its zero point.

Prerequisite:

- The creation date and motor data are parametrized.
- Load-free operation and suspension means have been removed from the traction sheave.
- Brake monitoring must be activated in the Monitoring/BR menu in accordance with the number of brakes in use.
- The ZAdynpro is switched off.

Procedure:

1. Connect the SSI encoder to the ZAdynpro.
2. Switch on the ZAdynpro.
3. In the **Encoder calibration/ENC_OFF** menu, set the parameters to the offset value 0.
4. Mount the SSI encoder so that the clamping screw is easily accessible.
5. Configure the parameter in the **Encoder-Calibration/ENC_ADJ = Loadfree** menu.
6. Answer the queries regarding the load-free state.
   If an SD card is inserted in the ZAdynpro, the calibration data is stored on the card.
7. Keep the inspection run button held down throughout. The rotor aligns itself.
8. Adjust the rotary encoder as close as possible to 0° by turning it, the deviation must be < 2°. Fasten the clamping screw carefully, correcting the encoder position if necessary.
9. Screw on the rotary encoder tightly and confirm with the Enter key. The ZAdynpro checks whether the deviation is no more than 2°.
10. When the **Stop Inspection** message appears, release the inspection run button.
11. Optionally, save the result of the calibration to the SD card in the ZAdynpro. Storage location: **/4CX/DEVICE/Serial number/LST/Travel number.POL**
    Configure the parameter in the **Encoder-Calibration/ENC_ADJ = Check** menu.
    Keep the inspection run button held down throughout. The check of the offset value takes approx. 2 minutes. The rotor rotates 360° and the offset value is determined at each pole.
    Release the button for the inspection run.

9.11.2 Load-free calibration of EnDat encoder

While the EnDat rotary encoder is being calibrated, the ZAdynpro energises the motor with direct current. In the process, the rotor rotates to the centre of the nearest magnetic pole. In this rotor position, the offset value is saved to the EnDat encoder and the EnDat encoder is set to position 0.

Prerequisite:

- The creation date and motor data are parametrized.
- Load-free operation and suspension means have been removed from the traction sheave.
- Brake monitoring must be activated in the Monitoring/BR menu in accordance with the number of brakes in use.

Procedure:

1. Activate **Encoder-Calibration/ENC_ADJ = Loadfree** in the menu.
2. Respond to the query regarding the load-free state.

If an SD card is inserted in the frequency inverter, the calibration data is stored on the card.

3. Press the inspection run button and keep it held down throughout. The rotary encoder is calibrated. During the calibration, the traction sheave must turn to the right, when looking at the traction sheave.
4. When the **Stop Inspection** message appears, release the inspection run button.
5. Optionally, save the result of the calibration to the SD card in the frequency inverter. Storage location: **/4CX/DEVICE/Serial number/LST/Travel number.POL**

   Configure the parameter in the **Encoder-Calibration/ENC_ADJ = Check** menu.

   Keep the inspection run button held down throughout. The check of the offset value takes approx. 2 minutes. The rotor rotates 360° and the offset value is determined at each pole.

   Release the button for the inspection run.

9.11.3 Calibrating the rotary encoder with the brake closed or type ERN1387

Prerequisite:

- The creation date and motor data are parametrized.
- The brake is closed and does not open during calibration.

Procedure:

1. Remove the electrical connection of the brake for the duration of the rotary encoder calibration.
2. Activate **Encoder-Calibration/ENC_ADJ = Braked** in the menu.

   If an SD card is inserted in the ZAdynpro, the calibration data is stored on the card.
3. Respond to the query as to whether the electrical connection for the brake is disconnected.
4. Press the inspection run button and keep it held down throughout. The motor may make loud noises for approx. 10-15 s. These noises are caused by the special current supply to the motor and are normal for this kind of rotary encoder calibration. Rotary encoder calibration is performed: Line 3 shows the current motor current. The ZAdynpro checks whether a valid offset value has been determined.
5. When the **Stop Inspection** message appears, release the inspection run button.
6. To end the encoder calibration, save the determined value. This is saved in the **Encoder calibration** menu under the **ENC_OFF** parameter.

   If no error message is displayed on the operating terminal, the calibration has been completed successfully.

9.12 Swapping parameters between frequency inverter and absolute encoder

The electronic name plate function allows parameters from the ZAdynpro to be stored in an absolute encoder with EnDat interface or BiSS C interface or loaded into a frequency inverter from an absolute encoder.

Backing up data

▷ Configure the parameter in the **Encoder-Calibration/SAV_P_E = On** menu.

Loading data

▷ Configure the parameter in the **Encoder-Calibration/LOD_P_E = 27** menu.

9.13 Automatically determining the operating data for asynchronous motors

If motor data is not available for asynchronous motors, the Autotune function can be used to find the optimal operating data for the motor.

Prerequisite:

- Motor temperature is < 40°C
- The rotary encoder and the motor are connected with the correct phases.

Procedure:

1. Move the empty cabin to the middle of the shaft.
2. Enter the following parameters in the **System data** menu:
   V* = 90 % of the rated system speed
   MOD_n* = Calculate
   n* = calculated automatically
   _D = traction sheave diameter
   _iS = suspension
   _i1 = i1 of the gearbox ratio i1:i2
   _i2 = i2 of the gearbox ratio i1:i2
3. Enter the rated system speed in the **Travel/V_3=V*** menu or parametrise in the control during CANopen Lift operation.
4. Calculation of parameter **f**:
   4.1. Calculation of the number of pole pairs using the data on the name plate:
   p = $f_{\text{Name plate}}$ x 60/$n_{\text{Name plate}}$
   4.2. Calculation of the corrected nominal frequency using the data from step 2 and 4.1., using the integer portion of p: f = **n*** x **p**/60
   4.3. Add 1.5 Hz: **f** = f + 1.5 Hz
5. Enter the value calculated in 4.3. in the **Motor name plate/f** menu.
6. Enter the following parameters in the **Motor name plate** menu:
   n = n* calculated rated system speed n* from step 2
   I = see motor name plate, no specification: I = Power kW x 2
   cos phi = see motor name plate, no specification: cos phi= 0.88
7. Move the empty cabin **down** at inspection speed.
   If the drive does not start or the travel is interrupted with an error message, increase the nominal frequency in steps of 1 Hz in the **Motor name plate/f** menu until the elevator starts to move downwards.
8. Move the empty cabin to the top stop.
9. Parametrise setting in the **Motor name plate/ASM_ID = On** menu. The display changes to the INFO menu ASM_ID page 22.
10. Go to the bottom floor with a travel command.
11. One of the following displays appears at the end of travel:
    a) **Good, factor x.x.** The operating data could be determined correctly.
    x.x indicates the correction factor by which the original values were corrected, e.g. 1.2. The data is saved when the Enter key is pressed. The process is finished.
    If there are still voltage reserves, steps 1 to 8 can be carried out again - without step 3. Set the rated speed V* to 95% for the 2nd time. If successful, a 3rd try can be attempted at 100% of the rated speed. At 95% or 100% of the rated speed, U_TRIM must not be changed.
    b) **U:LIMIT** at 90% of the rated system speed. The voltage limit of the ZAdynpro was reached too early.
    Set a lower value in the **Motor-name plate/U_TRIM** menu. The parameter is only visible if parameter **Motor name plate/ASM_ID = ON**. Complete steps 1-10 again.
    c) **f:LIMIT** at 90% of the rated system speed. The slip limit has been reached.
    Parametrise setting in the **Motor name plate/f_SLIP=15 Hz** menu. The parameter is only visible if parameter **Motor name plate/ASM_ID = ON**. Complete steps 1-10 again.

9.14 Modifying the clock frequency

Only modify the clock frequency after consulting the ZIEHL-ABEGG service hotline.

Factory setting for clock frequency

Model range	Size	Synchronous motor	Asynchronous motor
ZAdyn4C ZAdynpro	011 013 017 023 032	16 kHz Auto **M_PWM=Auto**	16 kHz Auto **M_PWM=Auto**
	040 050 062 074	8 kHz fixed **M_PWM=Fix f_PWM**	16 kHz Auto **M_PWM=Auto**
ZAdyn4B	110 180	7.4 kHz Auto **M_PWM=Auto**	7.4 kHz Auto **M_PWM=Auto**

If the output frequency is less than 7 Hz, the clock frequency of the ZAdyn4C and ZAdynpro is reduced to 8 kHz.

ATTENTION! A higher clock frequency causes a performance reduction of the ZAdynpro and increased heating.

▷ Steplessly adjust the clock frequency in the **Power unit** menu:

Size	Switching frequency
011 - 074	3.7 to 16 kHz
110 - 180	3.7 to 8 kHz

Specify fixed clock frequency in the menu **Power unit/M_PWM = Fixed f_PWM**. The ZAdynpro works with the clock frequency configured in the **Power unit/f_PWM** menu.

Adjust clock frequency automatically in the **Power unit/M_PWM = Auto** menu. The ZAdynpro works with the clock frequency configured in the **Power unit/f_PWM_H** menu. If required, the ZAdynpro switches to the clock frequency configured in the **Power unit/f_PWM** menu.

9.15 Performing a capture release

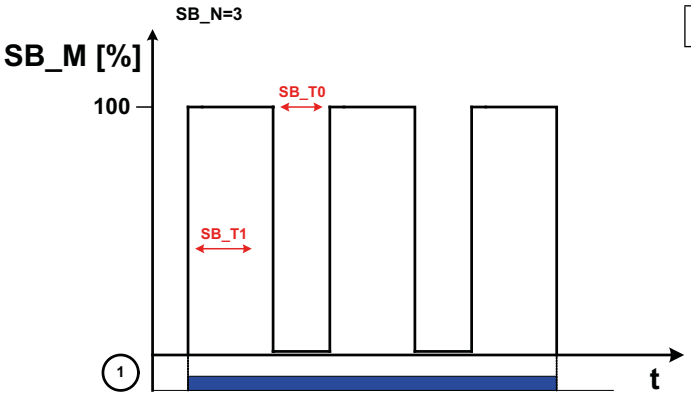
Depending on the parametrised values, the motor builds up a maximum torque and attempts to pull the cabin out of the catch.

Prerequisite: The maximum temperature of the power unit is 40 °C, see *23. INFO menu, page 60* Power 1, page 12.

ATTENTION **Material damage due to possible overloading of the power unit on the ZAdynpro**

▷ Maximum 2 repetitions of the capture release process per use case.
▷ Wait at least 2 minutes between the 2 attempts.

Capture release process



1	Recovery trip UP or DOWN

Procedure:

1. Configure the parameter in the **Safety catch/SPD_MOD = On** menu.
2. Push the button for the recovery trip. Capture release starts.
3. Result of the capture release:
   Stop inspection: Unsuccessful
   Time and current display: successful
4. Abort inspection run.
5. In case of successful capture release: **SB_INFO 1**

9.16 Performing a reset

The ZAdynpro is reset to the default values or customer-specific system data.

Reset no.	Effect
77	**Pre-parametrised ZAdynpro:** Parameters are assigned customer-specific system data **Standard ZAdynpro:** Parameters are assigned standard values
90	Restart ZAdynpro without affecting the parameters
99	Deleting all the fault memory, parameters and presettings according to hardware

Procedure:

1. Synchronous motors: note the value for the encoder offset 77 or 99 in the **Encoder calibration/ENC_OFF** menu, as the value is set to 0 during the reset.
2. Enter the respective reset no. in the **Statistics/RESET** menu.
3. Synchronous motors: enter the encoder offset value noted in step 1 or calibrate the rotary encoder, see *Calibrating the rotary encoder for synchronous motors, page 99*.
4. If a reset 99 has been carried out, enter the parameters in the menus **Motor name plate**, **Encoder & BC**, **System data**, **Control** and **Monitoring**, see *Putting ZAdynpro into operation for the first time, page 108*.

9.17 Checking the motor phase

During the starting procedure, the motor phases can be checked to prevent undefined motor movements, for example due to wiring errors, fractured wires or short circuits. Before opening the brake, a test voltage is applied to the U/V/W phases and the current is measured in the 3 motor phases. The start procedure is extended by approx. 300 ms.

Procedure:

1. Parametrise the type of test in the **ZA-Internal/UVW_CHK** menu, see *22. ZA Intern, page 60*.
2. Parametrise the test voltage in the **ZA-Internal/UVW_PEK** menu.

3. If an error is detected during the test or the test voltage is too low, the error message **E412 - MOT:UVW missing** appears. Increase the test voltage manually.

9.18 Operating ZAdynpro with a 3-phase 230 VAC voltage supply

Procedure:

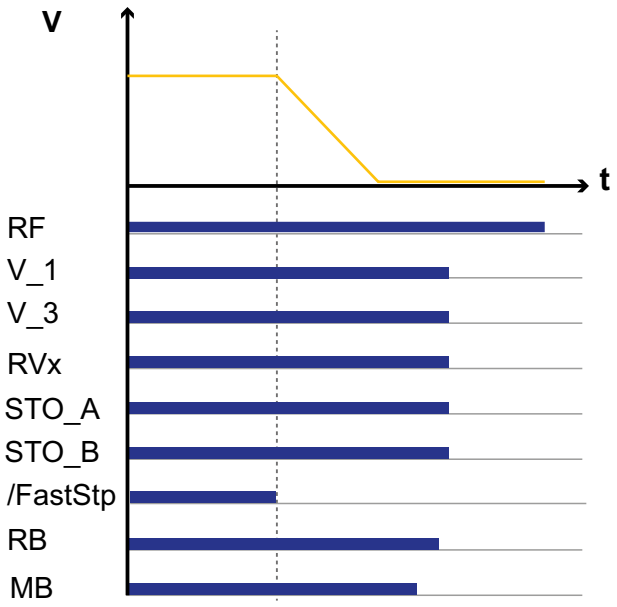
Adapt monitoring functions to the lower voltage supply:

1. In the menu, parametrise **Power unit/UDC_N = 325 V**.
2. In the menu, parametrise **Power unit/UDC_MIN = 250 V**.
3. In the menu, parametrise **Power unit/UDC_MAX = 760 V**.
4. In the menu, parametrise **Power unit/U_BC = 650 V**.

9.19 Activating controlled emergency stop for inclined elevators

⚠ CAUTION **Risk of injury due to jerky stopping in the event of an emergency stop due to the brakes closing suddenly.**

▷ In case of emergency stop, decelerate the car in a controlled manner before the brakes are closed.



Input signals	
RF	*Controller enable*
V1	*Positioning speed*
V3	*High travelling speed*
RV1x	*Direction specification*
/FastStp	*Deceleration during emergency stop*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

▷ Deactivate the input with the **/FastStp** function. The motor is decelerated with the timing parametrised in the **Control/A_MAX** menu.

9.20 Using the direction change counter

Reverse counter, which counts the permitted number of travel direction changes and informs the operator of the elevator system in good time when the suspension means need to be replaced.

▷ If the ZAdynpro is replaced, accept the current counting value from the reverse counter TD_CNT in the new ZAdynpro. If absolute encoders are used, the current counting values can also be transferred from the encoder to the new frequency inverter, see *Loading the counter reading from the absolute encoder into the ZAdynpro, page 105*.

The **INFO menu** on **page 21 TravelDirection** shows the current counter readings and the start value of the travel direction change counter, see *23. INFO menu, page 60*. If the travel direction change counter is not used, it says: not used.

The **Statistics** menu contains the parameter TD_... for setting up the travel direction change counter, see *14. Statistics, page 54*.

▷ To use all parameters TD_..., assign a password in the **Statistics/TD_PWN** menu, see *Assigning or modifying a password, page 105*.

Approx. 1 year before reaching the maximum permissible number of travel direction changes, error message **370 Suspension means warning** is output. The ST output drops for 2 seconds or more and is then energised again.

If the maximum number of allowed travel direction changes is reached, the error message **950 TD_CNT: Limit** is output. The ST output drops out and remains off. One trip is possible each time the frequency inverter is restarted.

Assigning or modifying a password

Changes to the travel direction change counter can only be made after a password has been assigned.

▷ In the **Statistics/TD_PWN** menu, assign a password between 1 and 9999.

If a password has already been assigned and you want to modify this, enter the current password in **Statistics/TD_PW** first.

If no password has been assigned, the parameter **TD_PWC** has the value 56370.

Starting or resetting the travel direction change counter

On initial activation and after changing the suspension means, the travel direction change counter must be set to the maximum permissible number of travel direction changes for the suspension means.

The number of counter resets **TD_RES** is set to 1 upon start-up and increased by 1 each time the counter is reset. The current value of TD_RES can be displayed in the **INFO menu** on **page 21 TravelDirection** by pushing the Enter key.

Procedure:

1. Enter the previously assigned password in the **Statistics/TD_PW** menu.
2. In the **Statistics/TD_SET** menu, enter the maximum number of travel direction changes for the suspension means. The maximum number of travel direction changes for the Statistics/TD_SET parameter is 16.77 million.

Deactivating the travel direction change counter

The travel direction change counter can be stopped and the password reset.

The parameter **not used** is displayed in the **INFO menu** on **page 21 TravelDirection**.

Procedure:

1. Enter the previously assigned password in the **Statistics/TD_PW** menu.
2. Enter **Statistics/TD_SET = 0** in the menu.
3. Enter the password again in the **Statistics/TD_PW** menu.
4. Enter **Statistics/TD_PWN = 0** in the menu.

Loading the counter reading from the absolute encoder into the ZAdynpro

The counting value of the travel direction change counter is automatically saved in the absolute encoder. The function is possible in absolute encoders with EnDat, Hiperface and BiSS C interfaces.

Procedure:

1. In the **Statistics/TD_PW** menu, enter the current password
2. Configure the parameter in the **Statistics/TD_RST = ON** menu. The counter is restored and can be viewed in the parameter **TD_CNT** in the **Info menu** on **page 21 TravelDirection**.

Assigning output functions for the travel direction change counter

The digital outputs of the ZAdynpro can be assigned with 2 functions for the travel direction change counter, see *Parameter description of the digital outputs, page 45*:

Parameter	Description of the parameters
Suspension means	Replacement of suspension means required If the current suspension means can still be used for approx. 1 year, the contact closes. The contact remains closed until the suspension means is replaced and the reverse counter is reset.
TD_CNT ext.	Monoflop When the direction of travel is changed, the output relay emits a pulse at the respective output. Suitable for connection of an external counter, e.g. in the control system. The output function is active even if the direction change counter is not activated.

▷ Parametrise a digital output to the required parameter.

9.21 Self-monitoring of brakes according to EN 81-20

The operating brakes can be used as braking elements to protect the car against unintended movement and to protecting the ascending car against overspeeding. The microswitches or inductive proximity switches on the brakes are used for the required self-monitoring. Monitoring can be performed with normally closed contacts NC or with normally open contacts NO.

