english

ZETADYN 3BF

Frequency inverter

Operating Instructions

R-TBA05_08-GB 1206 Part.-No. 00163264-GB

ZIEHL-ABEGG

Content

1 General information

1.1 Validity

These operating instructions apply to:
Frequency inverter from the series: ZETADYN 3BF
from software version 3.38

1.2 Structure of the operating instructions

Use ZETADYN 3BFthese operating instructions to work safely with and on the device. They contain safety instructions that must be complied with as well as information that is required for failure-free operation of the device.
Keep these operating instructions together with the device. It must be ensured that all persons that are to work on the device can refer to the operating instructions at any time. In addition to the operating instructions, directives in the sense of the ordinance on industrial safety and health and the work equipment ordinance are also to be provided.
Keep the operating instructions for continued use. They must be passed-on to all successive owners, users and final customers.

1.3 Target group

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

1.4 Structure of operating instructions

The operating manual has a systematic structure. The order of the individual chapters corredsponds to the order of the work steps for first time installation of the device.
The operating instructions contain the following information:

- Device description
- Mechanical and electrical installation
- Accessories
- Operation and parameterising
- Start-up
- Parameter list
- Drive options and special functions
- Evacuation mode
- Diagnostic
- Software ZETAMON
- Enclosure

1.5 Exclusion of liability

Concurrence between the contents of these operating instructions and the described hardware and software in the device has been examined.
It is still possible that non-compliances exist; no guarantee is assumed for complete conformity. The contents of this manual are put through periodic reviews. Necessary modifications are incorporated into the next version.
Ziehl-Abegg AG is not liable for damage due to misuse, incorrect use, improper use or as a consequence of unauthorized repairs or modifications.

Symbols description

	**Asynchronous motors** The contents in the operating instructions refer specifically to the operation of asynchronous motors.
	**Synchronous motors**. The contents in the operating instructions refer specifically to the operation of synchronous motors.

1.6 Copyright

2 Safety instructions

2.1 General

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

2.2 Intended use

The ZETADYN 3BF is a frequency inverter for RPM control of three-phase current motors. The device is not designed for any other use than those listed here – this is considered as improper use.
Reading these operating instructions and complying with all contained instructions – especially the safety instructions contained therein – are considered part of intended use. Furthermore, carrying out all inspection work in the prescribed scheduled intervals is part of intended use
Not the manufacturer, rather the operator of the frequency inverter is liable for any personal harm or material damage arising from non-intended use!

2.3 Pictographs

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

	**Danger!** General hazardous area. Death or severe injury or significant property damage can occur if the corresponding precautions are not taken!
	**Warning!** Middle or high personal injury is possible if the corresponding precautions are not taken!
CAUTION!	**Caution!** Material damage is possible if the corresponding precautions are not taken!
	**Danger!** Danger by dangerous, electric voltage! Death or severe injury can occur if the corresponding precautions are not taken!
	**Information** Important information and advice for user

2.4 Product safety

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

2.5 Requirements placed on the personnel / due diligence

Persons entrusted with the planning, installation, commissioning and maintenance and servicing in connection with the device must have the corresponding qualifications and skills for these jobs. Based on their training, knowledge and experience as well as knowledge of the relevant standards, they must be able to judge the work transferred to them and be able to recognize possible hazards.
In addition, they must be knowledgeable about the safety regulations, EU directives, rules for the prevention of accidents and the corresponding national as well as regional and in-house regulations.
Personnel to be trained or instructed and apprentices are only permitted to work on the device under the supervision of an experienced person. This also applies to personnel undergoing general training.
Comply with the legal minimum age

2.6 Commissioning

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

During the commissioning following has to be observed:

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

2.7 Working on device / Hazards through residual voltage

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

Danger!
Through use of capacitors, danger of death exists even after switching off the device through directly touching the energized parts or due to parts that have become energized due to faults.
Wait at least **3 minutes** before working on the device.
The safe isolation from the supply must be checked using a **two-pole** voltage detector.

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

2.8 Modifications / interventions in the device

For reasons of safety, no unauthorized interventions or **modifications** may be made on the device . All planned modifications must be authorized by the manufacturer in writing.
Use only genuine spare parts / genuine wearing parts / genuine accessories from the Ziehl-Abegg AG.These parts were specifically designed for the device. There is no guarantee that parts from non-original sources are designed and manufactured in correspondence with load and safety requirements.
Parts and special equipment not supplied by the Ziehl-Abegg AG are not approved for use.

2.9 Operator's obligation of diligence

The device has been designed and constructed with consideration of a hazard analysis and after carefully selecting the harmonized standards to be complied with as well as additional technical specifications. It thus complies with the state-of-the art and ensures the highest degree of safety. However, this safety can only be implemented in operational practice if all measures necessary for this purpose are taken. The operator of the installation has the obligation of due diligence to plan these measures and monitor their implementation.

In particular, the operator must ensure that

- The device is only used as intended (cmp. chapter "Product overview" concerning this)
- The installation is operated solely in a flawless, functional condition and that especially the safety devices are periodically checked for their properly functioning condition
- The required personal safety gear is available to and used by the operating, maintenance and repair personnel
- The operating instructions are always readily available at the location where the frequency inverter is being used, are complete and are in legible condition
- Only sufficiently qualified and authorized personnel operate, maintain and repair the device
- these staff receive regular instruction in all relevant occupational safety and environmental protection issues, are knowledgeable about the operating instructions and, especially, are familiar with the safety instructions contained therein.
- All safety and warning notices attached to the device are never removed and remain legible

2.10 Employment of external personnel

Maintenance and service work are frequently carried out by external employees who often do not recognize the specific situations and the thus resulting dangers.
These persons must be comprehensively informed about the hazards in their area of activity.
You must monitor their working methods in order to intervene in good time if necessary.

3 Product overview

3.1 Application

The ZETADYN 3BF is a field-oriented Frequency inverter for speed control of three-phase motors developed for use in elevator machines.
The inverter is equipped with a microprocessing control. This drives the motor based on time and travel-dependent programs, which can be selected through the upstream elevator controls. The use of IGBT modules and a pulse width modulation in which the clock frequencies can be modified enable low-noise motor operation. The user interface specifically matched to elevator technology, interfaces and software enable simple installation and commissioning of the device.
The Frequency inverter is designed for elevator installations for passenger and freight transport with a high demand on travel comfort and positioning accuracy.
Frequency inverter for operating asynchronous motors and synchronous motors are available.

3.2 Functional description

The Frequency inverter places a three-phase line with variable frequency and variable voltage at your disposal. The amount of voltage and rate of frequency depends on the selected traveling speed and the load to be carried. By using a field-orientated control, the motor is optimally operated at all operating points. As a result, every torque required is made available practically without delay. Even in standstill (speed 0), the motor's entire torque rating is available.

3.2.1 Ziehl-Abegg drive control features

- The drive cycle is controlled from the start (speed 0) up to standstill (speed 0)
- Highly dynamic and high positioning accuracy
- Large speed control range
- Simple commissioning and operation
- Extensive diagnostics functions
- High level of safety through multiple monitoring functions
- Robust EMC behavior

The functional features mean problem-free adaptation to the most varied kinds of applications is feasible.

3.2.2 Control system

The Frequency inverter and the elevator control communicate with each other through inputs and outputs.
The time and travel-dependent programs are activated by triggering the inputs.
The control system receives constant feedback about the drive's service condition through the potential-free relay outputs.
Instead of conventional wiring, it is possible to implement a connection between the frequency inverter and the elevator control by using a serial control (see chapter "DCP mode") or a CAN-Bus-control (see chapter "CAN-mode"). As a result, wiring the inputs and outputs is omitted, reducing the wiring costs.

3.2.3 Parameterisation

The traveling speeds, accelerations and therefore additional installation-specific parameters can be entered with the aid of the integrated display and operator unit using text dialogues.
Configuration can also be done using a Notebook and the ZETAMON software (see the "ZETAMON software" chapter).

3.2.4 Controller

All operating curves are run speed controlled and load independent. The flux control enables very precise compliance with the specified operating curves throughout the entire speed-control range.
The closed loop control can be used up to a speed of 3.2 m/s (higher speeds available on request).
The brakes operate almost wear-free throughout the controlled operation from speed 0 (start) to speed 0 (stop).

3.3 Requirements / notices

3.3.1 Complete system

Ziehl-Abegg AG can provide you with optimally matched drive systems. Such a system is composed of the following components:

- Asynchronous or synchronous motor including traction sheave
- Frequency inverter type ZETADYN 3BF
- Brake resistor or Brake-Chopper
- Encoder (mounted on motor)

When you purchase a complete system, no special conditions need to be met for the individual components and no special instructions need to be followed.

3.3.2 Single components

When purchasing an individual frequency inverter (e.g. when during conversions or in connection with motors from other manufacturers), the following instructions must be complied with.

3.3.2.1 Motors

During conversions, check to see if the motor works correctly in all operating- modes in its previous operation. The motor (and possibly the gearbox) must run quietly, without imbalance and without play. Existing mechanical weakness cannot be improved by the closed loop control; rather, they may make controlled operation impossible under certain circumstance.

Information

Before converting an installation, it is recommended to measure the following data in the old motor (in direction of travel, empty car, downwards) and to note the:

- Speed
- Current consumption

These data are needed for later parameterisation of the frequency inverter.

3.3.2.2 centrifugal masses

To reduce the acceleration currents, all additional centrifugal masses should be removed if possible. Solid hand wheels should be replaced by hand wheels made of plastic or aluminum.
However, please note that by removing the centrifugal masses, it is possible that an imbalance arises

3.3.2.3 Frequency inverter

When selecting the frequency inverter, it is assumed that the motor to be controlled will be loaded with the rated torque at the rated speed. Additional torque is required to accelerate the motor. To create this torque, an additional current of approx. 60 – 80% of the rated current is necessary. That means during acceleration, the motor's current consumption is approx. 160 – 180% of the rated current.
The frequency converter can be loaded to up to 180% of the rated current for a maximum of 3 seconds. For this reason the current which is set when the motor accelerates may not be greater than 180% of the rated current.
In general, valid is:

$$I_{Nenn\ Frequenzumrichter} \geq I_{Nenn\ Motor}$$

3.3.2.4 Brake-Chopper / Brake-Resistor

When selecting the Brake-Chopper / Brake resistor, please note that gearless installations regenerate much more energy than installations with gearboxes. That makes it feasible that twice the energy is regenerated with the same size frequency inverter. When retrofitting an installation, you must recalculate the desigm of the Brake-Chopper / Brake resistor

3.3.2.5 Encoder

The pin assignment of the SUB-D sockets X-ENC9 and X-ENC15 for connecting the rotary encoder is not standardised. When using pulse encoders of other manufacturers, make sure that these have the same contact assignment and an interface with identical specification.
Please refer to the "Electrical installation / encoder connection " chapter for the pin assignments and interface specifications.

3.4 Service & maintenance

These jobs must be completed during the recurrent maintenance work:

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

3.5 Transport

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

3.5.1 Storage duration:

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

Storage duration:

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

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

New formation:

To reform, the frequency inverter needs to be connected to reduced voltage for ca. 1 hour (230V AC at L1 / L2).

3.6 Disposal & recycling

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

4 Mechanical installation

4.1 General notes

Danger!

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

Before installation

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

During installation

- Mount the device in a torsion free conditions
- Mount the device in a torsion free conditions
- avoid that drilling chips, screws and other foreign bodies reach the interior of the device
- Maintain the stated minimum clearances to ensure unobstructed cooling- air feed as well as unobstructed outgoing air discharge (see fig.)
- To ensure EMC-acceptable installation, mount the device on a galvanized or chrome-plated and grounded mounting plate. When using a painted mounting plate, the paint must be removed from the contact-surface areas.

Ambient conditions

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

4.1.1 Wall installation

The device is designed for installation in a switch cabinet. Wall installation outside the switch cabinet is not permitted.

4.1.2 Switch cabinet installation

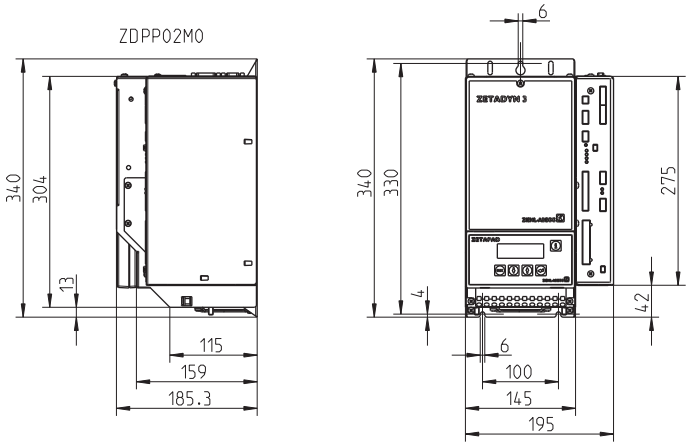
CAUTION!