Activating self-monitoring

▷ In the **Monitoring/BR** menu, select the number of brake circuits and the function of the monitoring contacts, see *6. Monitoring, page 48*.

Lock ZAdynpro in the event of a faulty brake circuit

If a faulty brake circuit is detected, the ZAdynpro must lock itself.

▷ Activate **Monitoring/LOCK_X=On** in the menu.

Release the lock: **Monitoring/UNLOCK_X=On** menu

Checking the functionality of the self-monitoring

The self-monitoring test required by EN 81-50, 5.8.3.2.5 is performed for every software version during the internal firmware test at ZIEHL-ABEGG. The self-monitoring function is checked during 10 test runs.

For information on testing the function during start-up, see *Testing the self-monitoring of the brakes according to EN 81-20, page 122*.

9.22 Saving energy with the standby function

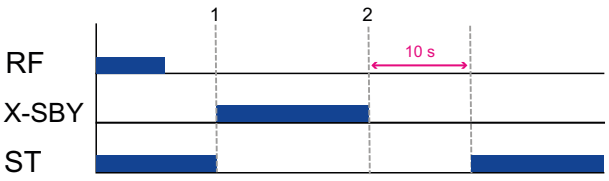
To save energy at a standstill, the frequency inverter can be switched to stand-by mode.

Prerequisite:

- Inactive controller enable RF input

ZAdynpro stand-by function

In stand-by mode, rotary encoders, all output relays including alarm relays and the controller unit are switched off. The monitoring functions are not active.



1	*Input X-SBY is activated*
2	*Input X-SBY is deactivated*
RF	*Controller enable*
X-SBY	*Input X-SBY*
ST	*Failure*

The ZAdynpro is ready for operation again 10 s after deactivation of the digital input X-SBY.

▷ Parametrise a digital input to **X-SBY** in the **Control** menu.

10 Start-up

Personnel qualifications: Start-up technician

⚠ WARNING **Risk of death due to working on the device while in operation.**

▷ Remove all persons and objects from the danger area.
▷ Activate the EMERGENCY STOP function.
▷ Check the function of the mechanical emergency brake, if fitted.

Prerequisite:

The product starts without an error message after switching on. The status LED lights up green.

Possible problems and solutions:

Problem	Cause	Remedy
Frequency inverter does not start after switching on.	Brake resistor is connected to +DC and -DC terminals at connection terminal X1 and X3.	▷ Connect the brake resistor to terminals +DC and R at connection terminal X1 and X3.
ZAdynpro stops in status 40 during the start procedure, the alarm relay of output O11-O14 is not energised, the menu can be operated.	Input voltage is too low.	▷ Check the frequency inverter input voltage.
	One phase on the mains connection is missing.	▷ Check mains connection wiring.

10.1 Testing the Safe-Torque-Off STO safety function

Test the Safe Torque Off STO safety function during first-time start-up and with periodic tests.

Procedure:

1. When the drive is at a standstill without travel signals, check the status of the two inputs STO_A and STO_B: In the **Info menu/Start/Stop**, the STO_A and STO_B inputs are marked as inactive by a small dot. A large dot is next to the DIAG display.
2. Trigger a travel command, e.g. push the UP or DOWN recovery key.
   In the **Info menu/Start/Stop**, the STO_A and STO_B inputs are marked as active by a large dot. A large dot is next to the DIAG display.
   As soon as the large dots are visible at STO_A and STO_B, remove the travel command.
3. When the drive is at a standstill without travel signals, bridge the NO contact of the relay for controlling the STO_A signal so that the STO_A input is activated.
   In the **Info menu/Start/Stop**, the STO_A input is marked as active by a large dot. A large dot is next to the DIAG display. After approx. 1 second, the displays for STO_A and DIAG change from a large dot to a small dot. All displays are marked as inactive. The ZAdynpro triggers the 960 STO diagnostics error.

Remove the bridge at the relay contact.

Reset the error by switching the line voltage off/on.

4. Repeat step 3 with the STO_B signal.
5. When the drive is at a standstill without travel signals, bridge both NO contacts of the relays for controlling the STO_A/STO_B signals simultaneously so that both inputs are activated. The ZAdynpro triggers the error 349 STO: no travel signal after 2.5 s.

   Remove the bridge at the relay contacts.

If the results of a test step do not match, contact the ZIEHL-ABEGG service hotline.

10.2 Putting ZAdynpro into operation for the first time

Personnel qualifications: Start-up technician

⚠ WARNING **Crushing hazard due to unexpected travel direction or car speed.**

The motor may start up at an unexpectedly fast speed.

▷ Check whether the electrical connections are wired according to the wiring diagram.
▷ Ensure that NO persons are endangered by the system being started up.
▷ DO NOT apply any travel signals.
▷ Activate all safety devices and check that the EMERGENCY STOP switches are working.
▷ Check that the cabin's travel path and the counterweight's travel path are clear.

Procedure:

1. Parametrising the frequency inverter:
   For detailed information on the selection options and presets, see *Menu structure, page 34*.

Step	Menu	Parameter	Selection or input	Details
1.	Start-up	LONG	Language	*1. LCD & password, page 35*
2.		USR_LEV	Level	
3.		MOT_TYP	Motor type	*2. Motor name plate, page 36*
4.		n	Motor rated speed	
5.		f	Motor rated frequency	
6.		I	Motor rated current	
7.		U	Motor rated voltage	
8.		P	Motor rated power	
9.		cos phi	Asynchronous motors: Motor power factor	
10.		TYPE	Motor circuit type	
11.		ENC_TYP	Rotary encoder type	*3. Rotary encoder & BC, page 37*
12.		ENC_INC	Rotary encoder resolution	
13.		BC_TYP	Brake resistor or brake chopper	

14.		V*	System nominal speed If the query for automatic travel curve presetting is confirmed, the travel speeds V_2 and V_3 are automatically preset in the **Travel** menu, see *Traveling speed defaults, page 109*.	*4. System data, page 38*
15.		_D	Traction sheave diameter	
16.		_is	Suspension system	
17.		_i1	Asynchronous motors: i1 of gearbox ratio	
18.		_i2	Asynchronous motors: i2 of gearbox ratio	
19.		Q	Elevator system nominal load	
20.		CONFIG	Digital inputs depending on control and type of communication	*5. Control, page 40*
21.		MO_DR	Modifying the motor rotation direction When RV1 is activated, the cabin will travel up.	
22.		BR	Brake monitoring	*6. Monitoring, page 48*
23.		P1P2	Motor temperature monitoring	
24.		K_START	Gain upon start, see list of parameters/start-up menu	*7. Starting, page 50*
25.		SPD_KP	Multiplication factor for calculated basic gain SPD_C	*12. Control , page 53*

2. Check whether the **System data menu contains n* ≤ n in the Motor name plate menu**. If not, check the system data entered.
3. Perform a data backup:
   a) Save the data on the memory card, see *Save and load parameters, lists and configurations, page 88*
   b) Store the data in the absolute encoder, see *Swapping parameters between frequency inverter and absolute encoder, page 100*.

Traveling speed defaults

Parameter	Presetting
V_2 intermediate speed	50% of V*
V_3 travelling speed	100% of V*

Irrespective of V*, the following speeds are preset:

Parameter	Presetting
V_1 positioning speed	0.05 m/s
V_Z readjustment speed	0.01 m/s
V_4 additional speed	0.30 m/s
V_5 additional speed	0.30 m/s
V_6 additional speed	0.30 m/s
V_7 additional speed	0.05 m/s

10.3 Performing the first test run with recovery control

⚠ WARNING **Risk of injury from uncontrolled motor movement.**

▷ For synchronous motors, perform rotary encoder calibration, see *Calibrating the rotary encoder for synchronous motors, page 99*.

Prerequisite:

Half-load compensation has been performed.

Procedure:

1. Carry out the first trip with recovery control and check the function of the brake: The brakes must open when starting.

   If brake monitoring is connected and activated, there are dots in the **Info menu page 9 Start/Stop** that indicate the switching function when at a standstill.

   If the motor does not rotate or the setpoint speed is not reached, check the motor data and system data, see *Putting ZAdynpro into operation for the first time, page 108* from step 4 onwards.

   If the motor data and system data have been checked and the motor does not rotate, adjust the speed controller settings: Double the parameter **Startup/SPD_KP** until the motor rotates. If the motor causes noise or vibrations, reduce the parameter Startup/SPD_KP by half of the last increase, e.g. last step + 4, new -2.
2. Check the current values and voltage values in the **Info menu page 4 MOT**: The actual speed and the target speed must match; the voltage during recovery trips must be below the maximum of 360 V.

Error messages, see *Troubleshooting, page 125*

10.4 Setting the switch-off points

Procedure:

▷ Set the switch-off points for the travelling speed V_1 between 2 and 5 cm before flush engagement depending on the deceleration setting A_NEG.

▷ Set the switch-off points for the travelling speeds V_3 and V_2.

The calculated deceleration paths to V_1 or standstill with a DCP2 and DCP4 protocol can be read in the **Info menu/page 3**:

s31: V_3 to V_1; distance from switch-off point speed V_3 until speed V_1 is reached

s30: V_3 to standstill; distance from switch-off point speed V_3 to standstill.

s21: V_2 to V_1; distance from switch-off point speed V_2 until speed V_1 is reached

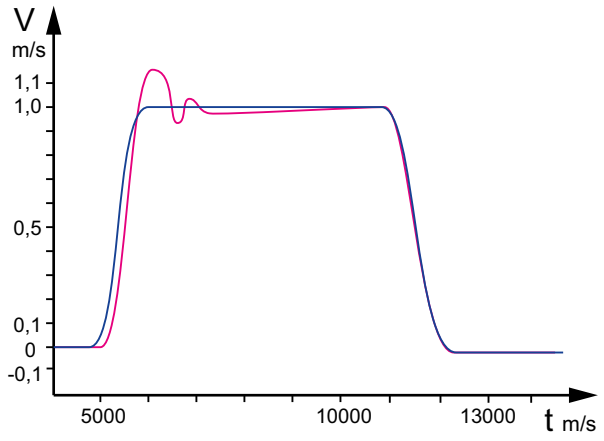
s20: V_2 to standstill; distance from switch-off point speed V_2 to standstill.

10.5 Performing normal travel

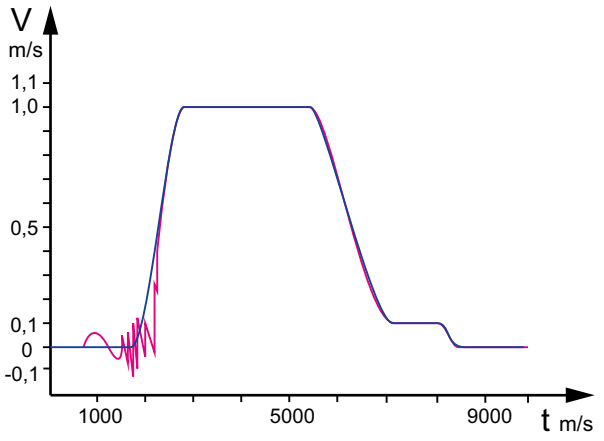
Procedure:

1. Trigger a trip over several floors via the control, DO NOT select a terminal stop.
2. Fine-tuning the speed controller settings:

Control deviations when the gain is set too low



Vibrations when the gain is set too high



blue = setpoint travelling speed

red = actual value of travelling speed

▷ If the motor shows signs of overshooting during acceleration, increase the parameter **Startup/SPD_KP**.

▷ If the motor causes noise or vibrations during start-up, reduce the parameter **Startup/SPD_KP**.

If the optimum basic gain setting is configured under **Startup/SPD_KP** and the traction sheave continues to rotate in the direction of the load to be pulled, increase the value in the **Startup/K_START** menu.

Error messages, see *Troubleshooting, page 125*

10.6 Adjusting the travel characteristics

Travel options, page 111

Optimising start-up behaviour, page 114

Optimising acceleration, page 115

Parametrising distance-dependent deceleration, page 115

Parametrising time-dependent deceleration, page 117

Optimising deceleration, page 119

Optimising the creep path, page 119

Optimising stopping behaviour, page 120

Optimising flush alignment, page 121

Direct engagement, page 122

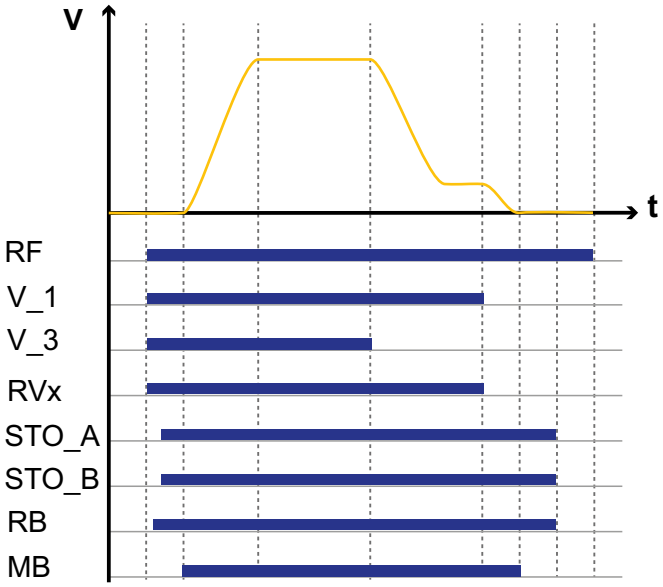
10.6.1 Travel options

To be able to travel, the frequency inverter requires the following input signals:

- Controller enable RF
- Speed specification
- Direction specification RV1 or RV2
- Enable contactorless operation STO_A and STO_B

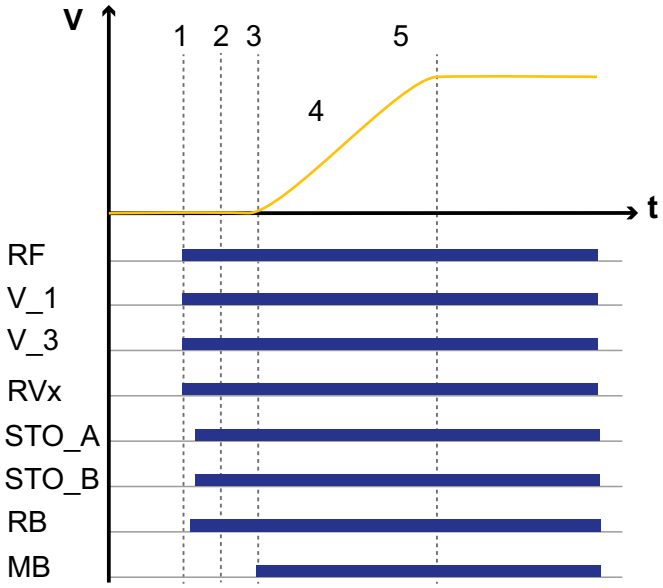
Normal travel

Sequence of a travel operation with signal paths of inputs and outputs.



Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

Starting with default acceleration



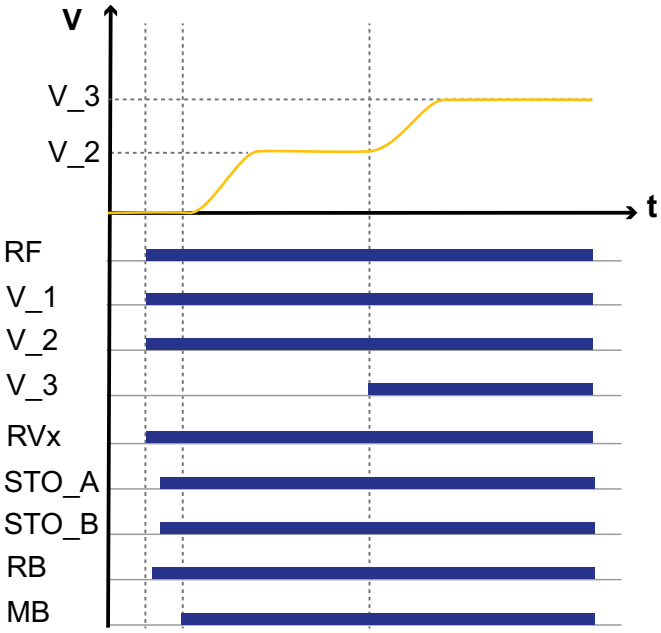
Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

1	The elevator control activates the input functions RF, V_1, V_3 and RVx of the frequency inverter.
2	The frequency inverter activates the RB output function. With this signal, the STO_A and STO_B must be activated without a delay.
3	The frequency inverter switches the MB output function with a time delay. The brakes must be opened.
4	The frequency inverter accelerates the motor to the maximum controlled speed V_3.
5	The target speed V_3 has been reached.

Starting up with intermediate speeds

During distance-dependent start-up, the elevator can be accelerated to various intermediate speeds.

Example of starting with acceleration from V_1 to V_3:



Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_2	*Intermediate speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

Start-up variants

Depending on the motor type, the start-up variants are preset in the **Motor name plate** menu:

- Asynchronous motors: MOD1
- Synchronous motors: MOD5

Additional start-up variants are only required in special cases.

The various start-up variants can be configured in the **Start-up/M_START** menu. The amplification of the speed or position controller K_START is configured in the **Start-up/K_START** menu.

MOD1: The drive is rpm-controlled. Up to the end of T_2, the speed is maintained at setpoint = 0. A change in position of the drive is not corrected. K_START is used to increase the speed controller gain and is activated at the start of T_1 and deactivated at the end of T_2.

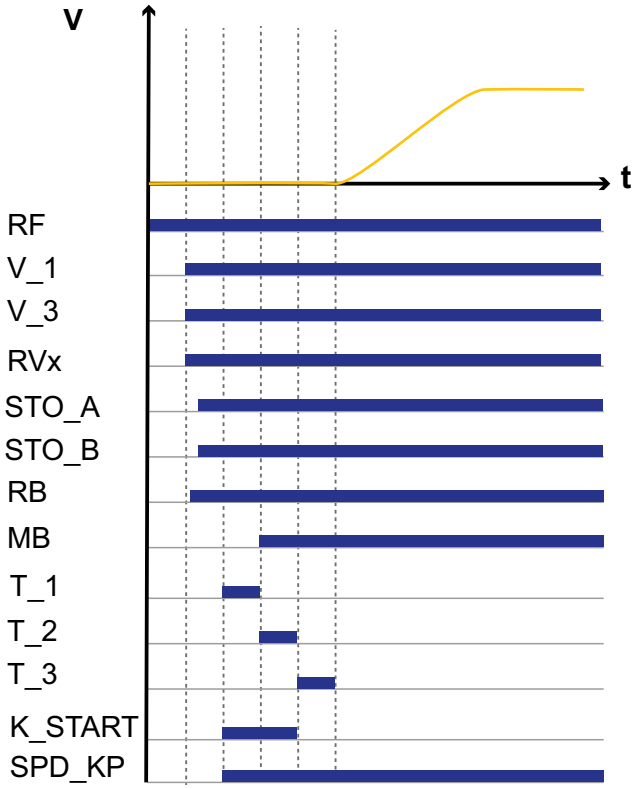
MOD2: The parameter s_start is activated in addition to MOD1. If the drive position changes during the time T_2 by the value entered in s_start, K_START is switched off.