Caution!

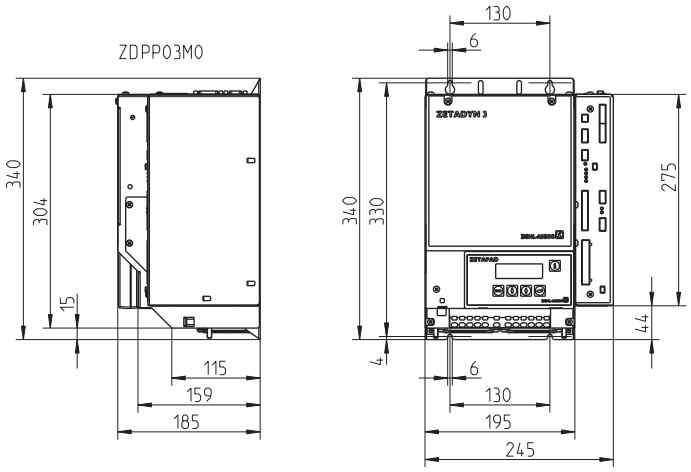
With an installation in the control cabinet, a sufficient cooling must be assured. At this the power loss of the device (see chpater "Technical data") has to be observed.

To ensure unobstructed airflow, the device must be installed in a vertical position!

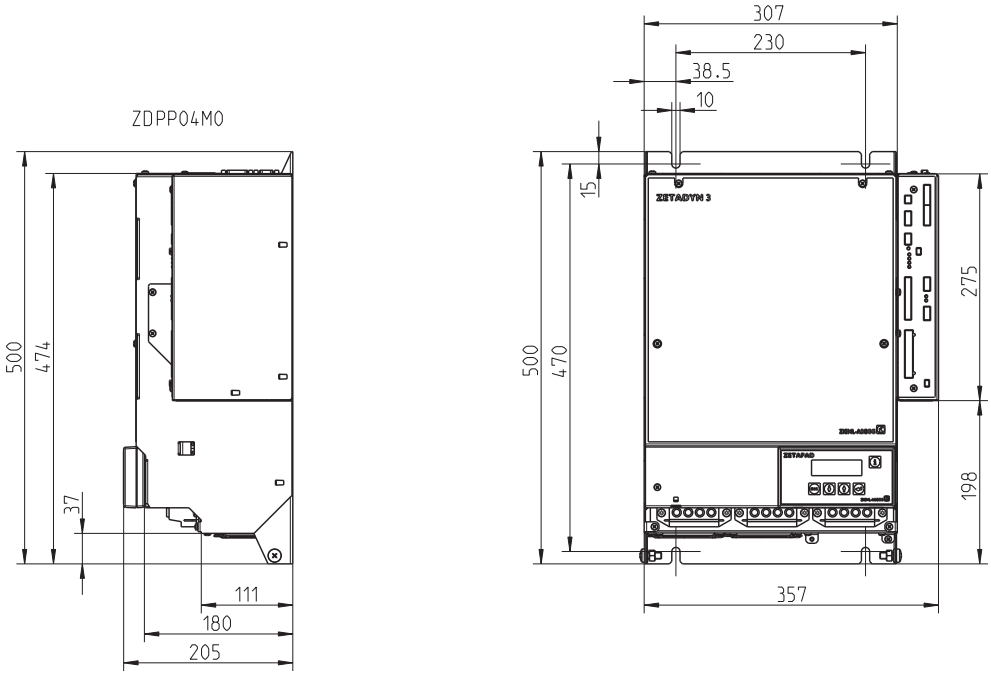
4.2 Dimensions



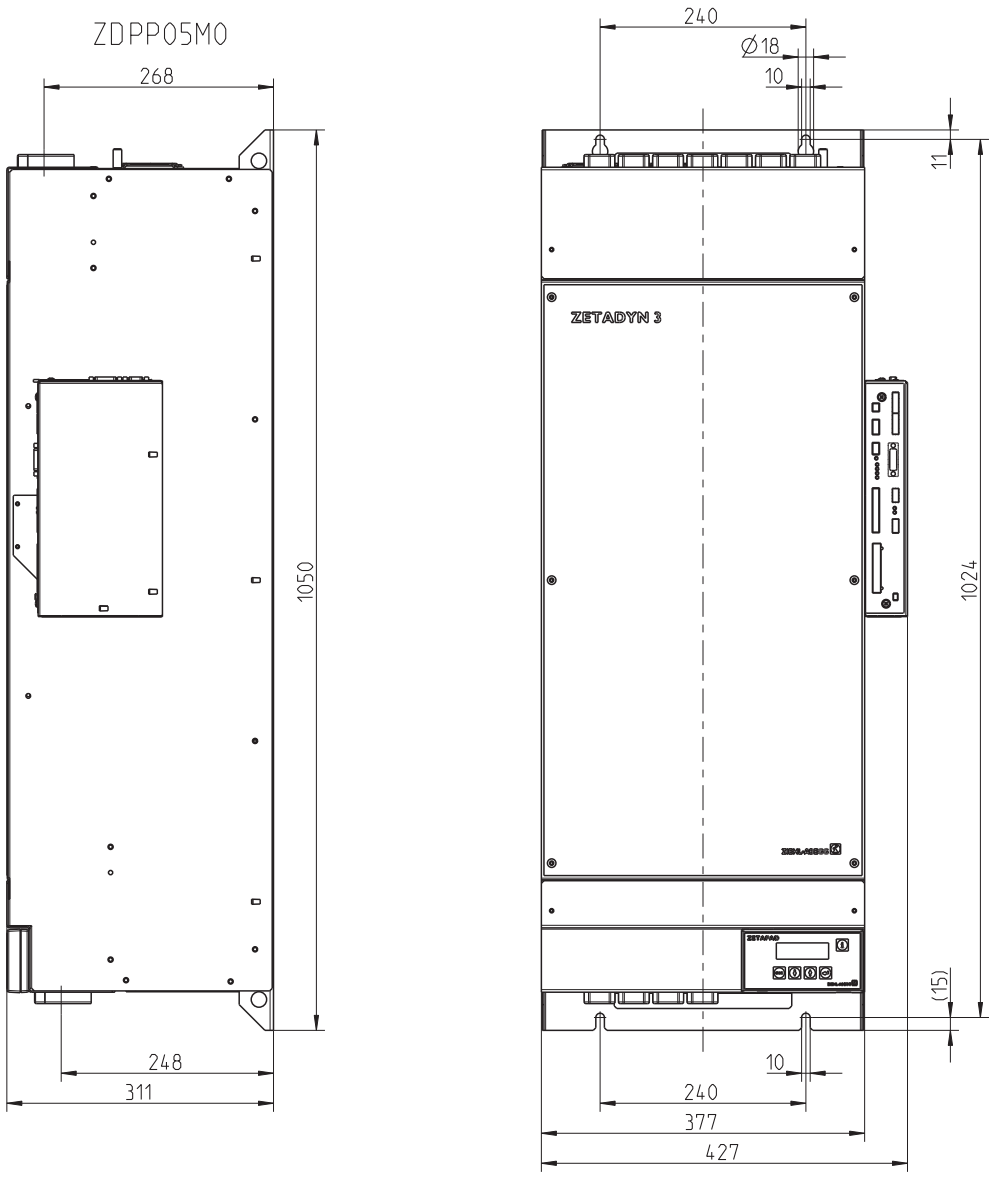
Dimensions ZETADYN 3BF011 up to ZETADYN 3BF017



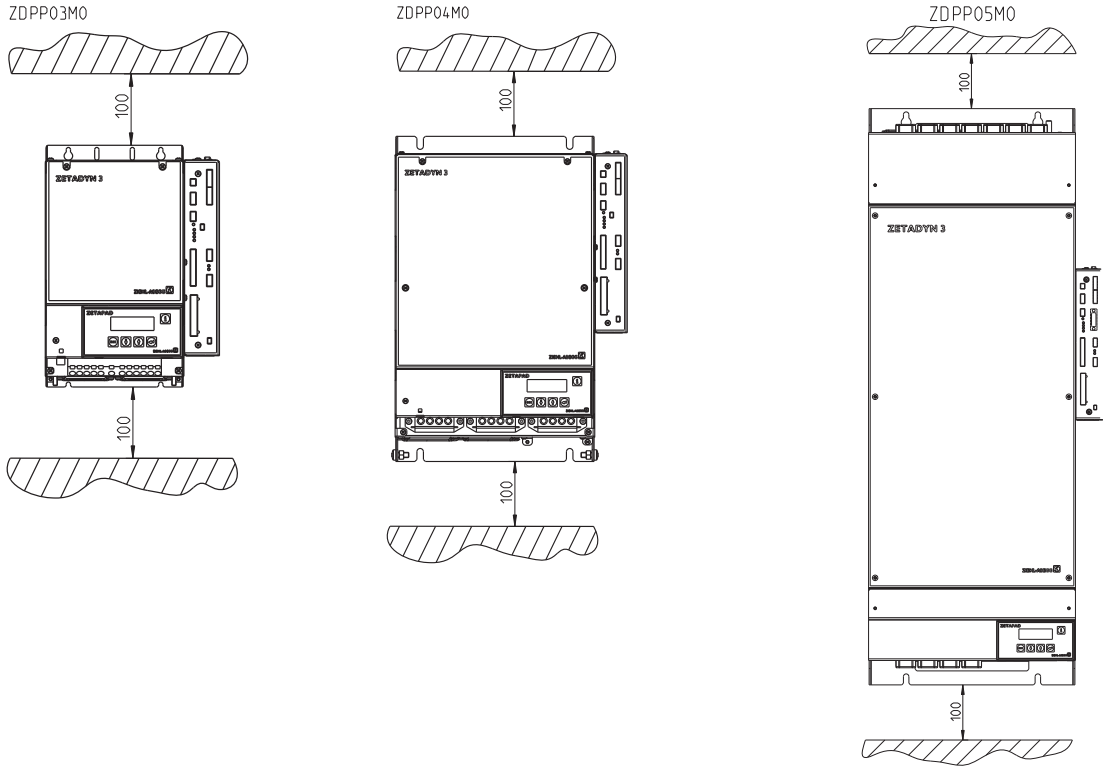
Dimensions ZETADYN 3BF023 up to ZETADYN 3BF040



Dimensions ZETADYN 3BF050 up to ZETADYN 3BF074



Dimensions ZETADYN 3BF110 up to ZETADYN 3BF180



Minimum distances ZETADYN 3BF011 up to ZETADYN 3BF180

5 Electrical installation

Danger!
It is forbidden to carry out work on electrically live parts.
Even after disconnection, the DC-link (terminals X1: +DC / X1: -DC) are still live.
Wait at least 3 minutes before working on the device

Danger!
Operating the ZETADYN 3BF with the housing cover removed is prohibited because energized, exposed parts are present inside the device. Disregarding this regulation can lead to severe personal injury.

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

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

Inspect electrical equipment periodically: retighten loose connections – immediately replace damaged lines and cables.
Always keep switch cabinets and all electrical supply facilities locked. Access is only allowed for authorized persons using a key or special tool.

Never clean electrical equipment with water or similar liquids.