MOD3: The drive is speed-controlled and also position-controlled. The parameter K_START defines the amplification of the position controller and, at the same time, the amplification of the speed controller is increased by this factor. The position control is activated at the start of T_1 and deactivated at the end of T_2. At the same time, at the end of T_2, the increase of the speed controller amplification is switched off.

MOD4: The drive is speed-controlled and also position-controlled. The parameter K_START defines the position controller amplification. The position control is activated at the start of T_1 and deactivated at the end of T_2. If the drive position changes during the time T_2 by the value entered in s_start, K_START is switched off immediately.

MOD5: The drive is speed-controlled and also position-controlled. The parameter K_START defines the position controller amplification. The position control is activated at the start of T_1 and deactivated at the end of T_2.

Start-up behaviour

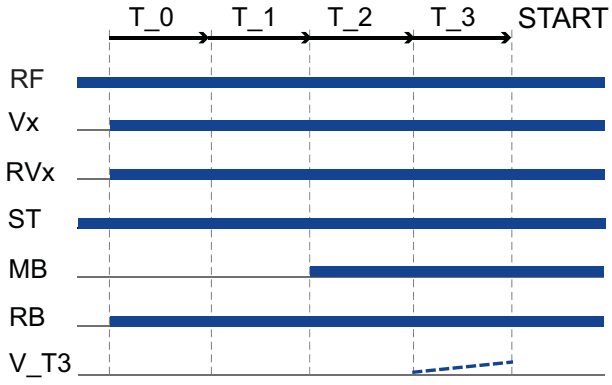


Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*
Times	
T_1	*Flux build-up time*
T_2	*Brake opening time*
T_3	*Time hold speed = 0*
Speed controller and position controller setting	
K_START	*Amplification at start dependent on MOD1 to MOD5*
SPD_KP	*Speed controller basic gain*

10.6.2 Optimising start-up behaviour

The start-up behaviour can be optimised if the level of travel comfort is insufficient, e.g. when starting off with a jerk or roll backwards.

Start-up time sequence



Input signals	
RF	*Controller enable*
Vx	*Travelling speed*
RVx	*Direction of travel*
Output signals	
ST	*Controller failure*
MB	*Mechanical brake*
RB	*Controller ready*
Times	
T_0	*Time until motor contactors have engaged*
T_1	*Asynchronous motors: Time until magnetic flux has built up*
T_2	*Time until brake is opened*
T_3	*Time during which the motor is kept at speed 0 or accelerated to V_T3*

Procedure:

1. Check the mechanical condition of the system, e.g. rail guide, car suspension, transmission oil level, etc.

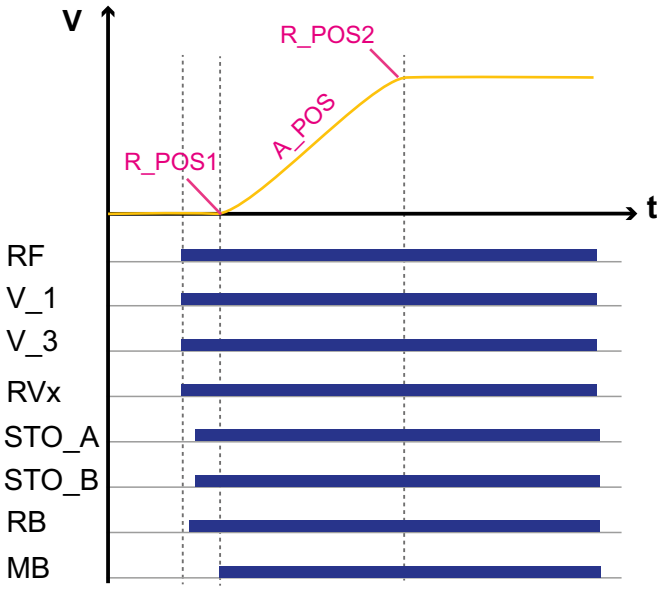
2. In the **Start-up** menu, parametrise the times **T_0 to T_3**.

   If monitoring of the contactors is activated in the **Monitoring CO** menu and the monitoring contacts are connected, the time T_0 is cancelled as soon as the contactors are closed.

   If brake monitoring is activated in the **Monitoring BR** menu and the monitoring contacts are connected, the time T_2 is cancelled as soon as the brakes are opened.
3. To reduce a starting jolt caused by static friction, set the parameter **V_T3** to a value not equal to 0. As a result, acceleration from T_3 to V_T3 is linear during this process.
4. To prevent roll-back during start-up, boost the speed controller at the moment when the brake opens: In the **Startup/SPD_KP** menu, increase the parameter until the motor does not generate any uncontrolled movement in the traction sheave in the direction of the pulling load and does not cause any noises or vibrations.

10.6.3 Optimising acceleration

The acceleration ramp is defined by the parameters A_POS, R_POS1 and R_POS2 in the **Accelerate** menu, see *8. Accelerating, page 51*.



Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

▷ To achieve optimum start-up behaviour, activate the STO function inputs or the motor contactors immediately with the digital output RB and switch the brake with the digital output MB without delay.

10.6.4 Parametrising distance-dependent deceleration

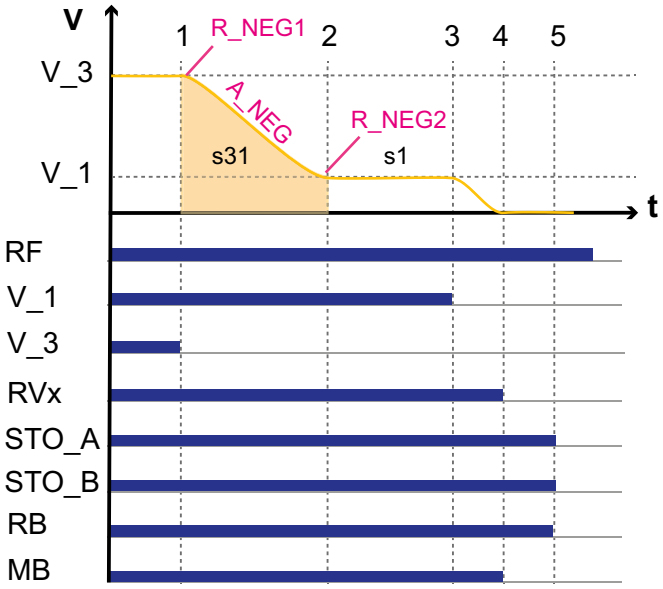
The deceleration distances are identical regardless of the speed reached at the starting point of deceleration. All decelerations from higher to lower speeds are dependent on the distance.

If the fast travelling speed signal V_3 is briefly switched off, the frequency inverter decelerates the motor to the positioning speed V_1. If all inputs for the travelling speeds have been switched off and the motor has reached speed 0, it is possible to actuate a higher travelling speed.

Prerequisite for binary speed specification: Parametrised in the **Control/SIM_V1=ON** menu.

Distance-dependent deceleration - default

The distance s31 is calculated automatically depending on the parameters A_NEG, R_NEG1 and R_NEG2. s31 is the distance travelled, from the point when V_3 is switched off until V_1 is reached.

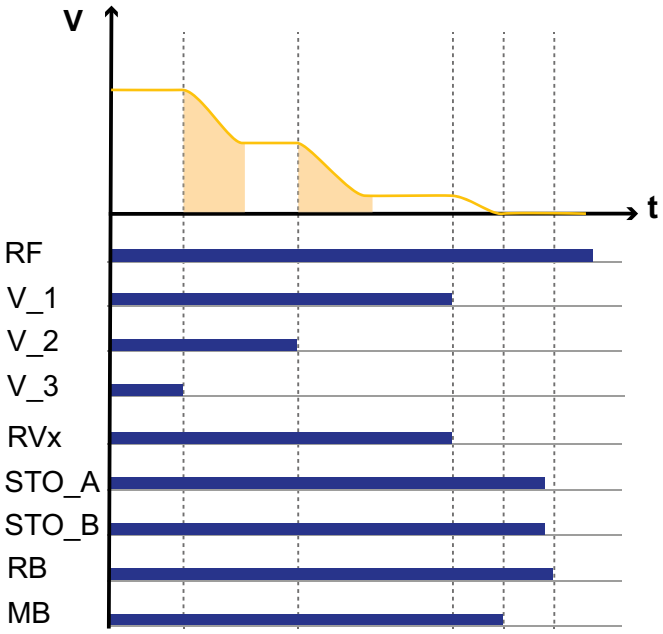


Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

1	When the switch off point for the travelling speed is reached, the configured final speed V_3 is reached. Deceleration is initiated
2	Travel at positioning speed V_1
3	Positioning speed V_1 is switched off. The motor decelerates to a standstill. This results in the distance s1.
4	Speed = 0. Output MB is switched off. The brake must engage immediately. The motor continues to be energised.
5	The current supply to the motor is switched off. The RB output is switched off. The STO function inputs must be deactivated immediately or the motor contactors de-energized.

Distance-dependent deceleration with intermediate speed

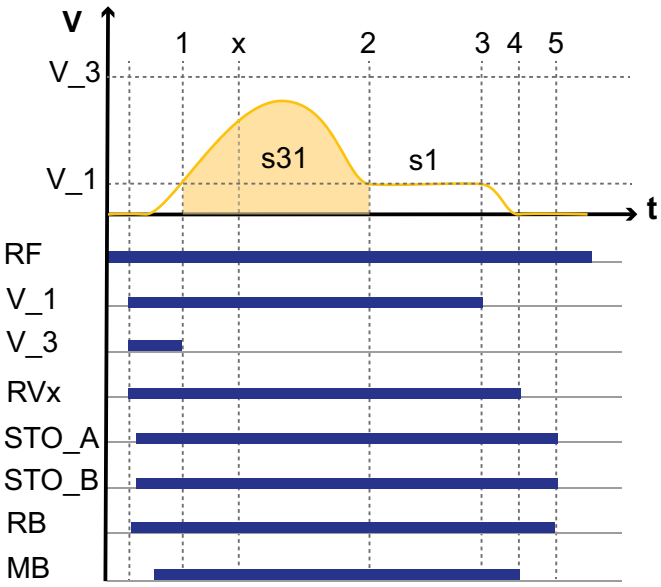
When stopping with distance-dependent deceleration, it is also possible to decelerate from V_3 to V_2.



Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_2	*Intermediate speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

Round trip with distance-dependent deceleration

If the selected travelling speed V_2 or V_3 is not reached when the distance between the floors is short, the frequency inverter implements a round trip. The round trip means that the same creep paths are achieved regardless of the speed reached at the switch-off time.



Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

1	When the switch off point for the travelling speed is reached, the configured final speed V_3 is not reached yet. The motor continues to accelerate. The frequency inverter calculates the further travel curve so that the distance s31 is covered in the shortest time with the set acceleration and deceleration values up to point 2.
x	Deceleration is initiated.
2	Travel at positioning speed V_1.
3	Positioning speed V_1 is switched off. The motor continues to decelerate.
4	Speed = 0. Output MB is switched off. The brake must engage immediately. The motor continues to be energised.
5	The current supply to the motor is switched off. The RB output is switched off. The STO function inputs must be deactivated immediately or the motor contactors de-energized.

For normal travel and a round trip, the deceleration paths S31 from V_3 to V_1 and the creep paths V1 to speed 0 are identical, S1 only for DCP1 and DCP3.

Procedure for distance-dependent deceleration:

Deactivate distance-dependent deceleration in the **DECELERATE/S_ABH** menu:

1. Activate the digital input for travelling speed V_1.
   If, for technical reasons, it is not possible to actuate 2 travel speeds at the same time, e.g. actuation of the speeds via a changeover contact, activate distance-dependent deceleration with the parameter **Control/SIM_V1=ON**.
2. Deactivate the digital input for the travelling speeds V_3 or V_2. Activate positioning speed V_1 no later than 100 ms after deactivation of travelling speeds V_3 or V_2.

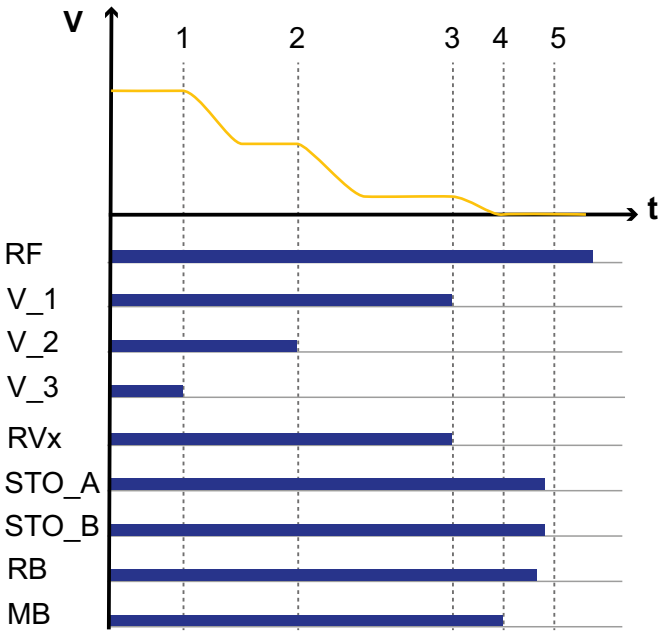
10.6.5 Parametrising time-dependent deceleration

The deceleration distances are dependent on the speed reached at the starting point of deceleration. Time-dependent deceleration makes sense when the maximum travelling speed is reached during every trip.

After switching off the current speed specification, the motor is decelerated to the highest speed still triggered

depending on the time and according to the configured deceleration and rounding. Time-dependent deceleration is active for all speed transitions.

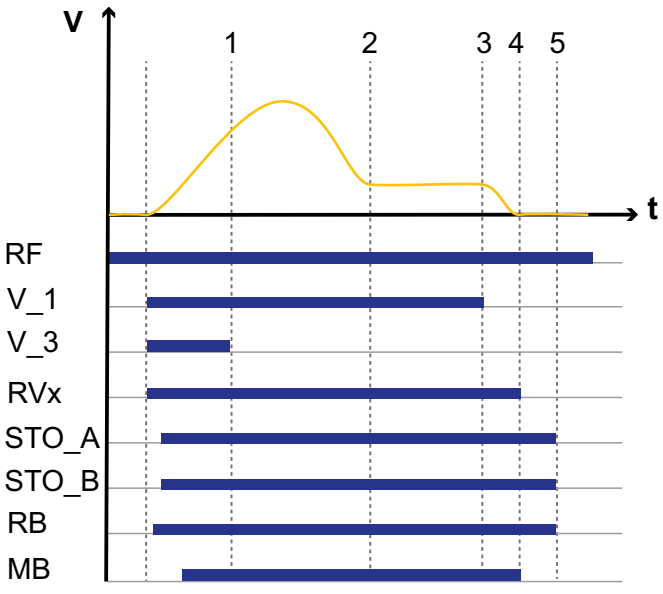
Deceleration when travelling speed is reached



Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_2	*Intermediate speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

1	When the switch off point for the travelling speed is reached, the configured final speed V_3 is reached. Deceleration after V_2 is initiated.
2	Switch-off point for V_2. Deceleration after V_1 is initiated.
3	The positioning speed V_1 is switched off. The motor continues to decelerate.
4	Speed = 0. Output MB is switched off. The brake must engage immediately. The motor continues to be energised.
5	The current supply to the motor is switched off. The RB output is switched off. The STO function inputs must be deactivated immediately or the motor contactors de-energized.

Deceleration when travelling speed is not reached



Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

1	When the switch off point for the travelling speed is reached, the configured final speed V_3 is **not** reached. Deceleration is initiated.
2	Travel at positioning speed V_1
3	The positioning speed V_1 is switched off. The motor continues to decelerate.
4	Speed = 0. Output MB is switched off. The brake must engage immediately. The motor continues to be energised.
5	The current supply to the motor is switched off. The RB output is switched off. The STO function inputs must be deactivated immediately or the motor contactors de-energized.

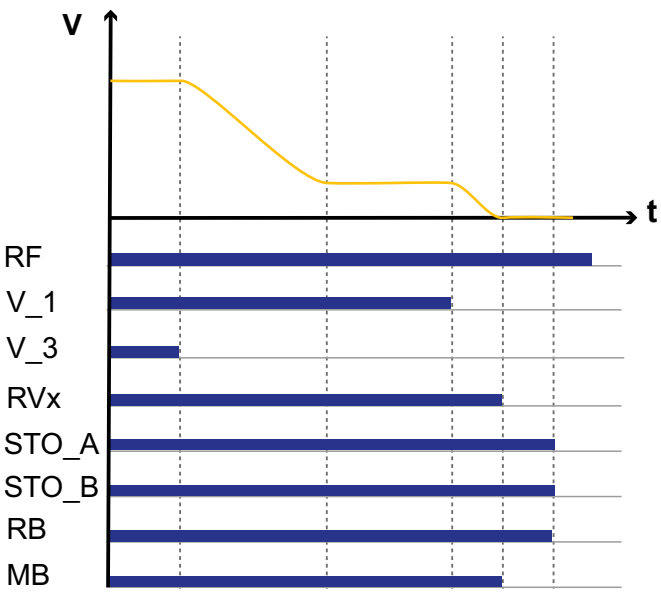
If the travel time is monitored by the control, a fault message may occur due to long travel time at travelling speed V_1.

If the fast travelling speed is switched off shortly before the set final speed is reached, the elevator may move past the floor.

▷ Configure the parameter in the **DECELERATE/S_ABH = OFF** menu.

10.6.6 Optimising deceleration

The deceleration ramp is defined by the parameters in the **Decelerate** menu, see *10. Decelerating, page 52*.



Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

▷ Adjust the parameter values in the **Decelerate** menu according to requirements. The adaptation changes the deceleration path from V_3 to V_1. The newly calculated distance is shown in the display.

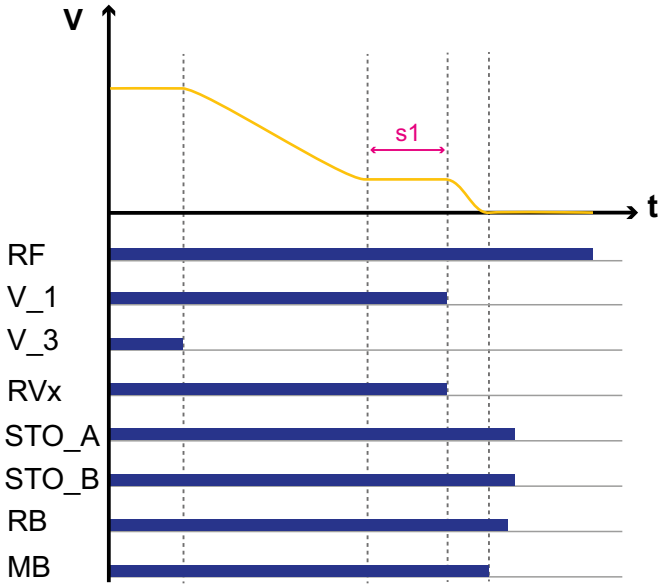
▷ If necessary, adjust the switch-off point for V_3.

10.6.7 Optimising the creep path

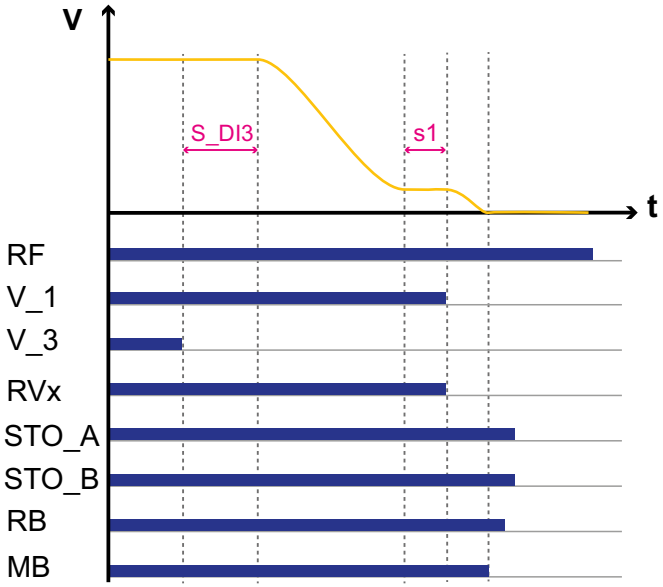
Optimization of excessively long creep paths with travelling speed V_1 or non-flush stopping by switching off V_1 too early without additional assembly effort.

The creep path optimization in the **DECELERATE/S_DI1, S_DI2** and **S_DI3** menu decelerates switch-off of the travelling speeds V_1, V_2 and V_3 at all floors by the configured value. If the values for s1 are different, the same creep path cannot be achieved on all floors.

Deceleration with non-optimised creep path



Deceleration with optimised creep path



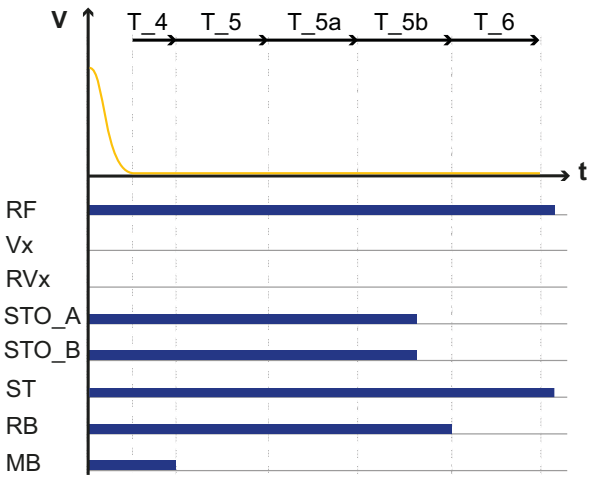
Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

Procedure:

1. Approach each floor from both directions of travel at maximum travelling speed V_3 or V_2 and check the creep path s1 in menu **INFO/page 03 Dist**. The value for s1 should be the same on all floors from both directions of travel. For different creep paths, use the smallest value for s1.
2. In the **DECELERATE/S_DI3** or **S_DI2** menu, modify to the value determined for s1.
3. Check the deceleration behaviour and adjust the values for **S_DI3** or **S_DI**2 if necessary.

10.6.8 Optimising stopping behaviour

Time sequence for stopping



Input signals	
RF	*Controller enable*
Vx	*Speed*
RVx	*Direction of travel*
Output signals	
ST	*Controller failure*
RB	*Controller ready*
MB	*Mechanical brake*
Times	
T_4	*Hold speed at 0*
T_5	*Wait until brake is closed*
T_5a	*additional current supply of the motor*
T_5b	*Wait until motor is de-energised*
T_6	*Wait until the motors contactors are open*

Time optimization through brake monitoring

With active brake monitoring, **Monitoring/BR≠Off**menu and connected monitoring contacts, the time T_5 is optimised. As soon as the brakes are closed, the time T_5 is interrupted and the time T_5b is started.

Time optimization through contactor monitoring is optional

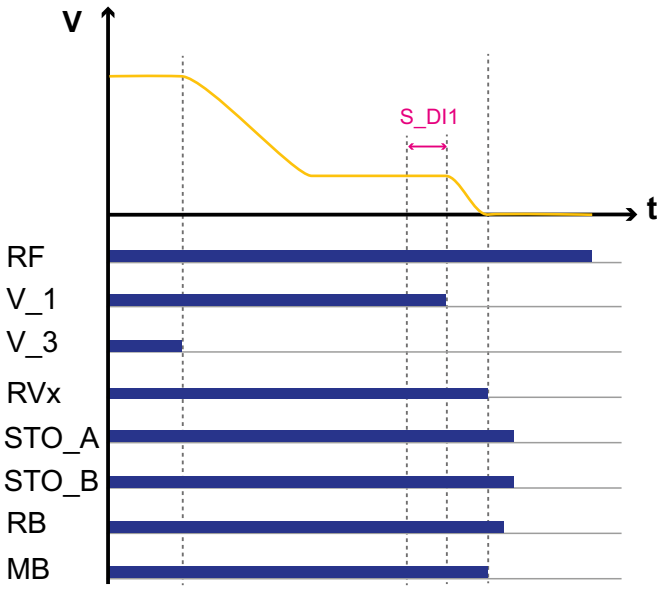
With contactor monitoring active, **Monitoring/CO=ON** menu and monitoring contacts connected, the time T_6 is optimised. As soon as the brakes are opened, the time T_6 is interrupted and the halt process ends.

Procedure:

▷ Parametrise the respective monitoring function in the **Monitoring** menu.
▷ Configure the various times in the **Stop** menu.

10.6.9 Optimising flush alignment

If the cabin does not stay flush when stopping on a floor, the flush can be optimised.



Input signals	
RF	*Controller enable*
V_1	*Positioning speed*
V_3	*High travelling speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*

Procedure:

1. Engage on every floor from both travel directions and ascertain the distance from flush engagement by measuring manually.
2. In the **DECELERATE/S_DI1** menu, modify to the determined value. If the distances are different, enter the smallest value.

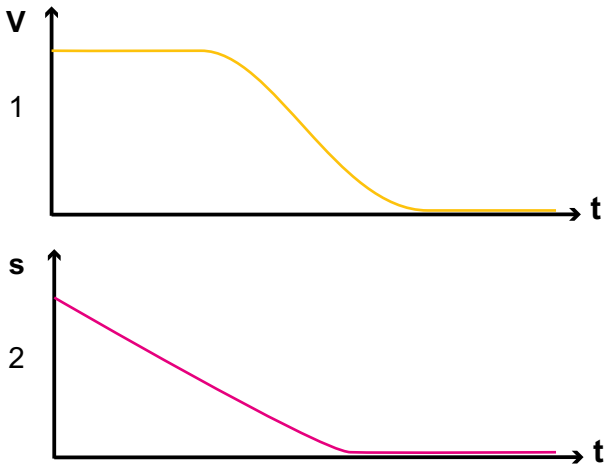
10.6.10 Direct engagement

Prerequisite:

- DCP2 protocol, DCP4 protocol or CANopen Lift protocol in position mode
- Absolute shaft copy

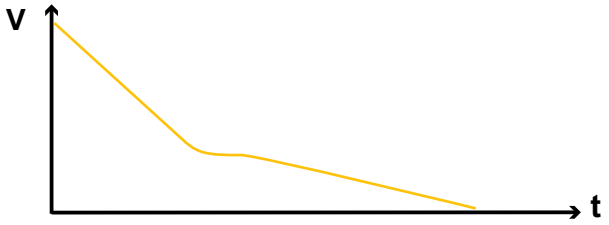
The control specifies the remaining distance to the stop for the frequency inverter. The frequency inverter slows down the motor in accordance with the specified remaining distance, without a creep distance. Direct engagement enables intermediate speeds to be actuated.

Direct engagement **Decelerate/S_ABH=ON(V2..3)**



1	*Travelling speed*
2	*Remaining distance*

If the **Decelerate/S_ABH=Slow** parameter is set, engagement takes place with an early reduction in engagement speed.



10.7 Testing the self-monitoring of the brakes according to EN 81-20

If the power pack's brakes are used as braking elements to protect against unintended movement of the car or to protect against overspeeding of the ascending car, a functional test of the self-monitoring function must be carried out during start-up.

Procedure:

1. Disconnect the signal cable from a monitoring input.
2. Perform a test run. If, at the start, the error message **380 BR:Start error** is issued with NC contacts or the error message **582 BR:T2 too small** or **346 BR:T2 too small** is issued with NO contacts, the monitoring is OK. The frequency inverter locks itself and cannot travel any further.
3. Connect the signal cable.

4. To check the locking, perform a test run. The test run must not be possible, the frequency inverter remains locked.
5. Release the lock: Activate the **Monitoring/UNLOCK = On** menu.
6. Start a trip. If this is carried out without errors, the test of this monitoring input is OK.
7. Repeat steps 1 to 6 for every monitor input.
8. Disconnect the signal cable at a monitoring input and short-circuit the monitoring input with the internal 24V DC voltage source of the frequency inverter, e.g. +24V_OUT to X-BR.
9. Perform a test run. If, at the start, the error message **346 BR:T2 too small** or **582 BR:T2 too small** is issued with NC contacts or the erro message **380 BR:Start error** is issued with NO contacts, the monitoring is OK. The frequency inverter locks itself and cannot travel any further.
10. Remove the short circuit and connect the signal cable.
11. To check the locking, perform a test run. The test run must not be possible, the frequency inverter remains locked.
12. Release the lock: Activate the **Monitoring/UNLOCK = On** menu.
13. Start a trip. If this is carried out without errors, the test of this monitoring input is OK.
14. Repeat steps 8 to 13 for every monitor input.

10.8 Supporting acceptance testing

Testing the rotary encoder

Rotary encoder failure is simulated via the firmware. The test function can also be activated during travel.

Procedure:

1. Parametrise **Tests/SCY_EN=On** in the menu.
2. Parametrise **Tests/SCY_ENC=On** in the menu.
3. Send a travel signal. Travel is aborted with an error message, as the rotary encoder is deactivated.

Testing the protective device against unintentional movement of the car in accordance with EN 81-20

Checking the protective device to prevent unintentional movement of the car away from the stopping place.

⚠ WARNING **Danger to the system and persons due to uncontrolled movement of the elevator.**

The monitoring functions of the ZAdynpro are deactivated.

▷ NO persons in the shaft
▷ Check that the cabin is empty.

a) Cabin rolls away from the floor without power

The output stage is switched off, the motor brake is opened, the cabin runs down.

Procedure:

1. Activate **Tests/SCY_EN=On** in the menu.
2. Activate **Tests/SCY_A3=deenergised** in the menu. The display shows the message that the brake will be opened during the next trip.
3. Send a travel signal. The test begins.

b) Travel with maximum acceleration from floor

The output stage is switched on, the brakes are open, the cabin is accelerated at the maximum rate under full current supply.

ATTENTION **Demagnetisation of the motor possible by the test run with maximum acceleration.**

▷ ONLY possible with ZIEHL-ABEGG motors. NO warranty for third-party products.
▷ Allow the motor to cool down before testing.

Procedure:

1. Activate **Tests/SCY_EN=On** in the menu.
2. Activate **Tests/SCY_A3=max. acc.** in the menu. The display shows the message that maximum acceleration is reached.
3. Send a travel signal. The test begins.

Testing the safety catch

If the motor windings are short-circuited by a contactor, the short-circuit is deactivated by the function. After switching on the function, the brakes must be opened manually.

⚠ WARNING **Danger to the system and persons due to uncontrolled movement of the elevator.**

The monitoring functions of the ZAdynpro are deactivated.

▷ NO persons in the shaft
▷ Check that the cabin is empty.

Procedure:

1. Activate **Tests/SCY_EN=On** in the menu.
2. Activate **Tests/SCY_SG=ON** in the menu. The display shows the message that the electronic short circuit is deactivated.
3. Open the brakes manually.

Testing traction conditions with CAN actuation

When the counterweight is applied, the cabin will move upwards. The display shows the car movement.

Procedure:

1. Use the recovery control to move upwards until the counterweight is resting on the buffer.
2. Activate **Tests/SCY_EN=On** in the menu.
3. Activate **Tests/SCY_DA=ON** in the menu.

   ATTENTION! Damage to suspension means due to too much time spent sliding over the traction sheave

   ▷ Allow the suspension means to slide over the traction sheave for a maximum of 5 seconds.
4. Use the recovery control to move upwards until the suspension means slide over the traction sheave. Car movement is displayed.

Testing the motor brakes with CAN actuation

The function interrupts the safety circuit during travel. The display shows the distance until the cabin reaches a standstill.

Procedure:

1. Activate **Tests/SCY_EN=On** in the menu.
2. Activate **Tests/SCY_MB=ON** in the menu.

3. Issue an upward travel command with an empty cabin.
   Interrupt the safety chain.
4. The distance to standstill is shown on the display.

11 Troubleshooting

Personnel qualifications: Maintenance personnel

Status, failures, troubleshooting are displayed in different ways:

Display, page 125

Status LED, page 126

Fault memory, page 127

Error list, page 128

11.1 Display

If the frequency inverter detects an error, the current travel program is aborted and the following outputs are switched off:

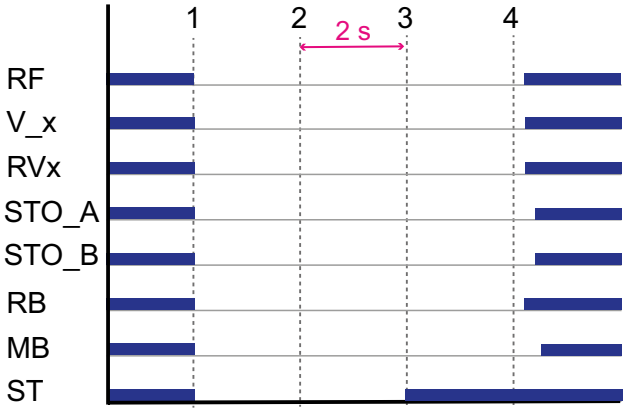
- ST failure
- RB Controller ready
- MB Mechanical brake

The control must immediately close the electromechanical holding brake and interrupt the STO_A and STO_B inputs or open the motor contactors.

If there are no input signals for travelling speeds, the error is automatically acknowledged 2 seconds after the cause of the error has been rectified. If travel signals are applied before the 2 seconds have elapsed, there is no error acknowledgement.

Exception: Errors with error numbers 900 to 999 are acknowledged by a restart, see *9xx Serious error, page 144*

Acknowledge error



Input signals	
RF	*Controller enable*
Vx	*Speed*
RVx	*Direction specification*
STO_A	*Enable contactorless operation*
STO_B	*Enable contactorless operation*
Output signals	
RB	*Controller ready*
MB	*Mechanical brake*
ST	*Failure*

1	Error detected
2	Error is no more present
3	Automatic acknowledgement when Vx=0
4	New travel command

11.2 Status LED

Position of the status LED, see *Interfaces size 011-032, page 10* or *Interfaces size 040-074, page 11*.

Operating state ZAdynpro with standard actuation

Colour	Status LED status	Operating state
Green	Flashes 1 time per second	At a standstill
Green	Flashes 2 times per second	Travel

Operating state with DCP actuation

Colour	Status LED status	Operating state or error	Remedy
Green	Lights up	Everything OK	-
Red	Flashes quickly	DCP connection is missing or faulty.	▷ Check the DCP connection.

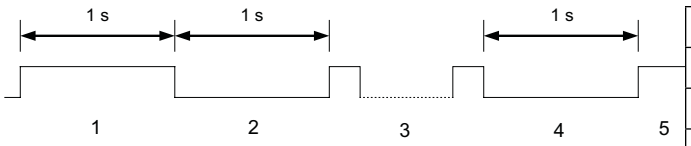
Operating state with CAN actuation

LED colour	Status LED status	Operating state or error	Remedy
Green	Lights up	Everything OK	-
Red	The function of the status LED corresponds to the CANopen Lift 417 standard.		▷ Check CAN connection ▷ Check bus termination, see *Controller Area Network CANopen Lift, page 24* ▷ Check the screening of all shielded cables, see *Electromagnetic compatibility EMC, page 16* ▷ Check the earthing of the motor.

An operating state and an error state can occur simultaneously and are indicated simultaneously by the status LED.

Firmware update error

When the ZAdynpro is accessing the memory card, the status LED lights up blue. In the event of an error, the status LED lights up white in the following sequence:



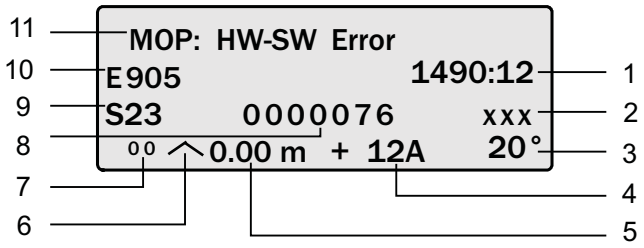
1	White for 1 second
2	Break for 1 second
3	Flashing code with number of impulses
4	Break for 1 second
5	Cycle repeats

Number of impulses	Error	Remedy
1	EEPROM missing.	▷ Contact the service hotline.
2	No update on memory card.	▷ Load update to memory card. Extract files
3	Memory card firmware identical to product firmware.	▷ Load latest update to memory card.
4	No valid update on memory card.	▷ Load update to memory card. Extract files.
5	Update firmware files not identical.	