5.1 EMC-compatible installation

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

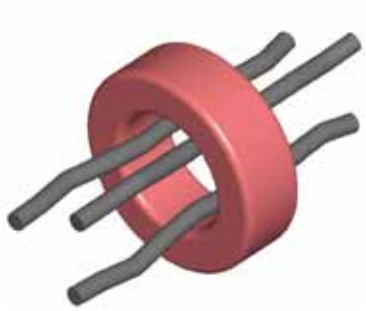
- EN 12015 Electromagnetic compatibility – product series standard for lifts, escalators, moving pavements – spurious emission
- EN 12016 Electromagnetic compatibility – product series standard for lifts, escalators, moving pavements – interference immunity

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

- Integrate power choke and radio interference filter into the mains line
- Use only shielded cables for motor and brake chopper or brake resister connections.
- Max. motor line length is 25m
- Wind unshielded cables of brake resistors type BR09-1 and BR11-A around the toroidal core provided (see figure)
- Feed the motor cables at output U/V/W of the frequency converter through the toroidal core provided (see figure)
- If you must interrupt the shielding on a cable (e.g., to install a motor contactor), the shielding must be subsequently continued with the lowest possible HF impedance.
- Use only shielded control cables
- The shielding of power cables (motor cable, Brake-Chopper cable) must be connected to ground on both sides
- The shielding of control cables (in- and outputs, encoder cable, ...) must be connected to ground only at the inverter
- Use shielded lines in the switching cabinet also
- Do not twist shielding for connections; use a suitable shield connection system (e.g. Shield-Kon®)
- Run the control cables and the encoder cables separate from the power cables
- Flawless electrical contact must exist between the grounded mounting plate and the metal housing of the frequency inverter
- Provide connected inductances (brakes, motor contactors) with suppressors

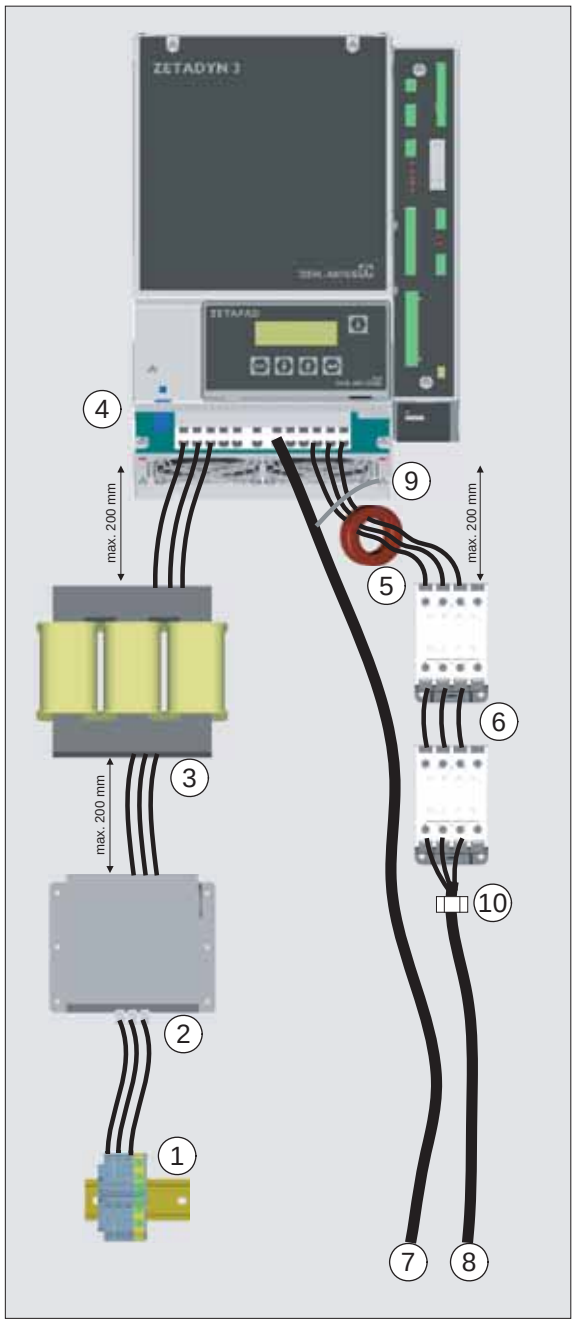
Information
Please contact the manufacturer for information on adhering to the limit value class B in accordance with EN 55011.

Toroidal core in BR09-1 and BR11-A



Toroidal core for motor cable

5.1.1 EMC-compatible assembly of the control cabinet



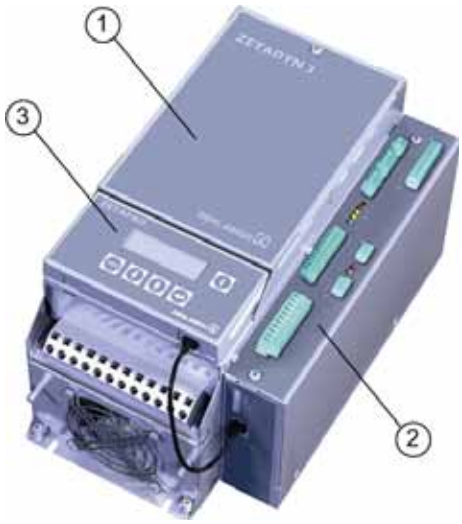
1 Mains connection
2 Radio interference filter FEF
3 Line reactor
4 ZETADYN 3BF
5 Toroidal core for motor cable
6 Motor Contactors
7 Brake resistor cable (shielded)
8 Motor cable (shielded)
9 Shielding (brake resistor cable)
10 Cable clamp (shielded)

The following points must be observed if the in chapter 5.1 mentioned standards are to be adhered to:

- see chapter 5.1
- Leadlength between radio interference filter and line reactor max. 200mm
- Leadlength between line reactor and ZETADYN 3BF max. 200mm
- Leadlength between ZETADYN 3BF and 1. motor contactor max. 200mm
- Assemble the mains line (incl. mains connection, radio interference filter and line reactor) seperate from the brake resistor cable and the motor contactors (incl. motor cable)

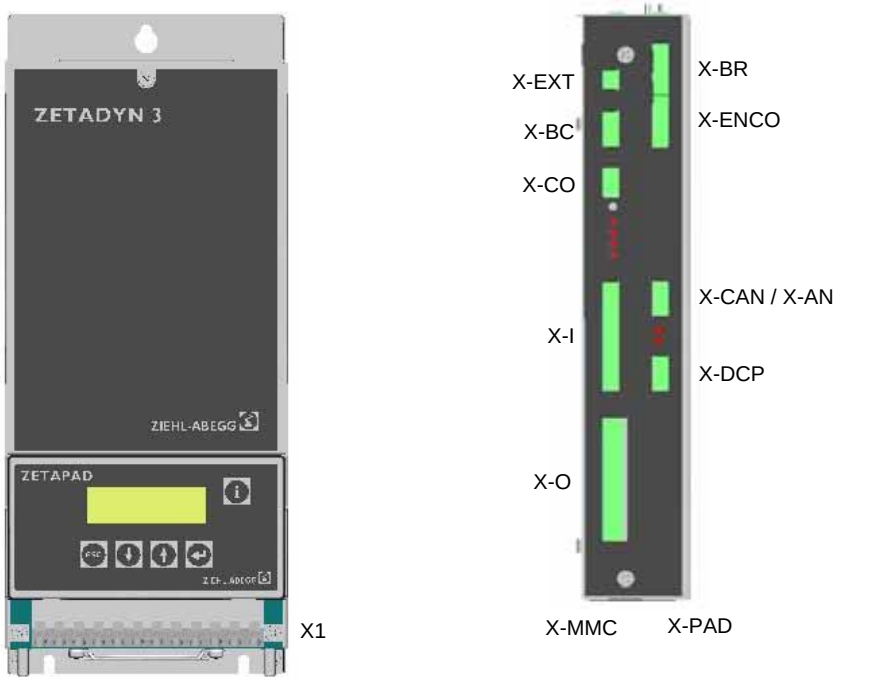
5.2 Configuration / Terminal positions

5.2.1 ZETADYN 3C011 to 3C074



Configuration ZETADYN 3BF011 to 3BF074

1 Power unit
2 Controller unit (with open loop control inputs and control outputs)
3 Operating terminal ZETAPAD



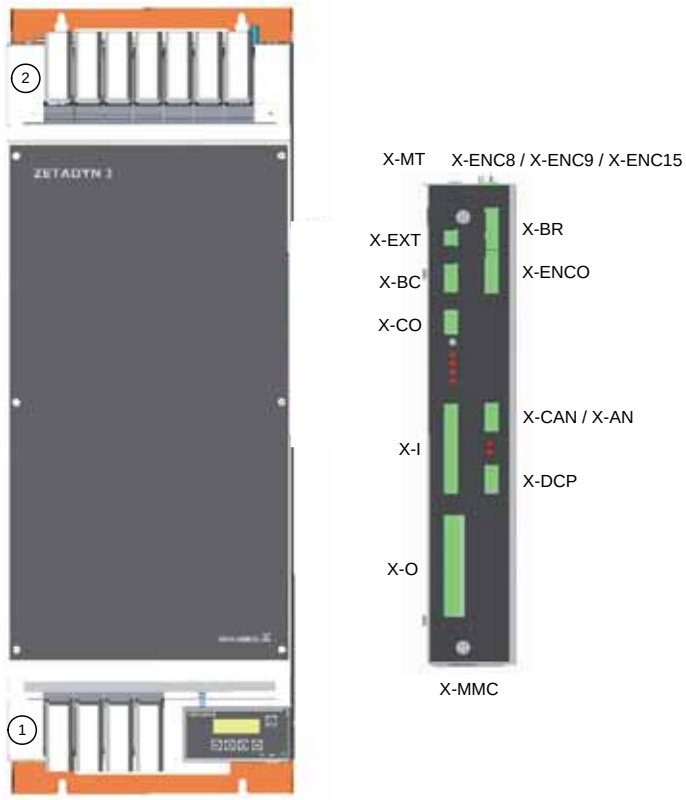
Terminal positions

X1 Mains / Motor / Brake-Chopper / Brake-Resistor
X-EXT external 24V DC power supply
X-BC Allocation of Brake-Chopper / Brake-Resistor
X-CO Contactor monitoring
X-I Digital inputs
X-O Digital outputs
X-MMC Memory card
X-PAD ZETAPAD
X-DCP DCP
X-CAN CAN
X-ENCO Artificial encoder
X-BR Motor brake monitoring
X-ENC8 Encoder
X-ENC9 Encoder SUB-D
X-ENC15 Absolute encoder SUB-D

5.2.2 ZETADYN 3BF110 to 3BF180

Configuration ZETADYN 3BF110 to 3BF180

1 Power unit
2 Controller unit (with open loop control inputs and control outputs)
3 Operating terminal ZETAPAD

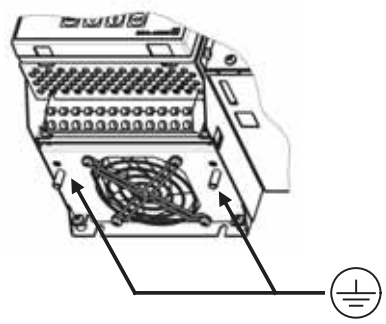


Terminal positions

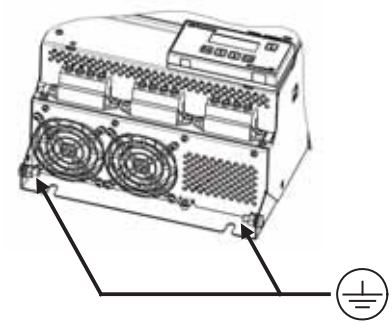
1 Mains connection
2 Motor / brake chopper / brake resistor
X-EXT external 24V DC power supply
X-BC Allocation of Brake-Chopper / Brake-Resistor
X-CO Contactor monitoring
X-I Digital inputs
X-O Digital outputs
X-MMC Memory card
X-PAD ZETAPAD
X-DCP DCP
X-CAN CAN
X-ENCO Artificial encoder
X-BR Motor brake monitoring
X-ENC8 Encoder
X-ENC9 Encoder SUB-D
X-ENC15 Absolute encoder SUB-D

5.3 Protective ground connection

Due to leakage currents > 3.5 mA, a second PE conductor must be used in accordance with EN 50178:1997. The cross-section must correspond at least to the cross-section of the connecting cable's PE conductor. An M6 threaded bolt is available on the device to connect the second PE conductor(see Fig.).
The cable for the second PE conductor must have a temperature resistance of ≥ 90 °C.



Protective ground connection ZETADYN 3BF011 up to ZETADYN 3BF040



Protective ground connection ZETADYN 3BF0050 up to ZETADYN 3BF074

5.4 Mains connection (X1)

Danger!
Before connecting to mains you have to check if the technical Datas on the rating plate of the device are according to the required connecting values.

5.4.1 Network form

The mains filter and frequency converter are designed for use in an earthed supply system. Permissible network forms are:

- TN network
- TT network

Information
The mains filter and frequency converter are unsuitable for use in the IT network!

5.4.2 Line cross-section

The line cross-section must be specified dependent on the motor's rated current and the ambient conditions (e.g. temperature, wiring method) in accordance with DIN VDE 0100.

5.4.3 Mains fuse

The fuse protection is implemented in accordance with the line cross-section used

5.4.4 Type of cable

Both rigid and flexible lines can be utilized. The use of wire-end sleeves is recommended for flexible lines.
The mains line does not have to be shielded.