Number of impulses	Error	Remedy
6	External RAM of the application processor defective.	▷ Contact the service hotline.
7	A restart is performed after error 25.	▷ Perform firmware update without operating terminal.
8	Internal programming voltage does not switch on or off.	▷ Check if the prog button is blocked.
14	Internal programming voltage does not switch on.	
16	Error when deleting program memory.	
17	Error while writing the program memory.	
18	Error in written files in program memory.	
19	Internal programming voltage does not switch off.	▷ Check if the prog button is blocked.
23	Memory card removed prematurely.	
25	Checksum of the update code is incorrect.	

11.3 Fault memory

Errors that lead to interruption of travel are stored in an error list in the **Statistics/ST_LST** menu. A maximum of 64 error messages are stored. If there are multiple messages, the oldest entry is deleted. When calling up the error list, the last error is displayed first:



	Normal display	i key pressed
1	Operating hours	Time display indicating how long ago the error occurred
2	Optional additional information	
3	Power unit temperature	-
4	Motor current consumption	-
5	Position in shaft	-
6	Direction of travel	-
7	Serial number	Status in which the error occurred
8	Trip number	How many trips ago the error occurred
9	Operating state S = status	
10	Error number	
11	Error description	

In CANopen Lift mode and DCP mode, the time (7) and date on which an error occurred are displayed.

Delete error list

The following parameters are reset in the **Statistics/ST_CLR = ON** menu:

- ST_LST error list
- ST_RES Number of interruptions to the voltage supply
- ST_SRF Number of trip interruptions due to interruption of controller enable
- ST_SCO Number of trip interruptions due to interruption of contactor monitoring

Mask errors

⚠ WARNING **Injuries due to suppressed error messages**

Consequential faults may occur when masking errors.

▷ Use the Mask function only for troubleshooting.

▷ Eliminate the cause of the fault before continuous service.

Individual errors can be deactivated by entering the error number in the error mask in the menu **Monitoring/ MASK1-5**, see *Error list, page 128*. Errors that can be masked are marked with a **dot** in column **M** in the error list. Enter the error number in one of the error masks in the **Monitoring/MASK** 1-5 menu.

Block function

If several errors marked in column S occur during directly consecutive travel attempts, the frequency inverter is locked. The fault counter is set to 0 after error-free travel.

The following block functions can be set in the **Monitoring/MOD_ST** menu:

Function	Output relay ST....
Fix 2 sec.	is de-energised for at least 2 seconds and is then energised again. A speed specification V_x must not exist.
Lock no. 3	remains de-energised after the 3rd error.
Lock no. 2	remains de-energised after the 2nd error.
Lock no. 1	remains de-energised after the 1st error.

11.4 Error list

0xx notes, page 128

1xx Hardware configuration or firmware error, page 129

2xx Error during parametrisation, page 130

3xx Error before start of travel, page 131

4xx Error , page 135

5xx Error, page 137

7xx - 8xx errors, page 142

9xx Serious error, page 144

Information text, page 149

0xx notes

Information about the content of the fault memory, changes in operating states, and applications of special frequency inverter functions.

No.	Text	Cause	Remedy	M	S
0	Memory empty	Fault memory empty	-		
10	Firmware update	Firmware update completed	-		
20	MOT_TYP changed	Motor type has been changed in the Motor name plate menu	-		

No.	Text	Cause	Remedy	M	S
40	Line fault	1 phase of the supply network not detected 30 s after switching on	▷ Check line voltage		
50	Suspension means warning				
51	Suspension means alarm				
52	Battery warning				
53	Battery alarm				
54	Oil warning				
55	Oil alarm				
77	ST_LST: locked	The last error entered occurred more than 5 times in succession.		•	
80	Mode: Evac.->Norm	Switchover from evacuation mode to normal mode completed	-		
81	Mode: Norm.->Evac.	Switchover from normal mode to evacuation mode completed	-		
85	Mode: Safety brk	Capture release safety brake function executed	-		•
86	Mode: Enc. adj. MB	Rotary encoder calibration with the brake closed has been completed			
87	Mode: Encoder adj.	Load-free encoder calibration with the brake open has been completed			
88	Mode: Encoder check	Load-free check of the encoder calibration has been completed			
89	Mode: Glue magnets	Magnet adhesion process for DISCcontrol has been completed			

1xx Hardware configuration or firmware error

No.	Text	Cause	Remedy	M	S
108	HW-IDENT: Wrong no.	ID no. of an assembly is not known	▷ Refresh firmware, see *Performing a firmware update, page 86*.		
109	MASH or ID missing	Master shunt or IGBT driver card not found	▷ Contact the service hotline.		
110	CU: No ID	ID no. of processor board CU not detected.	▷ Contact the service hotline.		
111	CUSH missing	ID no. of shunt module CUSH not detected	▷ Contact the service hotline.		
115	SP missing	ID no. of switching power supply board SP not detected	▷ Contact the service hotline.		
116	PP missing	ID no. of power unit board PP not detected	▷ Contact the service hotline.		
117	MP missing	ID no. of the power unit board MP not detected.	▷ Contact the service hotline.		
118	PU missing	ID no. of the power unit board PU not detected.	▷ Contact the service hotline.		
119	DC missing	ID no. of DC-link board DC not detected.	▷ Contact the service hotline.		
121	CUSH: ID error	Prohibited combination of assemblies CUSH	▷ Contact the service hotline.		
130	Unknown hardware	ID no. of an assembly is not known	▷ Refresh firmware, see *Performing a firmware update, page 86*.		
131	INFB conflict	ID no. of an assembly is incorrect	▷ Contact the service hotline.		

No.	Text	Cause	Remedy	M	S
140	MP:Unknown IGBT	Unknown IGBT module	▷ Contact the service hotline.		
150	HW conflict	Assemblies not compatible	▷ Contact the service hotline.		
160	ADC-Adj.: Except tol.	Incorrect measured values from current recording during switch-on	▷ Switch frequency inverter off and then back on. ▷ Contact the service hotline.	•	
174	CUMT: Missing	Hardware module for monitoring the motor temperature not detected.	▷ Check the installation condition of the circuit board. ▷ In the **Monitoring/P1P2 = Off** menu. ▷ Replace the board.	•	•

2xx Error during parametrisation

No.	Text	Cause	Remedy	M	S
200	Stop input	When activating a travel command using the elevator control, a parameter is selected for modification.	▷ End parameter input.		
201	Motor name plate	Parameters in the motor name plate menu are incorrect.	▷ Check parameters in the **Motor name plate** menu.		
203	n* = 0	Parameter n* = 0 in the System data menu.	▷ Enter the n* parameter.		
205	Input duplicated	2 digital inputs have the same function.	▷ Modify the function assignment in the Control menu.		
206	n* > 1.2* n	The calculated motor speed n* in the System data menu is at least 20% above the set nominal speed n in the Motor name plate menu.	▷ Check the parameters in the **System data** and **Motor name plate** menus.	•	
207	Input PFU_BR missing	If power recuperation unit and brake resistor are used, the temperature monitoring of the brake resistor is not programmed.	▷ Configure a digital input in the Control menu to the PFU_BR function.		
210	Wrong ENC_TYPE	Rotary encoder type for the motor and motor type do not match.	▷ Check **Encoder & BC/ENC_TYP** and **Motor name plate/MOT_TYP** in the menu.	•	
213	ZR_EN / ZR_RDY missing	ZR_RDY or ZR_EN not parametrised when a ZArec4 power recuperation unit is used.	▷ In the Control menu, parametrise a digital input to ZR_RDY and a digital output to ZR_EN.		
215	No HIPERFACE	Absolute encoder for motor with Hiperface interface selected. DO NOT use these types of encoders.	▷ Select the appropriate absolute encoder in the **Encoder & BC/ENC_TYP** menu. ▷ Replace the absolute encoder on the drive.		
220	Wrong SM data	Values for rated speed n and rated frequency f in conflict.	▷ In the **Motor name plate/n**or **f** menu, correct: n=f*60/p		
221	Wrong ASM data	Values for rated speed n and rated frequency f in conflict.	▷ In the **motor name plate/n** or **f**, correct		
231	V_G1 > 150% V*	Limit value V_G1 too high	▷ In the **Control/V_G1** menu, set the parameters to a maximum of 150% of V* in the System menu.		

No.	Text	Cause	Remedy	M	S
232	V_G2 > 150% V*	Limit value V_G2 too high	▷ In the **Control/V_G2** menu, set the parameters to a maximum of 150% of V* in the System menu.		
233	V_G3 > 150% V*	Limit value V_G3 too high	▷ In the **Control/V_G3** menu, set the parameters to a maximum of 150% of V* in the System menu.		
251	Disc: Wrong ENC_INC	Invalid value for motor rotary encoder resolution	▷ Correct **Encoder & BC/ENC_INC** in the menu.	•	
280	Dec.path too long	Calculated deceleration path for travelling speed V_3 to standstill S30 is too long.	▷ Increase parameter in the **Decelerate/A_NEG** menu. ▷ Reduce the parameters in the **Decelerate/R_NEG1** and **R_NEG2** menu. ▷ Reduce the parameter in the **Drive/V_3** menu.		
281	Encoderless: Pos.Mode?	Operation without motor rotary encoder in conjunction with CAN position mode or DCP04 control is not allowed.	▷ Configure the parameter in the **Control/CONFIG=DCP03** menu. ▷ Change the control type in the elevator control to CAN Velocity mode.	•	
284	CC_OFF is on	Travel curve computer is switched off	▷ Parametrise the **ZA-Internal/CC_OFF=OFF** menu.	•	
285	System data: V*=0	In the System data V*=0	▷ Configure the parameter in the **System data/V*** menu.		
287	V_1...V_7 > V*	One of the travelling speeds V_1 to V_7 is greater than nominal speed V*.	▷ Check this in the **Travel/V_1 to V_7** menu. ▷ Check this in the **System data/V*** menu.		
289	V_1 < V_2 < V_3	Speed values set up incorrectly	▷ Configure parameters V_1 < V_2 < V_3 in the **Travel** menu	•	
290	Paraset2 empty	Parameter set 2 not preset before activation	▷ Configure the **Parameter set 2/F_PAR2** menu.		

3xx Error before start of travel

No.	Text	Cause	Remedy	M	S
303	MOP: SW error	Motor management processor error	▷ Switch frequency inverter off and then back on. ▷ Reset ZAdynpro to delivery condition: **Statistics/RESET = 77** menu ▷ Firmware update	•	•
304	MOP: HW error	▫ Overvoltage in DC-link ▫ Memory error ▫ Error in measured value recording	▷ Switch frequency inverter off and then back on ▷ Reset ZAdynpro to delivery condition: **Statistics/RESET = 77** menu ▷ Firmware update, see *Performing a firmware update, page 86*	•	•
306	ADC: Calibration?	Zero point adjustment of motor current detection outside tolerance	▷ Switch frequency inverter off and then back on.	•	•
308	Iu Iv not 0A	Current detection defective	▷ Switch frequency inverter off and then back on.	•	•

No.	Text	Cause	Remedy	M	S
310	ENC: No AWG	Motor absolute encoder not detected at start of travel	▷ Check the absolute encoder connection. ▷ Check this in the **Encoder & BC/ ENC_TYPE** menu, see *3. Rotary encoder & BC, page 37*	•	•
311	ENC:Resolution	Setting for parameter ENC_INC does not match absolute encoder resolution	▷ Check the settings in the **Encoder & BC/ENC_IN** menu, see *3. Rotary encoder & BC, page 37* For more information, see *23. INFO menu, page 60* encoder 11.		
331	ENC: Error NDEF	Faulty communication with motor absolute encoder	▷ Check this in the **Encoder &BC/ ENC_TYPE** menu. ▷ Check absolute encoder line. ▷ Check EMC-compliant installation.		•
332	ENC: 1387 CD=0	Input voltages for signal tracks C and D of the absolute encoder type ERN1387 both zero	▷ Check absolute encoder. ▷ Check absolute encoder line.		
333	ENC: Ill. counter	Determined value for the motor absolute encoder invalid	▷ Switch frequency inverter off and then back on. ▷ Check this in the **Encoder & BC/ ENC_TYPE** and **ENC_INC** menu, see *3. Rotary encoder & BC, page 37* For more information, see *23. INFO menu, page 60* encoder 11.		•
335	ENC: Warning	Motor absolute encoder warning: imminent failure	▷ Replace the absolute encoder as soon as possible. Short-term masking of the error possible, see *Mask errors, page 128*	•	•
336	ENC: Faulty	Motor absolute encoder faulty	▷ Switch frequency inverter off and then back on. ▷ Replace the absolute encoder.		•
337	ENC: Comm. Error	Faulty communication with motor absolute encoder	▷ In the **Encoder & BC** menu, check the parameters **ENC_TYPE** and **ENC_INC**. ▷ Check the absolute encoder connection. ▷ Check EMC-compliant installation. ▷ Contact the service hotline. ▷ Replace the absolute encoder.		•
340	Disc: Magnet missing	1 Magnet in the DISCcontrol positioning system not detected at the expected position.	▷ Check the position of the magnets and glue them in the correct position. ▷ Set the Hall sensor to the correct distance. ▷ Check the clearance of the traction sheave bearing.	•	•
341	Disc: No Enc. Adj.	Magnet adhesion process not completed.	▷ Carry out the magnet adhesion process in the **Encoder adjustment/ ENC_ADJ** menu.		

No.	Text	Cause	Remedy	M	S
345	ZR: Not ready	At the start of travel, the digital input parametrised to the function ZR_RDY does not receive a signal.	▷ Exit configuration level on the ZArec ▷ Check ZArec for errors. ▷ Check in the menu that **Encoder & BC/BC_TYPE = ZArec** ▷ Check wiring of frequency inverter and ZArec.		
346	BR: T2 too small	▫ Brake not detected as open at start of travel. ▫ Brake release monitoring switch does not switch	▷ Check brake release monitoring. ▷ Check brake actuation. ▷ Check brake opening time. ▷ Check in the **Start-up/T_2** menu and increase if necessary. ▷ Check the brake release monitoring parameters in the **Monitoring** and **Control** menus.	•	•
347	CO: Missing	Brake does not open	▷ Check contactor monitoring. ▷ Check the motor contactor wiring. ▷ Check the supply voltage to motor contactors. ▷ Check supply voltage to contactor monitoring. ▷ Check this in the **Monitorings/CO** menu.	•	•
348	STO: Remains	At the start of travel, the STO_A and STO_B signals are missing at the connection terminal X STO after 2.5 seconds.	▷ Check actuation wiring. ▷ Check the relay supply voltage. ▷ Check the control voltage of STO signals. ▷ When using the ZAsbc4: Switch ZAsbc4 off and then back on.		•
349	STO: No trav. sig.	After activation of the STO_A and STO_B inputs, no travel signal from the elevator control system is registered within 2.5 seconds.	▷ Check elevator control for travel signals. ▷ Check activation of the STO inputs. ▷ With parallel activation, check the wiring of the digital control inputs. ▷ Check the status of the serial actuation using the status LEDs on the frequency inverter.		
350	Temp: Sensor defective	Power unit temperature sensor not detected. Trips are only carried out with a reduced clock frequency of 3.7 kHz and maximum fan output.	▷ Contact the service hotline.	•	
355	FastStp active	Controlled emergency stop function active at the start of travel.	▷ Check the digital input settings in the **Control** menu. ▷ Check the control and wiring of the input for the **/FastStp** function.		•
360	V_EXT active	The external voltage supply at terminal X-EXT exceeds the internal voltage supply by at least 1 VDC when line voltage is present.	▷ Remove external 24 VDC voltage supply. ▷ Reduce the voltage of the external 24 VDC.	•	•

No.	Text	Cause	Remedy	M	S
365	Travel when MB = OFF	Output MB disabled, but drive is moving.	▷ Check motor brake for sufficient braking torque. ▷ Check the dropout time of the brake. ▷ Ensure the motor brake is actuated at the same time as the relay for the MB output function is switched.	•	•
370	Suspension means warning	Travel direction change counter information: The suspension means must be replaced in approx. 1 year.		•	
374	P1P2: Short circuit	The measured resistance at the X-MT terminal is less than 20 ohm when P1P2 = PTC motor temperature monitoring is set in the Monitoring menu.	▷ Check motor temperature monitoring connection. ▷ Check this in the **Monitoring/P1P2** menu.	•	
375	MOT: Temp. warning	The motor temperature is too high at the start of travel.	▷ Let the motor cool down. ▷ Check the connection of the temperature sensor to terminal X-MT. ▷ Eliminate the cause of the overheating, e.g. reduce the on time, check the system load ratios and motor parameters, motor cooling. Synchronous motors: Calibration of absolute encoder.	•	
377	BRxx: Temp. warning	Calculated power loss of brake resistor exceeds nominal power by 25%.	▷ Check **Encoder & BC/BC_TYPE** in the menu. If **Encoder & BC/BC_TYPE = BRxx**in the menu, check parameters R_BR and P_BR. ▷ Remedy the cause of the resistor overload, e.g. reduce on time, check the load ratios in the system.		
378	MP: Not active	The power unit voltage supply was not active at the start of travel.	▷ Contact the service hotline.		•
379	MP: Temp. warning	Temperature of power unit too high at start of travel.	▷ Check the function of the unit fans. ▷ Check the ambient temperature. ▷ Eliminate the cause of the overheating, e.g. reduce the on time, check the system load ratios and motor parameters. Synchronous motors: Calibration of absolute encoder.	•	
380	BR: Start fault	At least one brake is detected as released before the start of travel when brake release monitoring is activated.	▷ In the **Monitoring/BR** menu, check the number and switching logic NO/NC for the monitoring contacts. ▷ Check monitoring contact connection. ▷ Check the function of the monitoring contacts.		•
395	MP: ERR_ EXT active	Internal device error at start of travel.	▷ Switch frequency inverter off and then back on. ▷ Contact the service hotline.	•	•

4xx Error

- Interruption of travel to protect the frequency inverter
- Voltage monitoring
- Brake resistor or brake chopper overvoltage
- Power unit temperature measurement
- Current monitoring