5.4.5 Connection

Type ZETADYN 3BF011 bis ZETADYN 3BF040

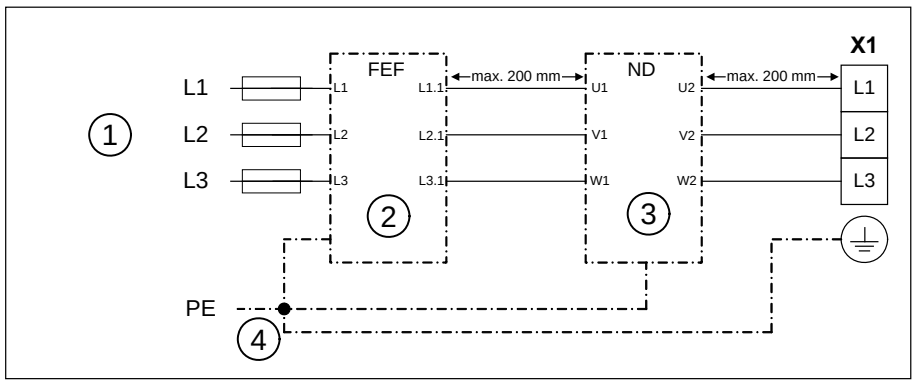
The mains connection is designed with spring contact terminals. To avoid damage to the connection terminals and to ensure a safe contact, a suitable screwdriver must be inserted into the terminals as far as it will go to fully open them when connecting cables.

Type ZETADYN 3BF050 up to ZETADYN 3BF074

The mains connection is implemented with screw terminals. To prevent damage to the terminals and to ensure good contact, the terminals must be tightened with the torque as stated in the technical data.

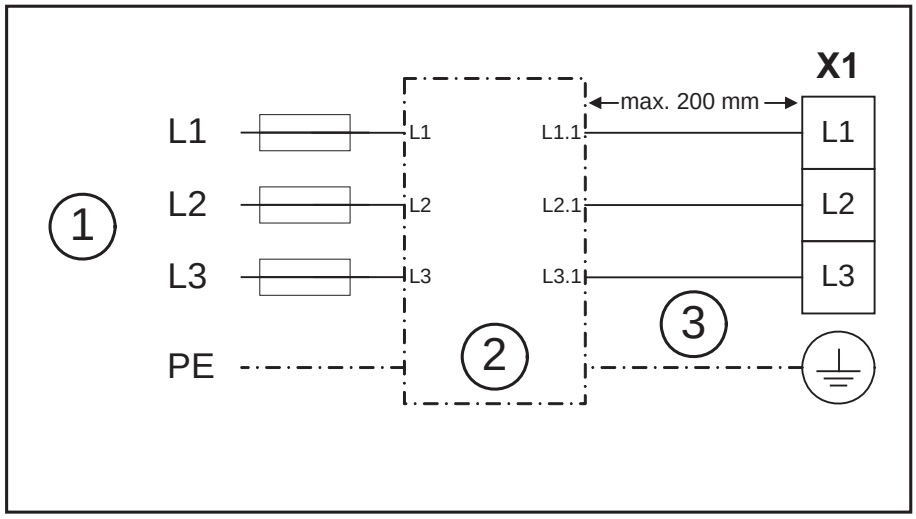
Type ZETADYN 3BF110 bis ZETADYN 3BF180

The mains connection is implemented with screws M12 for ring terminals. To prevent damage to the cables and the connecting screws and to ensure good contact, the terminals must be tightened with the torque as stated in the technical data.



Mains connection ZETADYN 3BF011 und ZETADYN 3BF050-074

1 Mains 3~ 400V/PE/50Hz
2 Radio interference filter FEF
3 Line reactor ND
4 Central ground point



Mains connection ZETADYN 3BF013 - 040

1 Mains 3~ 400V/PE/50Hz
2 Line reactor-radio interference filter
3 Prefabricated connection wires

5.5 Line reactor-radio interference filter

Installation in the mains feed to comply with:

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

CAUTION!

When the frequency inverter is operated without a power choke, the harmonic limit values quoted in product family standard EN12015 are not met. The service life of the device is also considerably shorter.

The line reactor and the radio interference filter are two separate components which have to be mounted in the switch cabinet.
With the line reactor radio-interference filter from Ziehl-Abegg, compliance with these standards and directives is guaranteed.
Please refer to the "Accessories“ chapter for a detailed description.

5.6 Residual current operated device (RCD)

Danger!

According to DIN EN 50178 it is not permissible to use pulsed current sensitive RCD's (type A) because a direct current component in the error current could prevent the RCD from triggering.
A universal current-sensitive, selective RCD (type B) according to DIN-VDE 0644-100 must be used
To ensure as high a degree of reliability as possible we recommend a release current of 300 mA, where a fault current circuit breaker is used.

Information

Please note that even when using a correct type B RCD, false triggering due to high protective earth currents (stray current) can still occur and that operation with these protective devices is not possible.

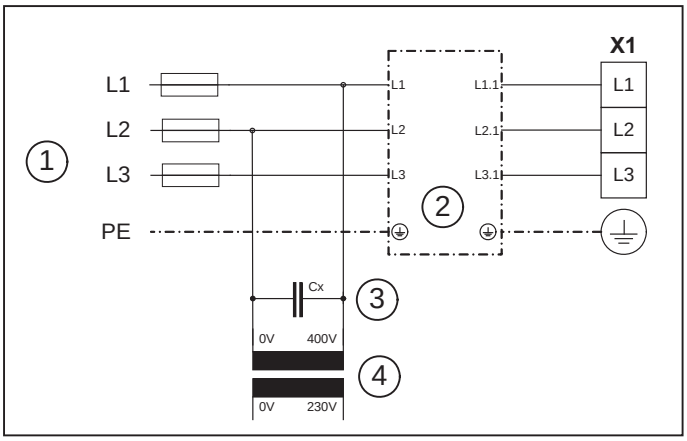
5.7 Control transformer in the mains feed line

CAUTION!

Caution!

When using a control transformer in the frequency inverter’s mains supply line, you must connect a capacitor parallel to the transformer’s primary winding (see Fig.).

The capacitor is used to prevent an extreme increase in voltage in case the voltage fails in one of the phases to which the transformer is connected. This voltage increase can lead to destruction of the line filter. The cause of voltage increases is resonance of the control transformer with the radio-interference suppression components, which are always used in frequency inverters.



Control transformer in the mains feed line

1 Mains 3~ 400V/PE/50Hz
2 Line reactor-radio interference filter
3 Capacitor
4 Control transformer

Recommended capacitor types for Cx:

- Epcos Typ B25832 10µF/640V-AV
- Condensers for motor starting with following data: 10µF/450V-AC

In addition, you must comply with the following:

- During sequential disconnection, switch off the phase on which the transformer is operated last
- Do not oversize the transformer
- If a loaded and an intermittently unloaded transformer is operated in the open loop control, operate these on the same phases

5.8 Motor connection (X1)

5.8.1 Line cross-section

The line cross-section must be specified dependent on the motor´s current and the ambient conditions (e.g. temperature, wiring method) in accordance with DIN VDE0298-4.

5.8.2 Type of cable

Always use shielded cables for the motor connections! Both rigid and flexible lines can be installed. The use of wire-end sleeves is recommended for flexible lines.

5.8.3 Cable lengths

The maximum line length is 25 m. With a motor power line **>25 m** compliance with DIN EN 12015 (electromagnetic compatibility – spurious emission and DIN EN 12016 (electromagnetic compatibility – interference immunity) can no longer be guaranteed.

5.8.4 Connection

Type ZETADYN 3BF011 bis ZETADYN 3BF040

The mains connection is designed with spring contact terminals. To avoid damage to the connection terminals and to ensure a safe contact, a suitable screwdriver must be inserted into the terminals as far as it will go to fully open them when connecting cables.

Type ZETADYN 3BF050 up to ZETADYN 3BF074

The mains connection is implemented with screw terminals. To prevent damage to the terminals and to ensure good contact, the terminals must be tightened with the torque as stated in the technical data.

Type ZETADYN 3BF110 bis ZETADYN 3BF180

The mains connection is implemented with screws M12 for ring terminals. To prevent damage to the cables and the connecting screws and to ensure good contact, the terminals must be tightened with the torque as stated in the technical data.

5.8.5 Motor contactors

Select the motor contactors depending on the type of motor and the corresponding motor data. According to DIN EN 81-1, the motor contactor contacts must be self-commutated.

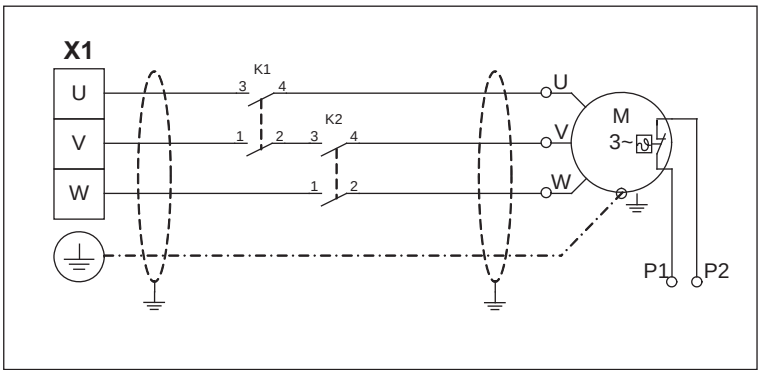
When operating asynchronous motors, two master contactors per at least 2 main contacts (make contact element, NO contact) are required for the motor connection and 2 auxiliary contacts (NO contacts) for contact monitoring (see wiring diagram).

For operating synchronous motors 1 main contactor with 4 main contacts (2x normally open and 2x normally closed) and 2 main contactors with at least 2 main contacts (normally open) are required for the motor connection. Both main contactors require 2 auxiliary contacts each (normally open) for contactor monitoring (see connection diagram).

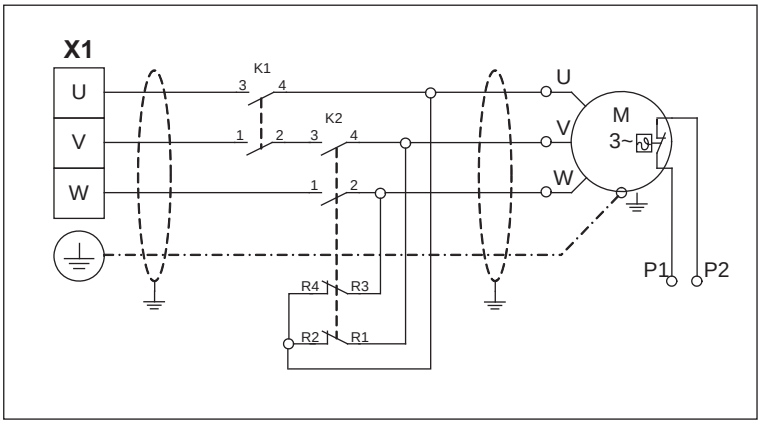
The maximum line length to the motor contactors when using non-shielded lines is **200mm**. If there is a greater distance between the contactors and frequency inverter, you must use shielded lines!

Danger!

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



Asynchronous motor connection



Synchronous motor connection

Information

S

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

CAUTION!

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

5.8.6 Contacting the shielding in the switch cabinet

You must connect the shielding on the switch cabinet side in to the PE near the contactors

5.8.7 Contacting the shielding on the motor

Connect the shielding on the motor side to the PE junction that is located directly on the motor housing.
For prefabricated motor lines from Ziehl-Abegg, the shielding connection is provided with a ring cable eye for the corresponding thread size.
When using non-prefabricated lines, implement the shielding connection by using a suitable shielding connection system (e.g. Shield-Kon®).

5.9 Motor temperature monitoring (X-MT)

Information
The frequency inverter must be equipped with the option module EM3-MOT-TEMP (item no. 357108) for motor temperature monitoring!

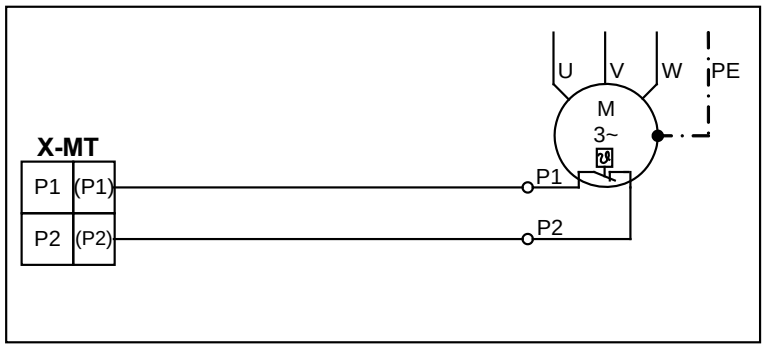
Information
The detection of over temperature of the motor doesn't cause a drive interruption. The current drive will be completed.
If an over temperature of the motor will be detected at stop, there is no further drive possible.

The temperature monitoring is carried out according to IEC 64800-5-1:2002-02 (switching point at 3500Ω)
The following sensor types can be used:

- PTC thermistor (PTC according to DIN 44082)
- Temperature sensor KTY84-130
- Thermal circuit breaker

The used sensor has to be parametrized in the menue **Monitoring/P1P2**!

```
Monitoring
↳ P1P2     On
  ↳        On
Motor-temp. monitoring
```



Temperature monitoring connection

() terminal designation of connector

Information
If the temperature monitor is not used, it must be switched off (**Monitors/P1P2=Off**). Short-circuiting of the inputs P1 and P2 is detected as a fault by the ZETADYN 3.

5.10 Digital inputs (X-IN)

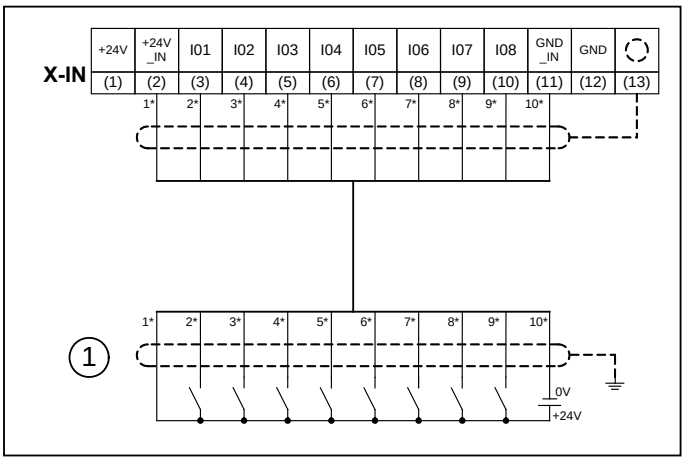
Standard, there are digital inputs available on the X-IN 8 terminals for parallel activation of the frequency inverter. The inputs are pre-parameterized but can be assigned with other functions by modifying the parameters

The inputs can be activated galvanically isolated by an external 24 V power supply in the control system or by the internal 24 V supply in the frequency inverter.

Information

Use shielded cables for the connections. The shielding must be connected to the terminal X-IN shielding connection.

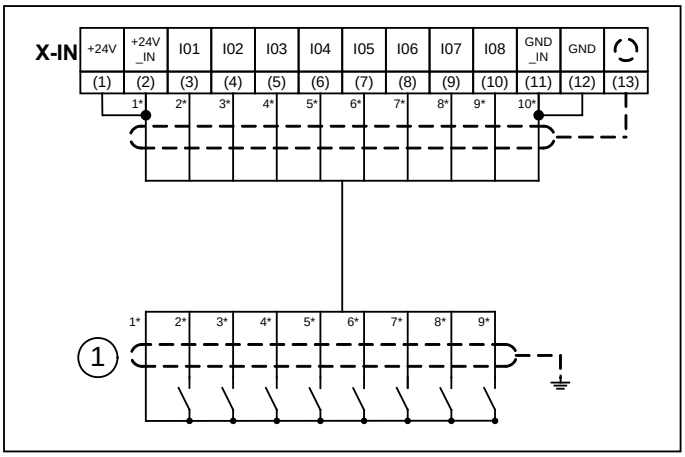
5.10.1 Connection with external power supply



Connection of digital input with external power supply

1 Control system
() terminal designation of connector

5.10.2 Connection with internal power supply



Connection of digital input with internal power supply

1 Control system
() terminal designation of connector

Information

When using the internal power supply, you must make a bridge between both 24V terminals and both 0V terminals.

CAUTION!

Caution!

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

5.10.3 Technical data

The digital inputs comply with the IEC61131-2 TYPE 2 industry standard.

Voltage range	+22 ... 26 VDC
Switching level low/high	<5 VDC / >11 VDC
Current consumption at 24 V	typ. 12.6 mA
Clamping range	max. 1,5 mm²

5.10.4 Terminal assignment X-IN

You can configure the inputs I1 … I8 assignments. The configuration can be implemented by:

- Presetting the used control system (assignment corresponding to the control requirements)
- Free configuration

Implement configuration of the digital inputs in the **Control system\CONFIG** menu.

The input assignments dependent on the configuration:

Configuration	Inputs							
	I01	I02	I03	I04	I05	I06	I07	I08
00:Free	RF*	V1*	V2*	V3*	VZ*	RV1 UP*	RV2 DOWN*	Free*
01:ZA_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	Free*
03:BP_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	Free*
08:KN_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	Free*
11:NL_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	Free*
13:SS_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	V4*
15:ZA_BIN	RF	DIR	BIN0	BIN1	BIN2	Free*	Free*	Free*
16:WL_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	Free*
21:ST_IO	RF	V1	V2	V3	VZ	RV1 UP	RV2 DOWN	Free*
24:CSILVA	RF	BIN0	BIN1	BIN2	Free	RV2 DOWN	RV1 UP	Free*
25:S+S	SBIN2	SBIN1	SBIN0	RV1 UP	RV2 DOWN	Free*	Free*	RF
27:MAS_BIN	RF	DIR	MBIN0	MBIN1	MBIN2	BR1	BR2	Free*
30:KS_IO	RF	V1	V4	V2	VZ	RV1 UP	RV1 UP	V3*

* *The function of the inputs can be changed*

Information

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

- Controller enable
- Speed
- Direction default

5.10.5 Binary traveling speed defaults Standard (CONFIG=15:ZA_BIN)

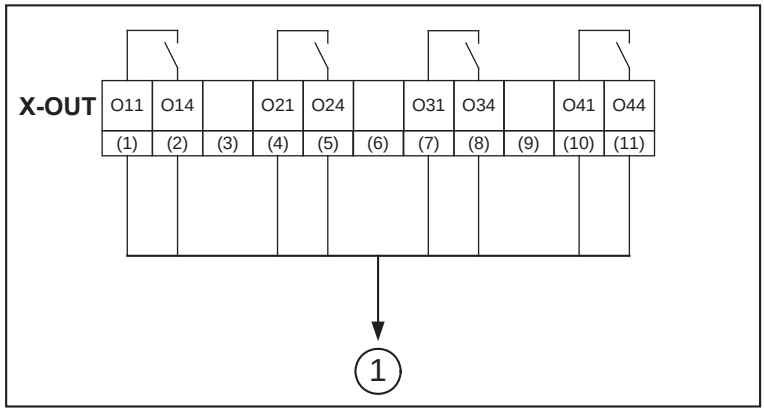
Travel speed V_3	Binary inputs		
	BIN2	BIN1	BIN0
-	0	0	0
V1	0	0	1
V2	0	1	0
V3	0	1	1
V4	1	0	0
V5	1	0	1
V6	1	1	0
V7	1	1	1

5.11 Digital outputs (X-OUT)

5.11.1 Digital outputs X-OUT

The connection terminal X-OUT is equipped with 4 digital outputs as zero potential relay contacts with normally open function. The functions of the outputs are pre-parameterised but can be assigned other functions by changing the parameters.

5.11.1.1 Connection X-OUT



Connection of the digital outputs X-OUT

1 Control system
() terminal designation of connector

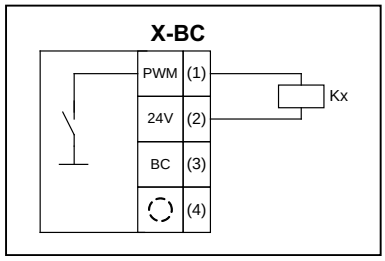
5.11.2 Digital output X-BC:PWM

The connection terminal X-BC is equipped with 1 digital output, connection PWM, with normally open function. The functions of the output is pre-parameterised but can be assigned another function by changing the parameter.

Information

WARNING! The PWM output does not have zero potential. The GND potential of the internal 24 V mains supply is connected!

5.11.2.1 Connection PWM



Connection of the digital output PWM

Kx Control relay
() terminal designation of connector

5.11.3 Technical data

	X-OUT	X-BC (PWM)
Short-circuit-proof	no*	
Min. switching capacity	5 mA / 12 VDC	5 mA / 24 VDC
Max. switching capacity	2 A / 250 VAC	50 mA / 24 VDC
Line cross-section	max. 2,5 mm²	max. 1,5 mm²

CAUTION!

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

5.11.4 Terminal assignment X-OUT

The output assignments can be configured. The configuration can be implemented by:

- Presetting the used control system (assignment corresponding to the control requirements)
- Free configuration

Implement configuration of the digital outputs in the **Control system\CONFIG** menu.
Please refer to the "Parameter list / Control menu" chapter for a description of the individual parameters

The output assignments dependent on the configuration:

Configuration	Outputs				
	O11 - O14	**O21 - O24**	**O31 -O34**	**O41 - O44**	**PWM**
00:Free	Fault*	MB_Brake*	MotContact*	V < V_G1*	AUS*
01:ZA_IO	Fault	MB_Brake	MotContact	V < V_G1	AUS
03:BP_IO	Fault	MB_Brake	MotContact	V < V_G1	AUS*
08:KN_IO	Fault	MB_Brake	MotContact	V < V_G1	AUS*
11:NL_IO	Fault	MB_Brake	MotContact	V < V_G1	AUS*
13:SS_IO	Fault	MB_Brake	MotContact	V < V_G1	AUS*
15:ZA_BIN	Fault	MB_Brake	MotContact	V < V_G1	AUS*
16:WL_IO	Fault	MB_Brake	MotContact	V < V_G1	AUS*
21:ST_IO	Fault	MB_Brake	MotContact	V < V_G1	AUS*
24:CSILVA	Fault	MB_Brake	MotContact	V < V_G1	AUS*
25:S+S	MotContact	MB_Brake	V=O	Fault	AUS*
27:MAS_BIN	Fault	MB_Brake	MotContact	Off*	AUS*
30:KS_IO	Fault	MB_Brake	MotContact	V < V_G1	AUS*

* *The function of the outputs can be changed*

5.12 DCP interface (X-DCP)

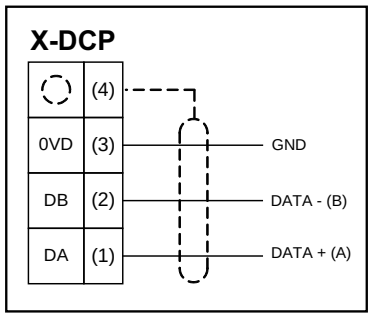
Alternative to conventional wiring, it is also possible to activate the frequency inverter through a DCP protocol via the RS485 interface X-DCP (see "DCP operation“ chapter).

Information
Operating the frequency inverter with DCP protocol is only feasible with the option module EM3-CAN-DCP (item no. 357107)!

Information

- Use a shielded cable for the connection. The shielding must be grounded to ground on both ends
- Make the connection between the frequency inverter and the control system without additional terminal points.
- The maximum line length is 50 m.

5.12.1 Electrical connection



DCP connection

() terminal designation of connector

5.13 Encoder connection asynchronous motors (X-ENC8 X-ENC9)

X-ENC9:9-pole SUB-D jack for connection with Sub-D plug
X-ENC8:8-pole terminal strip for discrete connection

Information
When operating the motor with a sinusoidal or incremental encoder, the frequency inverter must be equipped with the option module EM3-ENC-ASM-ZA (item no. 357104)

- Use a shielded cable for the connection.
- Attach the shielding on the inverter corresponding to the terminal or pin assignments.
- Make the connection between the frequency inverter and the encoder without additional terminal points.

CAUTION!

Caution!
The SUB-D jack X-ENC9 pin assignments are not standardized. When using external encoders, make sure that they have the identical contact assignments and an interface with identical specifications.

CAUTION!