No.	Text	Cause	Remedy	M	S
410	ADC: Overcurrent	Motor overcurrent detected	▷ Check motor connection for short circuit and earth faults. ▷ Check the phase sequence of the motor connection U->U; V->V; W->W. ▷ Check the connection and function of the absolute encoder, see *3. Rotary encoder & BC, page 37* ▷ Check calibration of absolute encoder ▷ Check the motor data in the **Motor name plate** menu. ▷ Decrease the parameter in the **Control/ SPD_KP** menu. ▷ Decrease the parameter in the **Start-up/K_ START** menu.		•
412	MOT: UVW missing	Motor test current not reached at start of travel.	▷ Check the motor connection and motor cable. ▷ Contact the service hotline.		•
415	MOT: Fault current UVW	Sum of currents U, V, W not equal to 0	▷ Check motor connection for short circuit and earth faults.	•	•
420	MP: Temp. alarm	Power unit overtemperature	▷ Check the function of the unit fans. ▷ Check the ambient temperature. ▷ Eliminate the cause of overheating, e.g. reduce the on time, check the system load ratios, check the motor parameters, check the installation spacing. Synchronous motors: Calibration of absolute encoder		•
431	MP: PWM missing	Internal device error, pulse width modulation switched off	▷ Check rotary encoder connection. ▷ Check EMC-compliant installation. ▷ Contact the service hotline.		•
450	MP: Overload	Maximum frequency inverter output current exceeded for more than 10 s	▷ Check connection and function of rotary encoder. ▷ Check the motor data. ▷ Check the weight balance. ▷ Check calibration of motor absolute encoder. ▷ Check the required motor power and unit size. ▷ Check that the cabin and counterweight engage easily.	•	•

No.	Text	Cause	Remedy	M	S
451	MP: Overload	Output current at very low speed greater than 130% for 1 s	▷ Check the system for mechanical blockage. ▷ Check connection and function of absolute encoder, see *23. INFO menu, page 60* encoder 11. ▷ Check the motor data. ▷ Check the weight balance. ▷ Check brake opening on motor. ▷ Check calibration of absolute encoder. ▷ Check the required motor power and unit size.	•	•
452	MP: Overload	IIt monitoring: Output current too high. At low speeds and large deviations between the set speed and the actual speed, the current is weighted higher	▷ Check that the cabin and counterweight engage easily. ▷ Check connection and function of absolute encoder, see *23. INFO menu, page 60* encoder 11. ▷ Check the motor data. ▷ Check the weight balance. ▷ Check motor brake opening. ▷ Check calibration of absolute encoder. ▷ Check the required motor power and unit size.	•	•
471	DC: U > UDC_ MAX	During travel, the DC-link voltage exceeded the maximum voltage.	▷ Check connection, function and design of brake resistor or brake chopper. ▷ Check this in the **Power unit/UDC_MAX** menu. ▷ Check **Encoder & BC/BC_TYPE** in the menu. ▷ If the speed control oscillates, check this in the **Control/SPD_KP** menu. ▷ If the error occurs during deceleration, reduce the **A_NEG** parameter or increase **R_NEG1** in the **Deceleration** menu.	•	
480	MP: Overcurrent	Overcurrent detected at the motor output	▷ Check motor connection for short circuit and earth faults. ▷ Check phase sequence of the motor connection: U=U; V=V; W=W ▷ Check absolute encoder connection and function. ▷ Check calibration of absolute encoder. ▷ Check the motor data in the Motor name plate menu. ▷ Decrease the parameter in the **Control/ SPD_KP** menu. ▷ Decrease the parameter in the **Start-up/K_ START** menu.		•
484	MP: Overcurrent R	Overcurrent detected at the output for the brake resistor.	▷ Check the brake resistor connection for short circuit and earth faults. ▷ Check brake resistor type.		•

No.	Text	Cause	Remedy	M	S
485	Intermediate circuit overcurrent	The DC-link current sensor has detected overcurrent	▷ Check the brake resistor connection for short circuit and earth faults. ▷ Check brake resistor type. ▷ Check motor connection for short circuit and earth faults. ▷ Check rotary encoder connection. ▷ Disconnect the cables at terminals U, V, W and R and send a travel signal. Error message still = device defective. Contact the service hotline.		•
488	MP: Current measurement	Overcurrent detected before travel	▷ Contact the service hotline.		

5xx Error

- Interruption of travel to protect the system
- Speed monitoring
- Monitoring of STO function
- Contactor monitoring optional
- Brake resistor or brake chopper monitoring
- Motor temperature monitoring

No.	Text	Cause	Remedy	M	S
503	No Enc. signal	After expiry of the time T_ENC in the Monitoring menu, no rotary encoder signal has been detected at the motor.	▷ Check brake opening. ▷ Check this in the **Monitoring/T_ENC** menu. ▷ Observe the value Cnt in the **INFO menu** when turning the motor shaft, e.g. by releasing the brake. As the shaft turns, the value must continuously rise or fall. ▷ Check rotary encoder connection. ▷ In the **Encoder & BC** menu, check the **ENC_TYPE** parameter.	•	•
504	ENC: Sig.Inter.	No signals from the rotary encoder on the motor are detected during travel.	Motor shaft rotating continuously: ▷ Check rotary encoder connection. ▷ Observe the value Cnt in the **INFO menu** when turning the motor shaft, e.g. by releasing the brake. As the shaft turns, the value must continuously rise or fall. Motor shaft stops during travel: ▷ Check whether brake has engaged during travel. ▷ Asynchronous motors: Check the motor data. ▷ Check the motor connection: U=U, V=V, W=W ▷ Increase the parameter in the **Control/ SPD_KP** menu.	•	•

No.	Text	Cause	Remedy	M	S
505	No motor movement	No signals detected from the rotary encoder on the motor.	▷ Check that the brake opens. ▷ Check the motor data. ▷ Check the motor connection: U=U, V=V, W=W ▷ Increase the parameter in the **Control/ SPD_KP** menu.	•	•
513	Movement during start	Unexpected large movement of motor shaft during start-up.	▷ Synchronous motors: Check absolute encoder offset ▷ Check the motor connection: U=U, V=V, W=W ▷ Check rotary encoder connection ▷ Check this in the **Control/SPD_KP** menu ▷ Check the motor data in the **Motor name plate** menu.	•	•
515	v > 105% V*	Speed is above 110% of the nominal speed V*	▷ Check in the **Control/SPD_KP** menu and increase if necessary. ▷ Check the motor data in the **Motor name plate** menu.	•	
516	v > 150% V*	Speed is above 150% of the nominal speed V*	▷ Check in the **Control/SPD_KP** menu and increase if necessary. ▷ Check the motor data in the **Motor name plate** menu.		•
520	Wrong direction	Drive moves several centimetres in the wrong direction	▷ Check the motor connection: U=U, V=V, W=W ▷ Check the motor data in the **Motor name plate** menu. ▷ Check rotary encoder connection. ▷ Check this in the **Control/SPD_KP** menu. ▷ Increase the parameter in the **Motor nameplate/M_MAX** menu. ▷ Swap the wires of the motor cable at connection terminals U and V and perform encoder calibration for synchronous drives: **Encoder calibration/ENC_ADJ.** menu	•	•
525	ENC: ADC Limit	Signal track A, B, C or D of absolute encoder or sinus encoder has exceeded the allowed limit value during travel.	▷ If a rectangular rotary encoder is connected in the **Encoder & BC ENC type = TTL sine** menu, check parameters. ▷ Check if the connected rotary encoder is supported by the frequency inverter. ▷ Replace the rotary encoder.	•	•
528	Quickst. not allowed	▫ Travel with quickstart during operation with UPS. Holding speed at 0 in operating mode due to limited UPS power is not allowed. ▫ Travel with quickstart not possible in SCIM operation.	▷ Switch off quickstart in the control system. ▷ In the menu, check **Parameter set2/F_ PAR2**.	•	•

No.	Text	Cause	Remedy	M	S
529	Quickstart alarm	In the quickstart function, the drive moves by more than 7 mm while speed 0 m/s is actuated.	▷ Check the motor data in the **Motor name plate** menu. ▷ Check this in the **Control/SPD_KP** menu. ▷ Check the motor connection: U=U; V=V; W=W	•	•
530	STO: Remains	At the start of travel, the STO_A and STO_B signals are missing at the connection terminal X STO after 2.5 seconds.	▷ Check actuation wiring. ▷ Check the relay supply voltage. ▷ Check the control voltage of STO signals. ▷ When using the ZAsbc4: Switch ZAsbc4 off and then back on	•	
531	STO: Interruption	▫ STO input signals interrupted during travel. ▫ Interruption of travel when signal interrupted for longer than 200 ms. No interruption of travel in the event of shorter interruptions, but error entry at the end of travel.	▷ Check the safety circuit. ▷ Check activation of the STO inputs. ▷ Check the relay supply voltage. ▷ Check the control voltage of STO signals.	•	
532	STO: Missing	At the end of travel there is still a signal at the STO_A and STO_B inputs after 2.5 s.	▷ Check activation of the STO inputs. ▷ Adjust the time during which the STO inputs are actuated in the elevator control.	•	•
533	STO: Failure	STO_A and STO_B signals different for longer than 120 ms.	▷ Check activation of the STO inputs. ▷ Check the switching function of the relay contacts. ▷ Check coupling relay actuation.	•	•
534	STO: No trav. sig.	After activation of the STO_A and STO_B inputs, no travel signal from the elevator control system is registered within 2.5 s.	▷ Check elevator control for travel signals. ▷ Check activation of the STO inputs. ▷ With parallel activation, check the wiring of the digital control inputs. ▷ Check the status of the serial actuation using the light diodes on the frequency inverter.	•	
535	ZR: RDY inter.	ZArec error message: Signal at the digital input set to ZR_RDY drops out during travel.	▷ Check ZArec for errors. ▷ Check EMC-compliant installation.		•
536	SBC: RDY inter.	Digital input with the SBC_RDY function is de-energized during travel or is not set at the start of travel.	▷ See ZAsbc4 operating instructions	•	•
539	Error while STO on	Group fault due to STO interruption	▷ Check the safety circuit. ▷ Check activation of the STO inputs. ▷ Check the relay supply voltage. ▷ Check the control voltage of STO signals.	•	

No.	Text	Cause	Remedy	M	S
541	MD_BM: Error	▫ Brake actuation not ready at start of travel. ▫ Brake actuation still ready at end of travel.	▷ For devices of type MDxxBR, check voltage between N_SC and L_SC during start-up. Set **Control/f_O3 = RB** in the menu. ▷ For all other devices, the input function 51:MD_BM_Fb must not be set. ▷ Contact the service hotline.	•	•
544	CO/RF:Vx active	Interruption of travel due to CO interruption, the travel commands from the control remain active.	▷ Check the safety circuit. ▷ Check contactor actuation. ▷ Use the control to check the evaluation of the frequency inverter output signals.	•	
545	CO: Interruption	Interruption of travel due to CO interruption	▷ Check the safety circuit. ▷ Check contactor actuation.	•	
548	CO: Stays ON	At the end of travel, the contactors are not detected as de-energized when the time T_CDLY in the Monitoring menu has elapsed.	▷ Check the wiring of the contactor monitoring. ▷ Check contactor actuation. ▷ Check the function of the contactors.	•	•
550	MOT: Overload	Motor current exceeds the value I_MAX for the time T_MAX in the Monitoring menu.	▷ Check the motor data in the **Motor name plate** menu. ▷ Check the weight balance. ▷ Check brake opening. ▷ Check system layout.	•	•
552	Disc:EncInc deviation	Encoder line count determined has an excessively high tolerance	▷ Check the friction wheel, e.g. support, bearing, diameter. ▷ Switch frequency inverter off and then back on. ▷ Permanent: Contact the service hotline.	•	•
553	Disc: Wrong pos.	Magnet detected in unexpected position	▷ Check the position of the magnets. ▷ Switch frequency inverter off and then back on.	•	•
560	V > VZ	During travel at the actuated speed V_Z, the speed was 10% higher than the setpoint speed. Only active with entry in the negative error mask, see menu **Monitoring/ MSK_NEG**.	▷ Check the parameters in the **Motor name plate** menu. ▷ In the **Control** menu, check the parameters **SPD_KP** and **SPD_TI**.	•	•
565	Movement detected	The motor shaft moved during absolute encoder adjustment with closed brake.	▷ Check that the brake has been disconnected from the start. The brake must not open during adjustment.	•	
570	PFU: Alarm	The monitoring contact for the power recuperation unit, input BC, opens during operation or is not closed during start-up.	▷ Check the power recuperation unit error display. ▷ Check the connection of the alarm relay for the power recuperation unit.	•	•

No.	Text	Cause	Remedy	M	S
575	Mot: Temp. alarm	Motor temperature higher than limit value during travel. Only active with entry in the negative error mask, see menu **Monitoring/ MSK_NEG**.	▷ Check the parameters in the **Motor name plate** menu. ▷ In the **INFO menu Mot 04**, check the motor current during constant downward travel with an empty cabin. Motor current must not exceed the nominal current of the motor. For asynchronous motors: carry out automatic identification of the motor parameters in the **Motor name plate/ASM_ID** menu. ▷ Check the motor on time: **INFO menu Power1**, value ED. ▷ Synchronous motors: Calibrate the absolute encoder, see *Calibrating the rotary encoder for synchronous motors, page 99* ▷ Check the brake opening.	•	•
582	BR: T2 too small	▫ Brake not detected as open at start of travel. ▫ Brake release monitoring switch does not switch.	▷ Check brake release monitoring. ▷ Check brake actuation. ▷ Check brake opening time. ▷ Check in the **Start-up/T_2** menu and increase if necessary. ▷ Check the brake release monitoring parameters in the **Monitoring** and **Control** menus.		
583	BR: Travel error	Brake monitoring triggered during travel. Only active with entry in the negative error mask, see menu **Monitoring/ MSK_NEG**.	▷ Check the function of the monitoring contacts. ▷ Check brake actuation. ▷ Check the brake supply voltage.	•	
584	BR: Travel error	Brake monitoring has tripped during travel: ▫ For a brief interruption, entry at the end of travel ▫ For interruption longer than 500 ms, interruption of travel	▷ Check the function of the monitoring contacts. ▷ Check brake actuation. ▷ Check the brake supply voltage.	•	•
585	BR: T5 too small	Brake has not closed within T_5.	▷ Check brake actuation. ▷ Check that the brake closes. ▷ In the menu **Stop/T_5**, increase if necessary. ▷ Check the switching function of the brake monitoring.	•	•
587	BR: Delta t too small	In the event of an emergency stop, the brakes are not applied with a time delay of at least 50 ms.	▷ Carry out brake actuation according to the instructions for the drive with free-running diode in a brake circuit. ▷ Check existing free-running diode for defects.	•	•

No.	Text	Cause	Remedy	M	S
590	RV1/RV2: Change	Direction specification changed during travel. Only active with entry in the negative error mask, see menu **Monitoring/ MSK_NEG**.	▷ Check travel direction actuation. ▷ Check EMC-compliant installation.	•	•
599	Fan defect	Main fan feedback signal not detected	▷ Check voltage supply for terminal L/N fan. ▷ Remove blockages in the impeller. ▷ Switch the frequency inverter off and on again, including a voltage reset at terminal L/N. ▷ Contact the service hotline.	•	•

7xx - 8xx errors

- Interruption of travel due to communication errors between frequency inverter and control
- Error during operation with CANopen Lift

If an error occurs during CAN operation, the frequency inverter runs through status ST_Delay and goes to status Check ST release until the control sends the command Fault Reset.

No.	Text	Cause	Remedy	M	S
710	DCP: Timeout	DCP communication interrupted during travel.	▷ Check the wiring of the DCP connection. ▷ Ensure DCP line screening. ▷ Sporadic: Check EMC-compliant installation. ▷ Check the counter readings of the fault counters in the **INFO menu Bus INFO 4**. ▷ Check the DCP interface in the control.		•
715	DCP: G0-G7 missing	DCP telegram for speed specification G0 to G7 not sent by control.	▷ Check compatibility of the control with the DCP specification.	•	•
720	Extends while decel.	DCP: DCP04 remaining distance transmitted during deceleration increased CAN: new target position specified during deceleration	▷ Check the absolute encoder for determination of the remaining distance. ▷ Check compatibility of the control with the DCP specification. ▷ In the **INFO Bus Info 3** menu, check the ratio of the distance measurement on the shaft absolute encoder to the motor encoder in line 4.	•	•
721	DCP: Remaining distance error	No change to remaining distance specification during travel	▷ Check compatibility of the control with the DCP specification. ▷ Check the absolute encoder for determination of the remaining distance.	•	•

No.	Text	Cause	Remedy	M	S
780	Quickstart > 20s	Travelling speed V=0 over 20 s during quickstart.	▷ Reduce the time period in which V=0 is actuated.	•	•
781	Quickstart during travel	The signal at the digital input configured for V=0 is activated during travel.	▷ Check actuation of V=0.	•	•
799	RF: Interruption	The signal at the digital input configured for the controller enable RF function switched off during travel. Only active with entry in the negative error mask, see menu **Monitoring/MSK_NEG**.	▷ Check actuation of RF. ▷ Check the safety circuit.	•	
800	CAN: Timeout	Velocity mode: Heartbeat from the control missing or not received during the set time period. Position mode: Heartbeat from the control and/or shaft absolute encoder missing or not received during the set time period.	▷ Check CAN connections ▷ Check devices for set heartbeat.		•
820	CAN: Control val. wrong	The control is sending CAN control words at an impermissible time or in the wrong sequence	▷ Check that the control has the latest software version.	•	•
821	CAN: Position error	During travel at more than 10 cm/s, the shaft position does not change within 200 ms.	▷ Check the CAN absolute encoder in the shaft. ▷ Check the traction conditions of the drive on the traction sheave. Blocking in the event of 5 consecutive errors. Reverse block: in the **Monitoring/UNLOCK=ON** menu	•	•
831	CAN:Timeout dis. op.	The control does not issue the Disable Operation command within the time T_CMD entered in the Control menu when stopping.	▷ Check the time in the **Control/T_CMD** menu. ▷ Check compatibility of the control with the CAN specification CiA-417. ▷ Check the fault counter for changes during travel in the **INFO Bus Info 4** menu. ▷ Check for EMC-compliant installation and termination of the CAN bus.		•

No.	Text	Cause	Remedy	M	S
832	CAN:Timeout Shutdown	The control system does not issue the Shutdown command within the time T_CMD in the Control menu when stopping.	▷ Check the time in the **Control/T_CMD** menu. ▷ Check compatibility of the control with the CAN specification CiA-417. ▷ Check the fault counter for changes during travel in the **INFO Bus Info 4** menu. ▷ Check for EMC-compliant installation and termination of the CAN bus terminating resistors.		•
833	CAN:Timeout Dis.Vol.	The control does not issue the Disable Voltage command within the time T_CMD entered in the Control menu when stopping.	▷ Check the time in the **Control/T_CMD** menu. ▷ Check compatibility of the control with the CAN specification CiA-417. ▷ Check the fault counter for changes during travel in the **INFO Bus Info 4** menu. ▷ Check for EMC-compliant installation and termination of the CAN bus terminating resistors.		•
840	CAN: Enc.Info missing	The Position conversion object 0x641F has not been written to the frequency inverter by the control.	▷ Check that the control has the latest software version.		•

9xx Serious error

The errors are acknowledged by a restart.