Caution!
Before the impulse encoder can be plugged in or connected, the encoder type and the encoder resolution need to be parameterized in the **"Encoder & BC/ENC_TYP"** and **"Encoder & BC/ /ENC_INC"** menu.

```
Encoder & BC
↳ENC_Typ EnDat/SSI
  ↳      EnDat/SSI
Encoder Typ
```

```
Encoder & BC
↳ENC_Inc 2048
  ↳      2048
Encoder resolution
```

5.13.1 Technical data X-ENC8 X-ENC9

Encoder types	Sinusoidal encoder (X-ENC8 and X-ENC9) Inkremental encoder TTL (X-ENC8 und X-ENC9) Incremental encoder HTL / TTL (only X-ENC8)
Encoder resolution	64 ... 4096 pulse / revolution
Input resistor	120 Ω
Cut-off frequency	200 kHz
TTL differential frequency (against GND)	Ulow <= 0,5 V Uhigh >= 2,5 V
Sine differential signal (at 2.5 V offset against GND)	0,6 Vss ... 1,2 Vss (typ. 1Vss)
Connection cable	Shielded twisted pair cable
Terminal assignment X-ENC8	max. 1,5mm²
Max. cable length	25 m

5.13.2 Terminal assignment X-ENC8

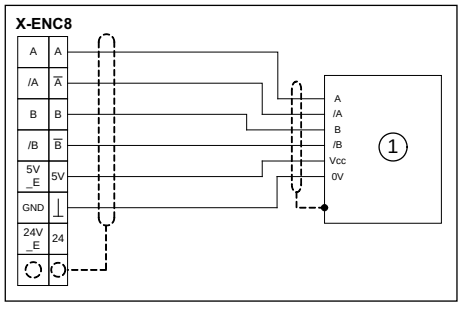
A	Track A
/A	Track A inverse
B	Track B
/B	Track B inverse
+5V_E	+5 V power supply for sinusoidal and TTL encoders
GND	Ground
+24V_E	+24 V power supply for HTL-encoder
◌	Shielding

5.13.3 X-ENC9 pin assignment

1	A	Track A
2	B	Track B
3	-	N.C.
4	+5V_E	+5 V power supply for sinusoidal and TTL encoders
5	DGND	Ground
6	/A	Track A inverse
7	/B	Track B inverse
8	/FAULT	reserved
9	DGND	Ground

5.13.4 Encoder connection to terminal X-ENC8

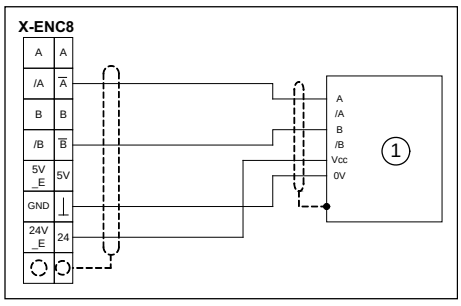
TTL incremental encoder (5V), sine encoder (1Vss)



TTL encoder (30V)

1 TTL- or sine encoder

HTL encoder



HTL encoder connection

1 HTL-encoder

Information

Pay attention to correct connection of the signal tracks when connecting HTL encoders!

- signal A ⇔ input /A
- signal B ⇔ input /B

5.14 Encoder connection synchronous motors (X-ENC15)

Information

For operating synchronous motors, the frequency inverter must be equipped with the right optional board to suit the encoder type used!

- Absolute value encoder with EnDat or SSI interface: optional board EM3-ENC-SYN-ZA (art. no. 357105)
- Absolute value encoder type ERN1387 (not for ZETADYN 3C-MRL): Options board EM3-ENC-SYN-01 (art. no. 357116)

CAUTION!

Caution!

The SUB-D jack X-ENC15 pin assignments are not standardized. When using external encoders, make sure that they have the identical contact assignments and an interface with identical specifications.

CAUTION!

Caution!

Before the impulse encoder can be plugged in or connected, the encoder type and the encoder resolution need to be parameterized in the **"Encoder & BC/ENC_TYP"** and **"Encoder & BC/ /ENC_INC"** menu.

```
Encoder & BC
↳ENC_Typ EnDat/SSI
  ↳      EnDat/SSI
Encoder Typ
```

```
Encoder & BC
↳ENC_Inc 2048
  ↳      2048
Encoder resolution
```

5.14.1 Technical data X-ENC15

Encoder types	Absolute value encoder with EnDat or SSI interface Absolute value encoder type ERN1387 (not for ZETADYN 3C-MRL):
Encoder resolution	512 ... 4096 pulse / revolution
Input resistor	120 Ω
Cut-off frequency	200 kHz
Sine differential signal (at 2.5 V offset against GND)	0,6 Vss ... 1,2 Vss (typ. 1Vss)
Connection cable	Shielded twisted pair cable
Max. cable length	25 m

5.14.2 Pin assignment X-ENC15 for absolute value encoder with EnDat/SSI interface

1	DATA	Data line for communication with the absolute encoder
2	/DATA	Data line inverse
3	U+ sens	Sensor cable for encoder voltage (positive)
4	+5V_REG	Controlled +5 V power supply (With missing encoder the power supply is switched off)
5	DGND	Ground power supply absolute encoder
6		not connected
7	B	Analog track B
8		not connected
9	/CLK	Clock signal invers
10	CLK	Clock signal for serial transfer
11	U- sens	Sensor cable for encoder voltage (negative)
12	A	Analog track A
13	/A	Analog track A inverse
14	/B	Analog track B inverse
15	GND_A_B	Ground for internal shielding
Housing		Shielding

5.14.3 Pin assignment X-ENC15 for absolute value encoder type ERN1387 (not for ZETADYN 3C-MRL)

1		not connected
2		not connected
3	U+ sens	Sensor cable - encoder voltage
4	+5V_REG	Controlled +5 V power supply (With missing encoder the power supply is switched off)
5	DGND	Ground power supply absolute encoder
6	/C	Analog track C inverse
7	B	Analog track B
8	C	Analog track C for transmitting position
9	/D	Analog track D inverse
10	D	Analog track D for transmitting position
11	U- sens	Sensor cable - encoder voltage
12	A	Analog track A
13	/A	Analog track A inverse
14	/B	Analog track B inverse
15	GND_A_B	Ground for internal shielding
Housing		Shielding

5.15 Simulating interruption of the encoder line during the acceptance by Technical Control Board

The simulation of the interruption of an encoder line can be practically implemented by pulling the encoder line plug during travel and then plugging it back in after the inspection has been completed. It is always possible to unplug and plug back in all sinusoidal, incremental and absolute rotary encoders with the frequency inverter switched on.

Information
If the encoder is plugged back in when the controller is switched on, it will not be recognized by the frequency inverter.
To recognize the encoder, the device must be switched off and then back on.

The following procedure is recommended to check the behavior of the frequency controller when the encoder line is interrupted:

- Switch on the frequency inverter
- Apply a travel command
- Pull the encoder line during the drive
- Behavior of the frequency inverter during fault
- Switch off the frequency inverter and wait for at least 3 minutes until the device is completely voltage free
- Plug the encoder line back in

5.16 Artificial encoder (X-ENCO)

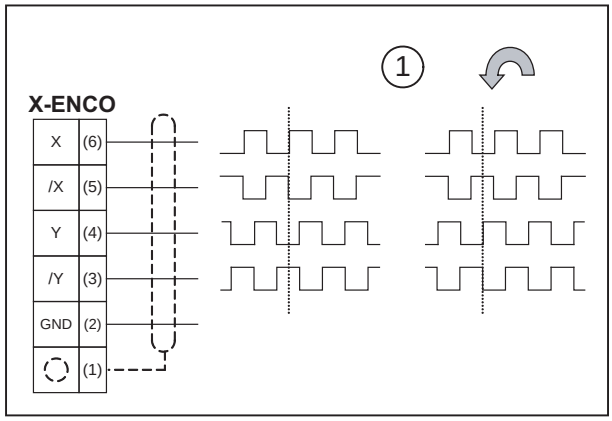
The artificial encoder converts the signals of the encoder attached to the motor into differential signals according to ANSI Standard RS422. The resolution of the artificial encoder is identical with the encoder resolution.

Information
When connecting an external 24V voltage source to terminal X-EXT, the artificial encoder remains active even if the frequency inverter is switched off

5.16.1 Technical data X-ENCO

Output signal high	min. 2,8 V / 8 mA
Output signal low	max. 0,4 V / 4 mA
Rload	≥ 120 Ω
Short-circuit-proof	no
Connection cable	Shielded twisted pair cable
Clamping range	max. 1,5 mm²

5.16.2 Connection X-ENCO



Artificial encoder connection

1 Signals depending on the rotating direction of the motor (with view to the power take-off side)
() terminal designation of connector

5.17 External 24V power supply (X-EXT)

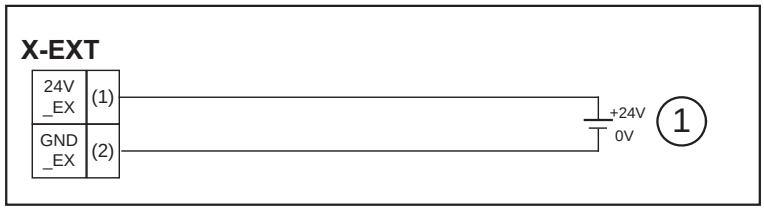
By applying an external 24V power supply to terminal X-EXT, the following functions are active even when the frequency inverter is switched off:

- Communication between the control system and the frequency inverter
- Artificial encoder
- ZETAPAD (parameter changes is possible)
- USB interface of the ZETAPAD

5.17.1 Technical data

Voltage range	23 ... 26 V
Current consumption	max. 625 mA

5.17.2 Connection X-EXT



Connection external power supply

1 external power supply
() terminal designation of connector

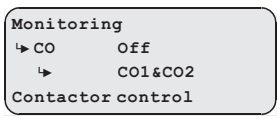
5.18 Monitoring the motor contactors(X-CO)

The frequency inverter monitors the switching status of the motor contactors. The contactors must be applied during travel. Opening the contactors during travel (e.g. through chatter) leads to an immediate travel abort.

CAUTION!

Operating gearless motors is only permissible with connected and activated contactor monitoring!

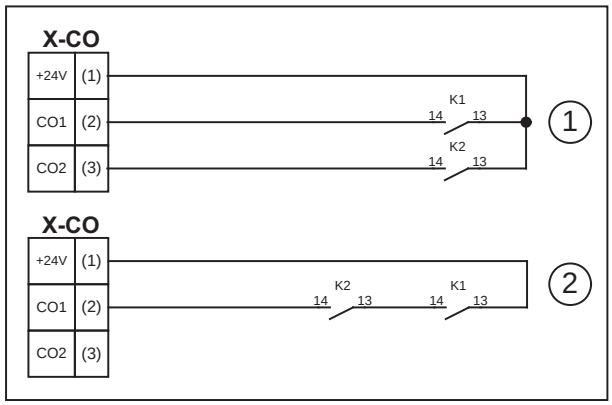
The contactor monitoring can be activated/deactivated in the **Monitoring/CO** menu.



5.18.1 Technical data

Monitoring voltage	+24 VDC / 12 mA
Contact type	Normally open contact (NO)
Number of inputs	2
Clamping range	max. 1,5 mm²

5.18.2 Connection



Contactor monitoring connection

1 Parameter "Monitoring/CO=CO1&CO2"
2 Parameter "Monitoring/CO=CO1"
() terminal designation of connector

CAUTION!

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

Information
The frequency-inverter contactor monitoring does not substitute the motor contactors required by EN 81-1!

5.19 Brakes

5.19.1 Brake release monitoring (X-BR)

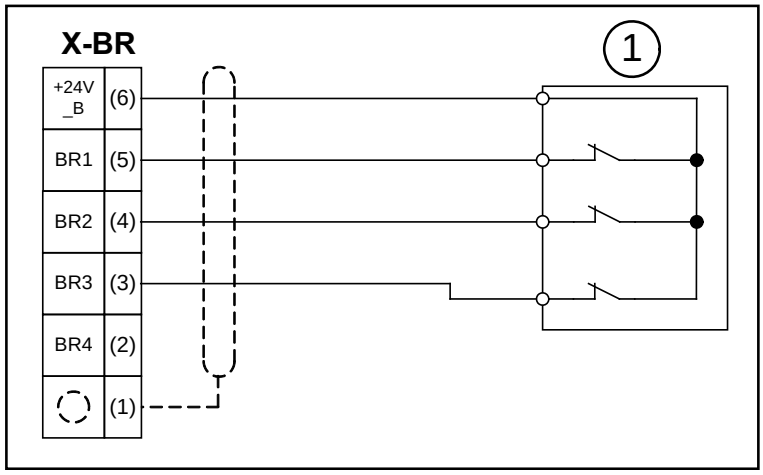
Information
The brake release monitoring serves as monitoring for redundancy and the operation status of the brakes.
It is recommended to connect the brake air monitor to the ZETADYN 3 for optimum starting and stopping.
The monitoring conforms 9.10 of EN81-1:2010 for brakes as protection for the upside traveling elevator car against overspeed.
The brake release monitoring does not conform to the requirements according to 9.11.3 of EN81-1:2010 for brake elements to protect against unintendend movement of the car.

Monitoring voltage	+24 VDC / 12 mA
Contact type	Normally open contact (NO) or normally closed contact (NC)
Number of inputs	4
Clamping range	max. 1,5 mm²

The contactor monitoring can be activated/deactivated in the menu **Monitoring**

```
Monitoring
↳ BR      1*NC
  ↳       3*NC
Brake control (BR1..BR4)
```

5.19.2 Connection X-BR



Brake release monitor connection

1 Monitoring contacts
() terminal designation of connector

CAUTION!

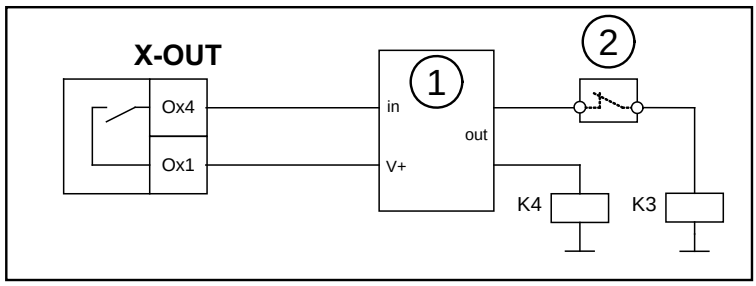
Caution!
The internal 24V power supply is provided solely for the brake release monitoring. Switching consumer load with this voltage is prohibited!

5.19.3 Triggering of the brakes

The signal for controlling the brakes is provided via a zero potential digital output (see "Digital outputs"). This normally open contact can be used either by the control for further processing or directly for switching the brake contactor (see fig.).

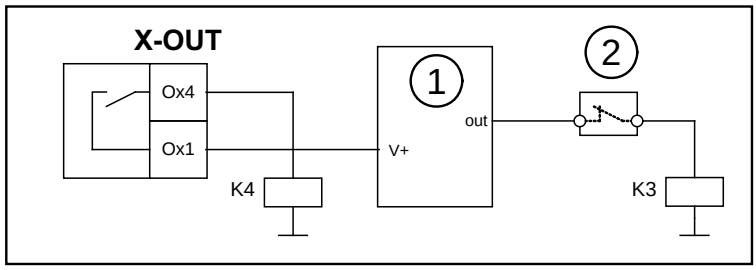
Information
To achieve optimum travel and position behavior, the brakes must be **instantaneously** opened and closed via this contact!

To reduce noises during brake disconnect, during normal operation the brakes should be switched to the alternating current side (K4). The brakes are switched-off slower and thus quieter through the rectifier.
To ensure instantaneous brake application in emergencies, during inspection drives and return rides, use a second contactor (K3), which disconnects the brakes from the direct current side. Integrate this contactor into the safety circuit.



Activating the brakes by the control system

1 Control system
2 Safety circuit

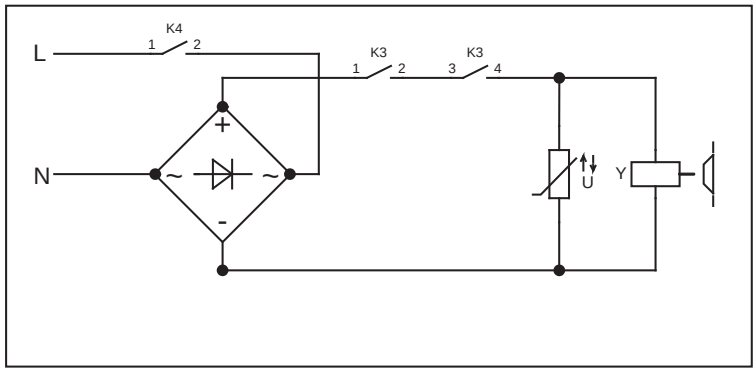


Activating the brakes by the frequency inverter and control system

1 Control system
2 Safety circuit

CAUTION!

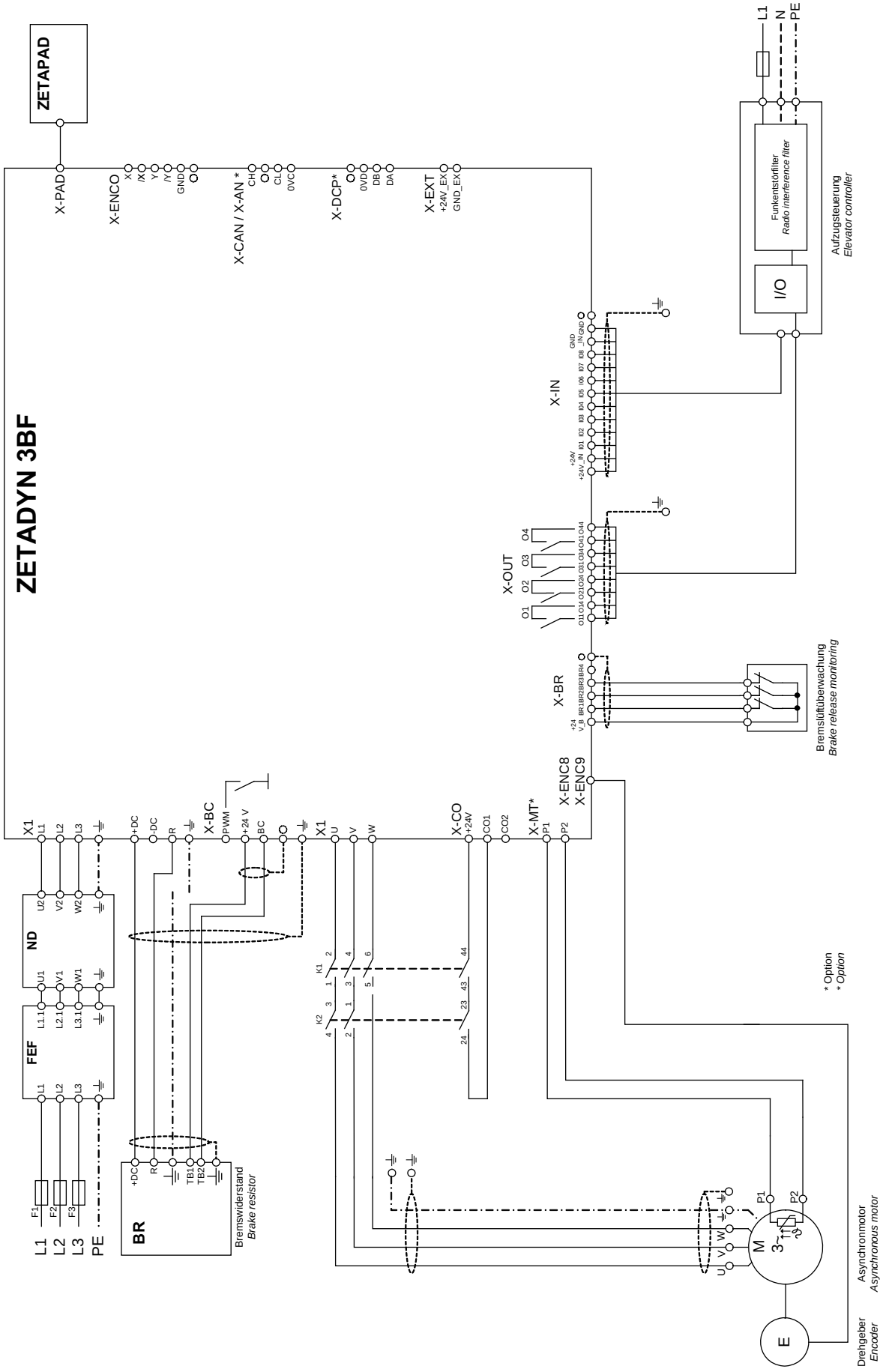
Caution!
Brakes, which are connected to the direct current side, must be protected against excess voltage from the switching actions by using corresponding varistors!
Due to the high operating current, master contactors must be used to switch the brakes!



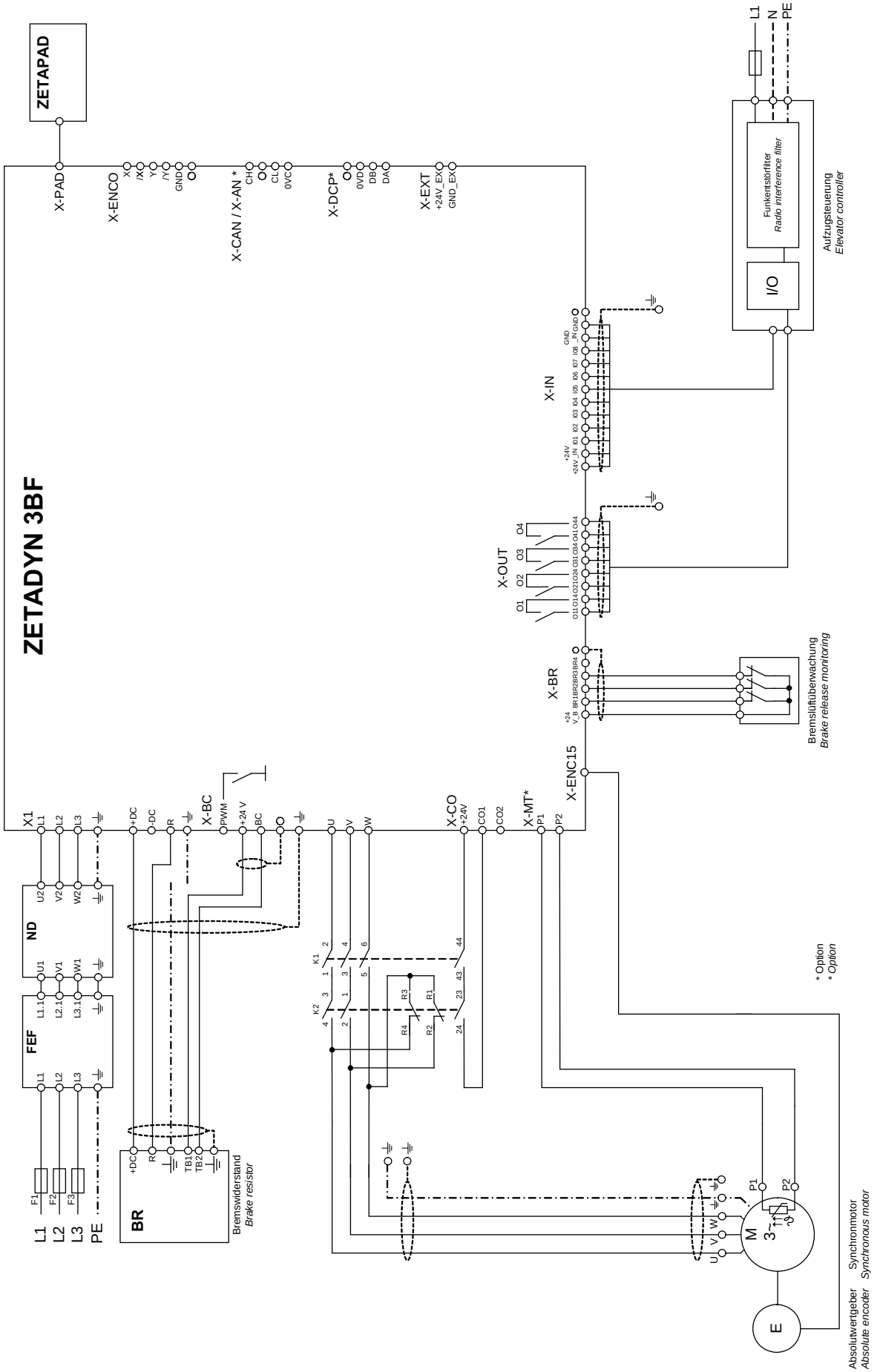
Simplified diagram for brake activation

The contacts from K3 must close before the contact from K4 and are only permitted to open after the contact from K4 has opened.

5.20 Connection suggestion ZETADYN 3BF (asynchronous motor)



5.21 Connection suggestion ZETADYN 3BF (synchronous motor)



6 Accessories

6.1 Brake resistor

During alternator operation, an electrical voltage is generated by the motor. This voltage is loaded into the frequency converter's intermediate circuit. To ensure that the voltage at the intermediate circuit capacitors does not exceed a limit value of approx. 760V, it is monitored. When the trigger voltage of approx. 680V is reached, the brake chopper or brake resistor is activated and the power generated in the alternator is converted to heat.
As an option the created energy can be fed back to the mains power supply (e.g. with a Revcon power feedback unit).