No.	Text	Cause	Remedy	M	S
903	SIO not synchronous	When switching on, internal communication between the processors is faulty, the device performs a reset and restarts.	▷ Firmware update ▷ Permanent: Contact the service hotline.	•	•
905	MOP: HW/SW error	An error occurred after switch-on. The frequency inverter switches to Wait-Switch off after 60 s and must be switched off.	▷ Switch frequency inverter off and then back on ▷ Permanent: Contact the service hotline.	•	•
906	ZR: Error at start	If the Encoder & BC BC_TYPe= ZArec, PFU or PFU+BRxx, no signal is present at the BC input when switched on.	▷ Check wiring. ▷ Check **Encoder & BC/BC_TYPE** in the menu. ▷ Check power recuperation unit for fault-free operation. ▷ ZArec: Check BR with temperature contact connection. Check the BR without temperature contact to see if the temperature monitoring input to ZArec is bridged. ▷ Switch frequency inverter off and then back on.	•	•

No.	Text	Cause	Remedy	M	S
907	PFU: BR alarm	At the digital input programmed with the function PFU_BR, the signal for temperature monitoring of the brake resistor drops in the 2nd parameter set during travel.	▷ Check brake resistor for overheating. ▷ Check the wiring of the brake resistor thermal contact. ▷ Switch frequency inverter off and then back on.		•
908	PFU: Error at start	When switching on, the monitoring contact for the power recuperation unit is not closed.	▷ Check power recuperation unit for fault-free operation. ▷ Check the field of rotation line connection for the power recuperation unit. ▷ Check the power recuperation unit function monitoring connection at the digital input BC. ▷ Switch frequency inverter off and then back on.		•
910	BC/BR: ERR at start	When switching on, the monitoring contact of the brake resistor or brake chopper is not closed.	▷ Check the connection and functionality of the temperature monitoring for the brake chopper or brake resistor. ▷ Check whether there is a voltage of 24 VDC at the connection terminal X-IN between +24V_IN and GND_IN. ▷ Check this in the **Encoder & BC/ BR_TYPE** menu. ▷ Switch frequency inverter off and then back on.		•
911	BRxx: Overload	Average braking performance of the last 120 s has exceeded 200% of the nominal power set for the brake resistor	▷ Check this in the **Encoder & BC/ BR_TYPE** menu. If **Encoder & BC/BR_ TYPE=BRxx**, check the power set in parameter P_BR. ▷ Check the brake resistor design. ▷ Switch frequency inverter off and then back on.	•	•
912	BC: Alarm/failure	The monitoring contact for the brake chopper or brake resistor opens during travel	▷ Check the connection and functionality of the temperature monitoring. ▷ Check the brake resistor design ▷ Switch frequency inverter off and then back on.		•

No.	Text	Cause	Remedy	M	S
913	DC: U_DC> U_BC	When at a standstill, the internal measured voltage at the DC-link is higher than the engagement voltage of the brake chopper	▷ **DANGER!** Danger to life due to high electrical voltage: Compare the displayed value U_DC in the **INFO Brake Chopper 07** menu with the measured value at the DC+ and DC- terminals. If the voltage displayed deviates by more than 5%, there is a defect in the device. If the measured voltage is greater than 620 V, the line voltage is not compliant with the standards. ▷ Check the supply voltage between the supply phases: max. value = 440 VAC ▷ Synchronous motors: make sure that the shaft does not rotate when at a standstill. ▷ Switch frequency inverter off and then back on.	•	•
914	Encoder missing	No rotary encoder detected when switching on.	▷ Check rotary encoder connection. ▷ Check this in the **Encoder &BC/ ENC_TYPE** menu. ▷ Switch frequency inverter off and then back on.	•	•
917	BRxx active	The internal transistor for the brake resistor is still activated 5.5 s after end of travel	▷ **DANGER!** Danger to life due to high electrical voltage: Compare the displayed value U_DC in the **INFO Brake Chopper 07** menu with the measured value at the DC+ and DC- terminals. If the voltage displayed deviates by more than 5%, there is a defect in the device. If the measured voltage is greater than 620 V, the line voltage is not compliant with the standards. ▷ Check the supply voltage between the supply phases: max. value = 440 VAC ▷ Synchronous motors: make sure that the shaft does not rotate when at a standstill. ▷ Switch frequency inverter off and then back on.	•	•
919	ZR: BC error	ZArec: Signal at the digital input BC missing	▷ Check ZArec for error message. ▷ Switch frequency inverter off and then back on.		•
920	Overcurrent standst.	Overcurrent at standstill	▷ Brake chopper: Check wiring. ▷ Check for EMC-compatible installation. ▷ Permanent: Contact the service hotline.		•

No.	Text	Cause	Remedy	M	S
931	Internal error	Internal device error	▷ Switch frequency inverter off and then back on. ▷ Permanent: Contact the service hotline.		•
935	MP: PWM on	Internal device error	▷ Permanent: Contact the service hotline.		•
950	TD_CNT: Limit	Maximum number of travel direction changes reached.	▷ Replace suspension means and reset counter. Until the suspension means are replaced, travel is possible after switching the frequency inverter off and back on again.		•
960	STO: Diagnostics	STO_A and STO_B signals different for longer than 310 ms: Frequency inverter locked by internal hardware diagnostics.	▷ Check activation of the STO inputs. ▷ Reset the error by switching off the frequency inverter.		•
961	STO: Hardware	Hardware error in the STO diagnostics	▷ Contact the service hotline.	•	•
962	STO: HW standstill	Internal diagnostic unit has detected faulty signal status.	▷ Switch frequency inverter off and then back on. ▷ Contact the service hotline.		•
963	STO: Hardware start	Internal diagnostic unit has detected faulty signal status.	▷ Make sure that the device is not overheated. ▷ Switch frequency inverter off and then back on. ▷ Permanent: Contact the service hotline.		•
964	STO: Hardware stop	Internal diagnostic unit has detected faulty signal status.	▷ Switch frequency inverter off and then back on. ▷ Permanent: Contact the service hotline.		•
970	DC: U < UDC_MIN	The DC-link voltage has fallen below the limit value for the minimum voltage during travel.	▷ **DANGER!** Danger to life due to high electrical voltage: Check the voltage of the 3 phases of the power supply. ▷ In the **Power unit/UDC_MIN** menu, check: Factory setting: 450 V ▷ Check the mains connection, e.g. line voltage, cable cross-section, line reactor design, mains impedance.		•
972	Phase failure	Phase failure during motor travel, reset triggered.	▷ **DANGER!** Risk of death due to high voltage: Check 3 phases of the supply voltage: Measure L1, L2, L3 to PE.		•

No.	Text	Cause	Remedy	M	S
975	DC: U > 850V	The DC-link voltage rises to more than 850 VDC during travel or when at a standstill	▷ Check this in the **Decelerate/A_ NEG** menu and reduce if necessary. ▷ Check connection and functionality of brake resistor or brake chopper. ▷ **DANGER!** Danger to life due to high electrical voltage: Compare the displayed value U_DC in the **INFO Brake Chopper 07** menu with the measured value at the DC+ and DC- terminals. If the voltage displayed deviates by more than 5%, there is a defect in the device. If the voltage displayed deviates by more than 5%, there is a defect in the device. If the measured voltage is greater than 620 V when at a standstill, the line voltage is not compliant with the standards. ▷ Switch frequency inverter off and then back on.		•
976	STO: Temp. alarm	Temperature in the area of the STO safety circuit > 75 °C.	▷ Check the function of the unit fans. ▷ Ensure ambient temperature is < 55 °C. ▷ Switch frequency inverter off and then back on.		•
980	SW error (zm)	Internal error, unknown state	▷ Switch frequency inverter off and then back on. ▷ Firmware update ▷ Permanent: Contact the service hotline.		•
981	SW error (zm cc)	Internal error, unknown travel curve computer state	▷ Switch frequency inverter off and then back on. ▷ Firmware update ▷ Permanent: Contact the service hotline.		•
982	SW error (T > 4.5ms)	Internal error, maximum cycle time for internal calculations almost reached	▷ Firmware update ▷ Permanent: Contact the service hotline.		•
983	Internal error	Internal error	▷ Firmware update ▷ Permanent: Contact the service hotline.	•	•
988	ADC timeout	Internal error	▷ Firmware update ▷ Permanent: Contact the service hotline.	•	•
990	SW error (stacktop)	Internal error	▷ Firmware update ▷ Permanent: Contact the service hotline.		•

No.	Text	Cause	Remedy	M	S
991	SIO: Timeout	Communication between the motor management processor MOP and the application processor APP interrupted	▷ Check EMC-compliant installation. ▷ Contact the service hotline.		•
994	MOP: Timeout 2	Communication between the motor management processor MOP and the application processor APP interrupted when at a standstill	▷ Check EMC-compliant installation. ▷ Contact the service hotline.		•
997	SW error (MOP)	Internal motor management processor MOP error	▷ Firmware update ▷ Permanent: Contact the service hotline.		•

Information text

Information texts are displayed for 2 seconds.

Information text	Cause	Remedy
CO interruption	▫ The motor contactors are opened at speeds V4 to V7 during non-distance-dependent travel. ▫ Motor contactors opened during stopping operation before timer T_5b has elapsed. For the number of CO interruptions, see the **Statistics/SCO** menu.	Regular occurrence during normal travel: Setting problem. ▷ Check the switch-off time of the motor contactors, see control.
RF interruption	▫ Controller enable signal RF deactivated during travel. ▫ During a stopping operation, the controller enable signal RF is deactivated before the timer T_5b has elapsed. For the number of RF interruptions, see the **Statistics/SRF** menu.	Regular occurrence during normal travel: Setting problem. ▷ Check the switch-off time of the motor contactors, see control.
s1 = 0 cm	During the distance-dependent deceleration phase from travelling speed V2 or V3 to positioning speed V1, the signal for positioning speed V1 is deactivated.	
Attention! n*>n	Calculated speed n* greater than speed n on name plate.	▷ Check system data
Auto. travel curve presetting?	If parameter V* is changed, query: Automatic travel curve presetting?	▷ Confirm or reject
Change suspension means! Remaining travel direction changes: xxx	The suspension means used must be replaced in approx. 1 year at the latest. The remaining number of travel direction changes with the current suspension means is displayed and continuously updated. Calculation is based on previous utilisation. Any change to utilisation following output of the notice will not be taken into account.	▷ Confirm notice with ESC key

11.5 Operating states

The firmware of the ZAdynpro divides the travel curve into multiple ranges. Each range has a status number with an operating state. The operating states are displayed in the **INFO/Page02** menu with a status number and plain text, see *23. INFO menu, page 60*.

No.	Text	Explanation
0	Start system	System start
1	Init system	Hardware initialisation
10	Check supply	Voltage supply check
20	Wait MOP request	Wait until communication with power unit is active
21	Check SW-versions	Firmware version check
22	Wait para-transfer	Parameter transmission
23	Check MOP-status	Waiting for signal processor, power unit detection
30	Check encoder	Absolute encoder check
35	Monitor	Evacuation monitor
40	Enable DC-link	Activation of DC-link voltage
41	Check PFU	BC power recuperation unit input test
42	Check input BC	BC brake resistor or brake chopper input test
50	ADC-adjustment	Current transducer calibration
55	Verify ADC-adjust.	Current transducer calibration
70	Check ADC Encoder	Power unit temperature check
80	Start fan	Start fan
90	EKS Active	Electronic short-circuit active
91	EKS Switch off	Electronic short-circuit deactivated
93	Energy saving 1	Standby 1
94	Motor temperature!	Motor overtemperature
95	R/W Para Encoder	Communication with rotary encoder
96	Para Calculation	Parameter calculation active
97	Editing parameter	Editing parameter
98	ZArec not ready	Waiting for ZArec
99	No Encoder detect!	Waiting for rotary encoder
100	Drive in waiting	System off
105	PFU Standby	Power recuperation unit on standby
107	Activate low PWM	Changing clock frequency
108	Activate norm PWM	Changing clock frequency
110	Drive selected	System ready
115	Start delay	Start delay
200	Start check	Start-up check
220	Read abs. pos.	Absolute encoder check
221	Wait for abs.pos.	Absolute encoder check
222	Wait abs.pos ready	Absolute encoder check
223	Read abs.error	Absolute encoder check
280	Wait STO off	Wait until STO deactivates
300	Wait mot-contactor	Wait until motor contactors switched on
302	C0-Delay 40ms	Delay time for motor contactor monitoring
305	Test mot-phase cur	Motor phase check
310	Magnetise step 1	Asynchronous motors: Build-up of magnetic field in the motor T1

No.	Text	Explanation
311	Magnetise step 2	Asynchronous motors: Build-up of magnetic field in the motor T1
315	Sample Enc.pos.	Absolute value check
316	Hold Enc.position	Absolute value check
319	Start controlling	Start control
320	Wait brake opened	Wait until motor brakes have opened T2
325	Quick start	Quickstart
330	Hold (Timer T3)	Accelerate motor to speed V_T3
340	Start travelling	Starting
400	SL: Get Data	Travel curve computer data transmission
410	SL: Accelerate	Acceleration after speed Vx
420	SL: Constant speed	Constant travel at speed Vx
430	SL: Constant speed	Constant travel at speed Vx
440	SL: Decel. to 0	Deceleration to speed 0m/s
460	SL: Decelerate	Deceleration to speed Vx
480	SL: Decel. to 0	Deceleration to speed 0m/s
490	SL: Quick Stop MAX	Emergency stop: Deceleration at max. acceleration
493	Mode CC_OFF = On	Mode with travel curve computer switched off
494	Runtime monitoring	Runtime monitoring
495	Simulink end	Travel curve computer end
500	Hold (Timer T4)	Keep motor at speed 0 T4
510	Wait brake closed	Wait until the motor brakes are closed T_5
515	Start abort 1s	Brake gets additional current supply for 1s
520	T5b:Decay Mot.Volt	Synchronous motors: Switch off current supply to motor T_5b
530	Wait contactor off	Wait until motor contactors switched off
535	Travel abort	Interruption of the travel due to interruption of RF controller enable
536	Travel abort by CO	Interruption of the travel due to interruption of Cox contactor monitoring
538	Wait STO on	Wait until STO activates
540	Wait for stop	Waiting until standstill
560	End of travelling	End of travel
570	Rec. trig.by norm	Recording to MMC
572	Rec. trig.by input	Recording to MMC
575	Rec. save to MMC	Recording to MMC
830	Torque Control	Torque control active
835	Torque Control Ana	Torque control active via analog input
840	Setpoint analog	Setpoint specification via analog input
851	Safety brake-mode	Capture release is active
852	Encoder-ID active	Encoder calibration is active
870	DTE Mode	Intern development mode
900	ST-blockage delay	Delay of automatic acknowledgement after elimination of fault cause 2 seconds
902	Rec. trig.by error	Recording to MMC
904	Rec. save to /ERR	Recording to MMC
907	Check UCE error	Check for overcurrent
908	ST-UCE-delay	Deceleration after overcurrent
909	Wait drivecom. Off	Waiting for travel command off

No.	Text	Explanation
910	ST-lock	Frequency inverter locked
920	Read abs.error	Reading absolute value error
930	MP-temp-alarm	Power unit overtemperature
932	Motor-temp.alarm	Motor overtemperature
940	Read HW-fault info	Read hardware error
941	Reset Err_Ext	
942	Clear UCE-Fault	Read hardware error
950	Parameter-change	Parameter change
960	Read encoder info	Read absolute value error
980	Disable DC-link	Switch off DC-link
982	Change MOT_TYP	Motor type has been changed
988	Wait reset(DIS99x)	Wait for reset
990	Input BC-fault	BC input failure
993	Overcurr. Standst.	Overcurrent at standstill
995	TD_CNT Limit	Maximum change of direction reached
996	STO Error	STO error
997	Energy saving 2	Frequency inverter is in stand-by mode
998	Wait switch Off	Wait until the frequency inverter is switched off
999	ZA Hardware Test	
1,000	-without text-	

11.6 Automatic parameter diagnostics APD

With automatic parameter diagnostics, the parameters are checked for plausibility and limit values. This function is used in cooperation with the ZIEHL-ABEGG service department if required.

Procedure:

▷ Activate the APD function in the **Statistics/APD** menu. Information that deviates from the standard information is displayed.

12 Service

Personnel qualifications: Maintenance personnel

12.1 Service plan

⚠ DANGER **Danger to life due to electric shock.**

▷ Disconnect the product from the power supply and secure it against being switched back on. Wait for at least 3 minutes.

▷ Defective components or lines must be replaced immediately regardless of the specified interval.

The maintenance intervals and cleaning intervals are dependent on the area of use, the environmental conditions and the degree of contamination of the product.

The information refers to standard conditions:

Intervals	Component	Activity
As part of recurring maintenance work	Complete product, including add-on parts and cables	▷ Perform a visual inspection and functional test. ▷ Replace defective parts immediately.
As part of recurring tests	STO safety function	▷ Test the STO safety function.

13 Taking out of operation

1. Disconnect the line voltage to the motor and secure against being switched back on.

   WARNING! Electric shock from live parts.

   ▷ Wait for 3 minutes
2. Check that there is no voltage present.
3. Disconnect all connections.

14 Disposal

▷ Dispose of the product professionally and in an environmentally friendly way in accordance with the respective national legal stipulations.
▷ Separate the materials by type and in an environmentally-friendly way.
▷ If necessary, employ a specialised contractor to handle the disposal.

15 Certificates

15.1 Declaration of Conformity A-KON16_06

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. ZAdyn4CA 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

1/2

ZIEHL-ABEGG

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)



(signature)

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



(signature)

15.2 Certificate 968/A 166.07/22

Certificate

Functional Safety

TÜVRheinland CERTIFIED

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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.

Köln, 2022-10-13

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

TÜV Rheinland Industrie Service GmbH, Am Grauen Stein, 51105 Köln / Germany
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15.3 Appendix to certificate 986/A 166.07/22

2023-02-06

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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 74653 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: STO_A – GND and STO_B – GND	typ.: 0 / 24 V DC LOW: 0 … 3 V DC HIGH: 15 … 30 V DC
		Input current: STO_A – GND and STO_B – GND	typ.: 12 mA (HIGH)
		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 Software diagnostic: (not safety relevant) Hardware diagnostic:	Max. allowed discrepancy time between STO_A and STO_B: t_v < 120 ms if t_v > 120 ms then failure indication by frequency converter 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.

Annex to Certificate Reg.-Nr.: 968/A 166.07/22 Page 1 of 3

2023-02-06

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	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.
	Operating temperature: Humidity:	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))
	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
8. Maintenance	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.	
9. Installation	The guidelines regarding installation, commissioning and operation shall be observed. - 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.	

2023-02-06

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10. Configuration	- 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.

11. Auxiliary conditions for a safe operation	- 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.
	  - 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 φ = (180 ° / 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).

15.4 210323 approval for ZAdyn direction of travel change counter

liftinstituut
SINCE 1933

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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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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15.5 Self-monitoring of motor brake NL12-400-1002-163-01

liftinstituut
SINCE 1933

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.

Certification decision by

Amsterdam

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

W.G. Kasteleijn
Product Manager Certification

16 Technical data

16.1 Technical data

Condition	Unit	Value
Degree of protection EN 60529		IP 20
Temperature during storage and transport	°C	-20 to + 60
Ambient temperature for operation	°C	0 to 55 Power reduction from 40: 1.66% per 1 K temperature increase
Relative air humidity	%	90, condensation prohibited
Mounting height above sea level.	m	maximum 2000 m Power reduction from 1000 m: 1% per 100 m
Degree of contamination EN 61800-5-1		2

	Unit	Size				
		011	013	017	023	032
Article no. with CANopen interface		352250	352251	352252	352253	352254
Article no. with DCP interface		352250 -DCP	352251 -DCP	352252 -DCP	352253 -DCP	352254 -DCP
Weight	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	

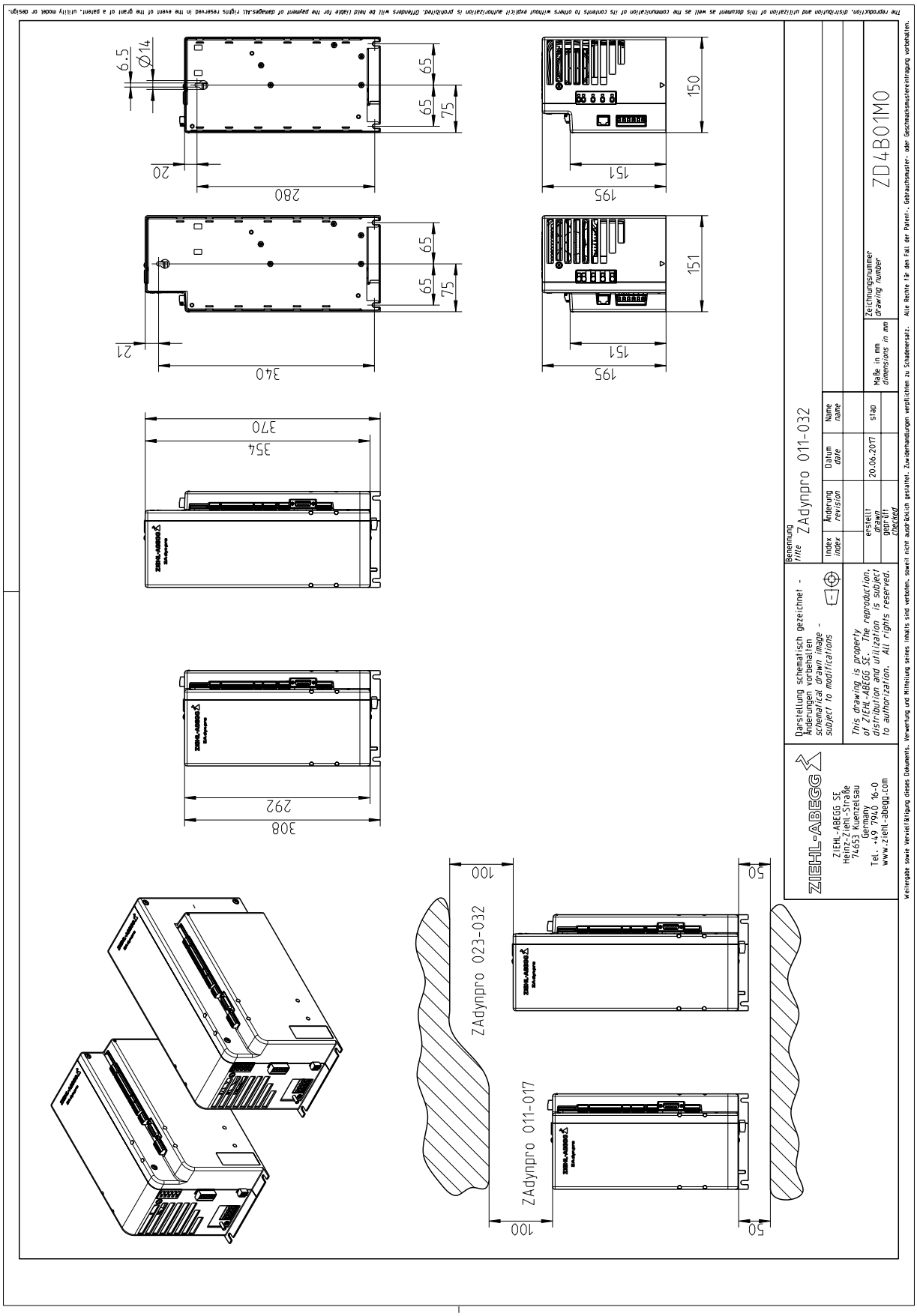
	Unit	Size			
		040	050	062	074
Article no. with CANopen interface		352255	352256	352257	352258
Article no. with DCP interface		352255 -DCP	352256 -DCP	352257 -DCP	352258 -DCP
Weight	kg	16.1	16.4	17.1	17.1
Dimensions H x W x D	mm	517 x 311 x 190			

	Unit	Size								
		011	013	017	023	032	040	050	062	074
Line connection voltage	V	3~180...440 absolute								
Mains frequency	Hz	50/60 +- 1.5								
Typical motor power 400 V	kW	4.6	5.5	7.5	11	14	19	24	30	37
On time at nominal current and clock frequency 8 kHz	%	40								
Nominal current at 40% of the on time and fixed 8 kHz clock frequency	A	11	13	17	23	32	40	50	62	74
Nominal current at 40% of the on time and fixed 12 kHz clock frequency	A	9	11	15	20	27	34	42	53	63

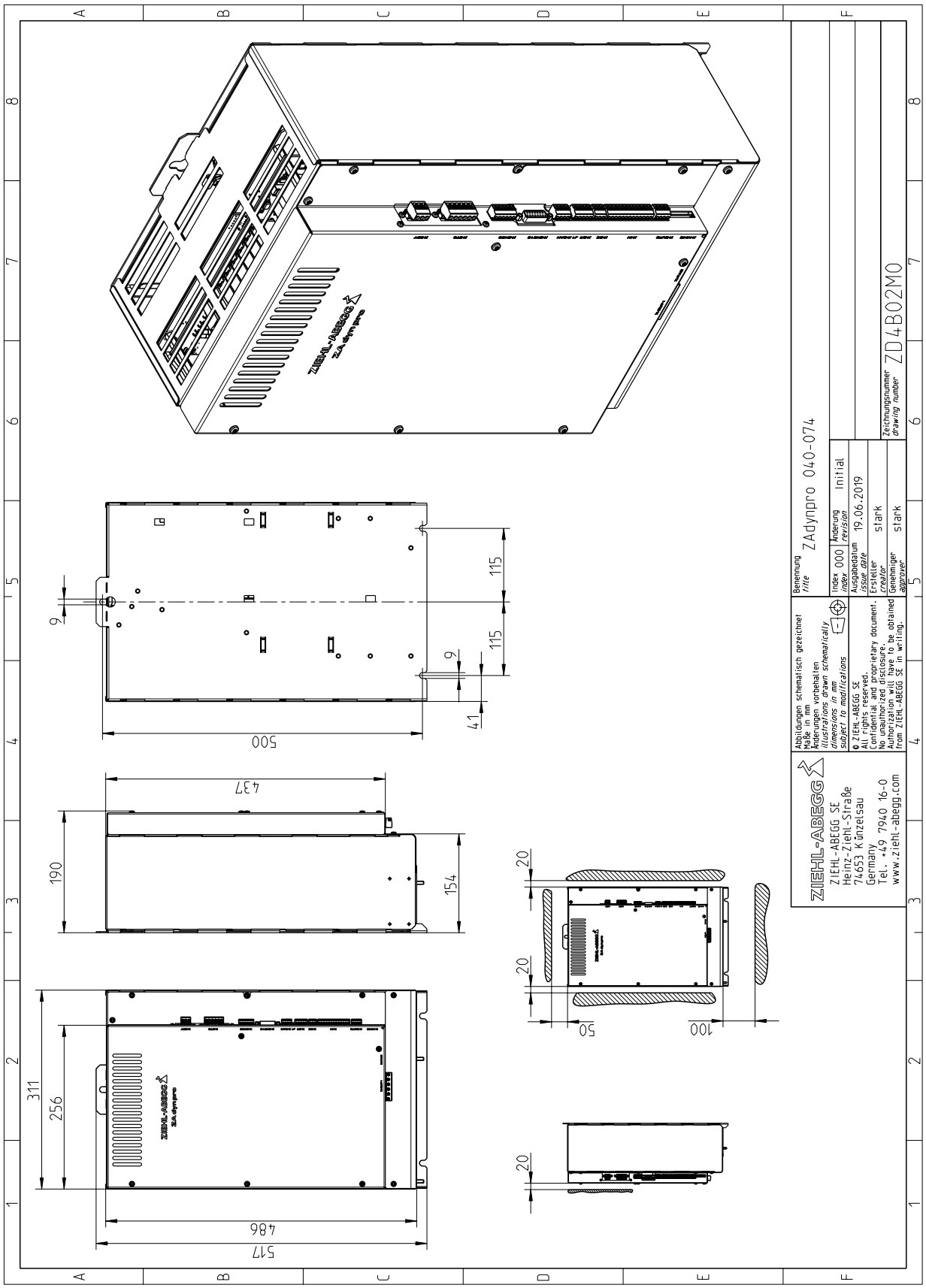
	Unit	Size								
		011	**013**	**017**	**023**	**032**	**040**	**050**	**062**	**074**
Nominal current at 40% of the on time and fixed 16 kHz clock frequency	A	8	10	13	17	23	30	38	46	55
Maximum operating current for a maximum of 10 seconds	A	20	24	31	42	58	72	90	112	134
Power loss at nominal current, 8 kHz clock frequency and 40% on time	W	140	150	190	230	300	320	410	500	610
Power loss at nominal current, 16 kHz clock frequency and 40% on time	W	220	240	300	350	430	460	580	710	850
Heat dissipation standstill	W	24	25	26	27	27	28	30	33	33
Power loss standby	W	≤ 3			≤ 6		8	10	14	14
Switching frequency	kHz	4 to 16								
Motor frequency	Hz	maximum 200								
Maximum terminal cross-section for line, motor, brake resistor, or brake chopper	mm²	with wire end sleeve: 6 without wire end sleeve: 10					with wire end sleeve: 35 without wire end sleeve: 35			

* NO power reduction with variable clock frequency **Power unit/M_PWM=AUTO** unit

16.2 ZAdynpro 011-032 dimension sheet

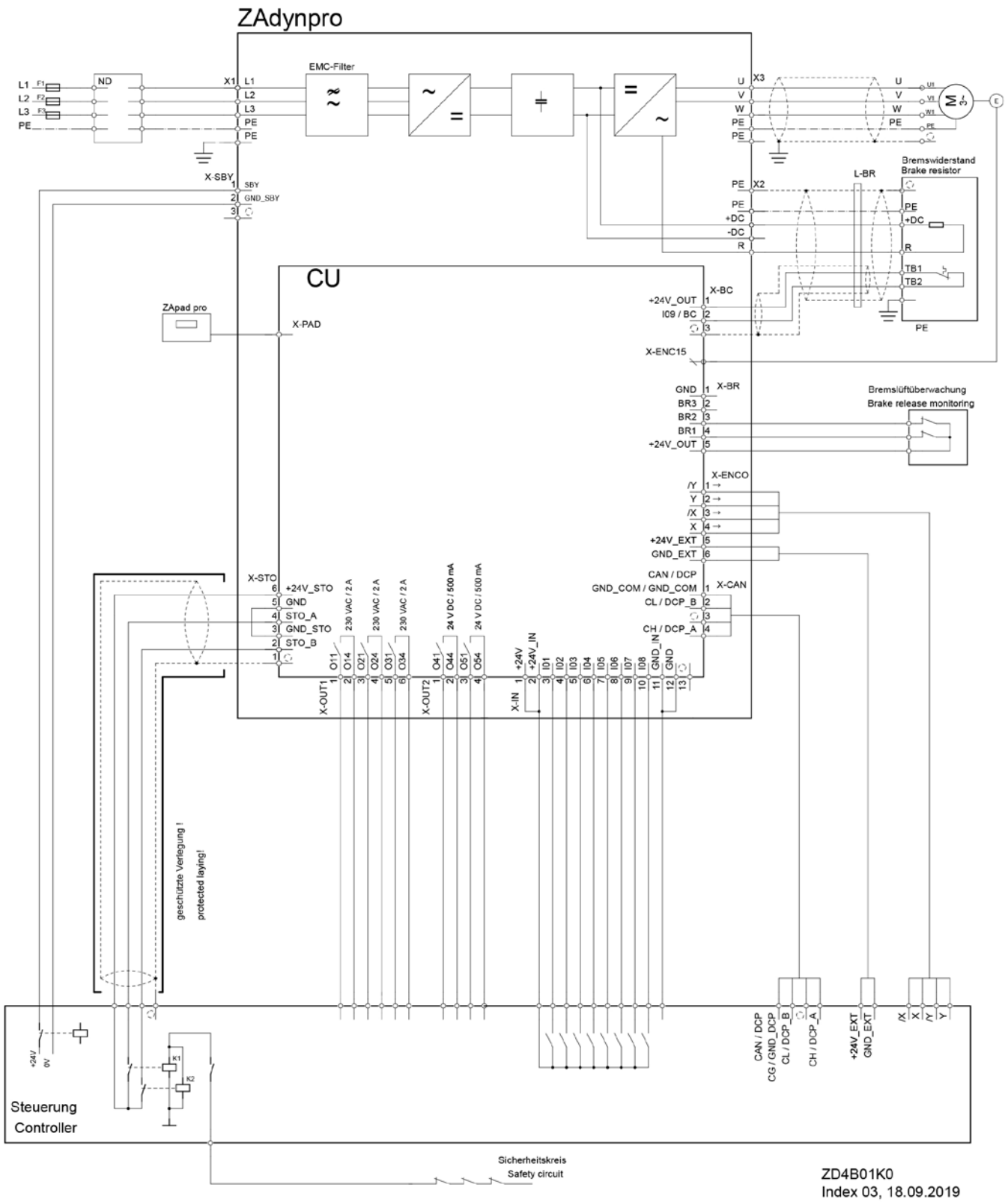


16.3 ZAdynpro 040-074 dimension sheet

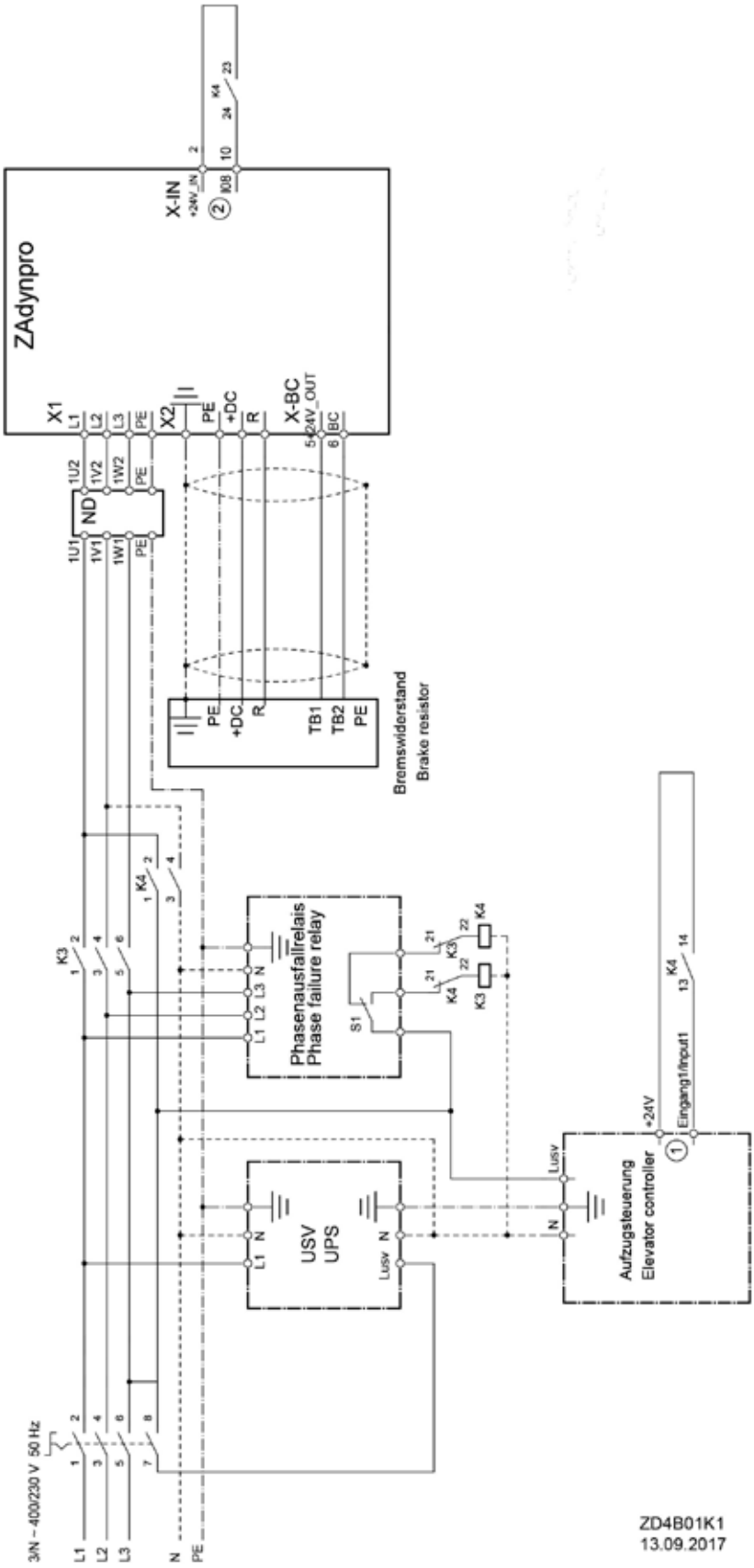


16.4 Connection diagram

Circuit suggestion for ZAdynpro



Circuit suggestion for UPS to ZAdynpro



Notes

The Royal League

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