6.1.1 Brake-Resistor (BR)

The required control electronics are integrated in the frequency inverter.

6.1.2 Technical data

		BR11-A	BR17	BR25	BR50	BR100
Electrical data						
Resistor	[Ω]	64	41	28	14	7
Max. supply voltage	[V]	760				
Max. peak current with 700 V	[A]	11	17	25	50	100
Max. on time with peak breaking power at 120 s cycle time duration	[s]	-	10		8	6
Max. on time with peak breaking power at 15 s cycle time duration	[s]	-	1,5		1,4	1,3
Max. peak-braking power	[kW]	7,7 vertical 6,16 horizontal	11,9	17,5	35	70
Continuous braking power	[kW]	0,7 vertical 0,56 horizontal	1,75		3,3	6,5
Trigger voltage	[V]	-				
Trigger-value temperature monitoring	[°C]	-	137 ±4K			125 ±4K
Cooling		Convection				
Ambient conditions						
Ambient conditions operation	[°C]	0 ... +40				
Ambient conditions storage	[°C]	-20 ... +80				
rel. humidity	[%]	90				
Max. installation height	[m]	2000*				
Protection class		IP50	IP20			
Physical conditions						
Dimensions w x h x d	[mm]	225 x 124 x 115	300 x 230 x 185		560 x 230 x 185	560 x 414 x 185
Weight	[kg]	1,25	2,6		4,8	8,5
Max. lenght connection cable	[m]	1,0	5,0			

* *above 1000 m with power reduction of 1 % / 100 meters height*

6.1.3 Mechanical installation

Danger!
When the device is overloaded, the air temperature can reach up to 400 °C at a distance of 200 mm. Remaining in this area can lead to severe burns. You must take appropriate precautions.

CAUTION!

Caution!
Due to the high amount of heat generation, it is only permissible to install the device outside of the switch cabinets! The devices must not be mounted on flammable surfaces

CAUTION!

Caution!
The brake resistor cooling must not be impaired by the vents becoming covered. A fire hazard exists if covered with flammable materials!

CAUTION!

Caution!
Additional device cooling through external fans is prohibited because this would impact the reaction characteristics of the temperature monitoring.

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

Before installation

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

During installation

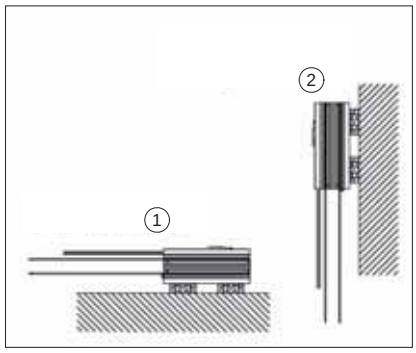
- Mount the device in a torsion free conditions
- Mount the device in a torsion free conditions
- avoid that drilling chips, screws and other foreign bodies reach the interior of the device
- Installation position: horizontal, connection terminals at bottom; no horizontal assembly
- Maintain the stated minimum clearances to ensure unobstructed cooling- air feed as well as unobstructed outgoing air discharge

Ambient conditions

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

Installation position
Type BR11-A

- to preventgetting in contact with the hot surface, the brake resistor has to be mounted in a high of **min. 2m** or it has to be mounted with a protection against contact
- Horizontal or vertical installation position
- With vertical installation positions the cables must face downwards
- Maintain the minimum clearances to ensure unobstructed cooling- air feed as well as unobstructed outgoing air discharge!

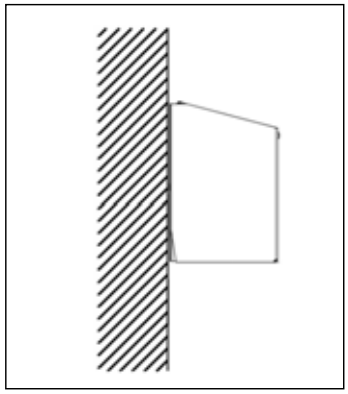


Installation position BR11-A

1 horizontal installation position with power reduction
2 vertical installation position

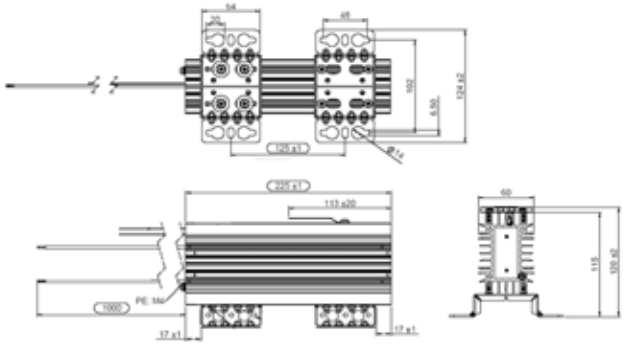
Type BR17 / BR25 / BR50 / BR100

- Installation position: horizontal, connection terminals at bottom; no horizontal assembly
- Maintain the minimum clearances to ensure unobstructed cooling- air feed as well as unobstructed outgoing air discharge!

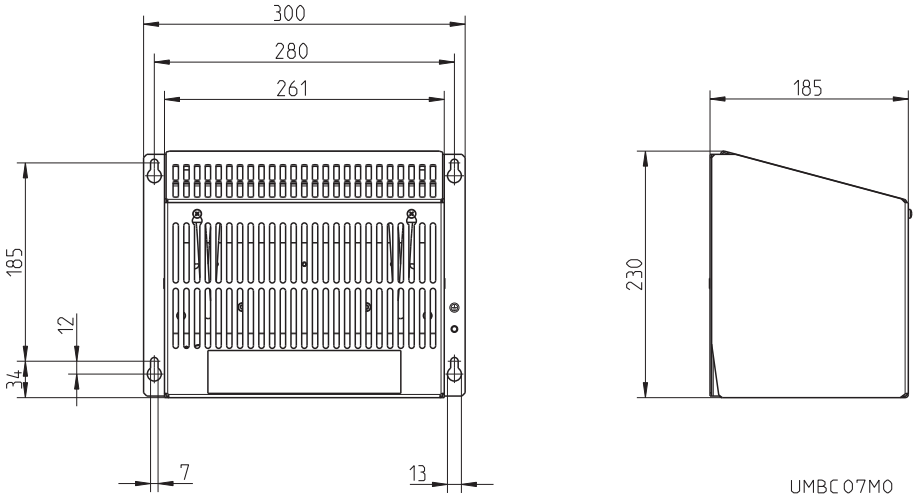


Installation position BR17 / BR25 / BR50 / BR100

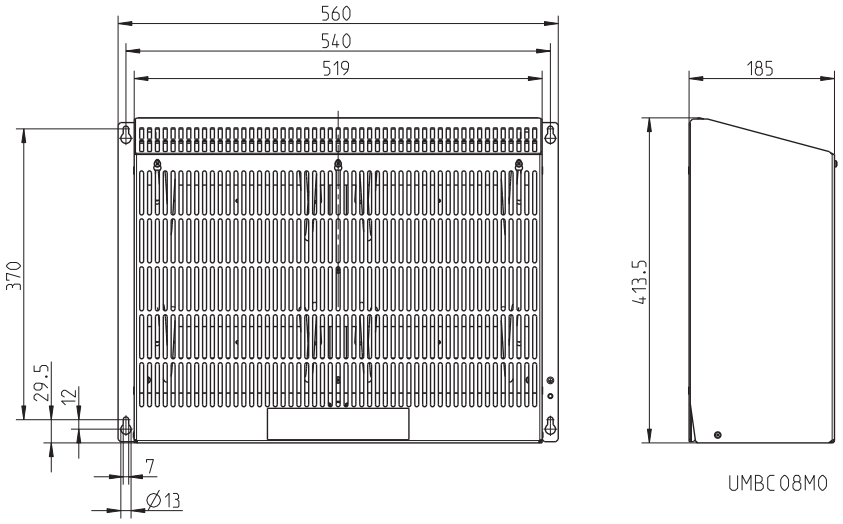
6.1.4 Dimensions



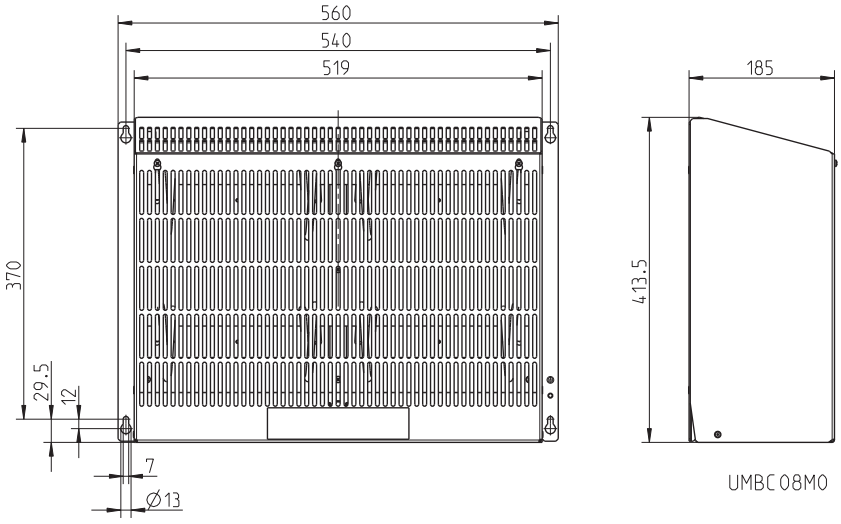
Dimensions BR11-A



Dimensions BR17 / BR25

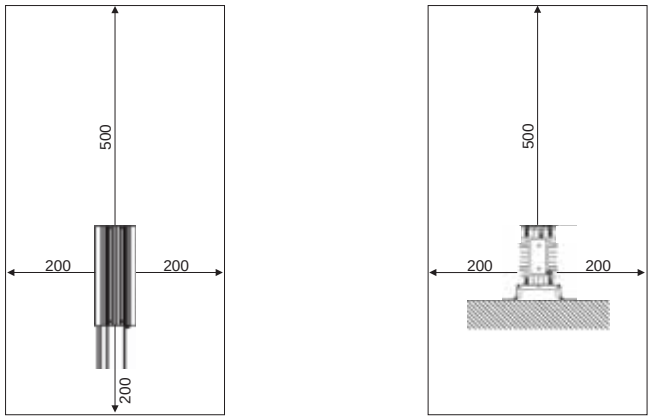


Dimensions BR50

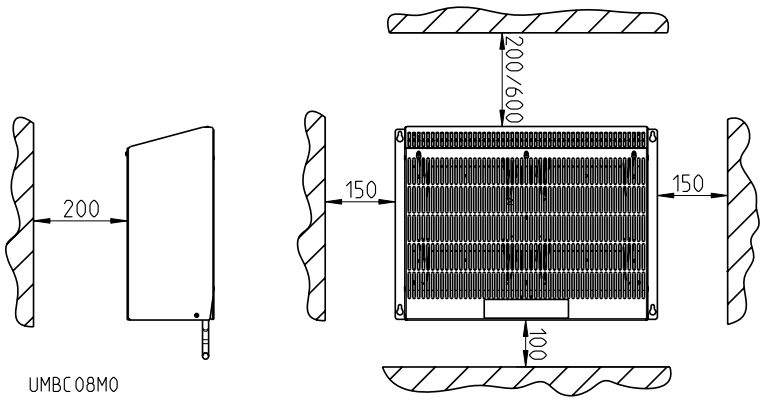


Dimensions BR100

6.1.5 Minimum clearances



Minimum clearances BR11-A vertical / horizontal



Minimum clearances BR17 / BR25 / BR50 / BR100

CAUTION!

Minimum clearances Typ BC / BR:
200 mm to non flammable materials (fire classification A1 according to EN 13501-1)
600 mm to materials of low flammability without smoke emission and without burning dripping (fire classification B, C-s1 do according to EN 13501-1)

6.1.6 Electrical connection

Danger!
It is forbidden to work on the frequency converter under voltage (electrically alive). Even after disconnection, the DC-link (terminals X1:+DC / X1:-DC) is still live.

Wait at least 3 minutes before working on the device

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

Work on electric components may only be carried out by trained electricians or by persons instructed in electricity under the supervision of an electrician in accordance with electrical engineering regulations.
A second person must always be present when working on energized parts or lines who disconnects in case of emergency.

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

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

Never clean electrical equipment with water or similar liquids.

CAUTION!

Caution!
An existing temperature monitor absolutely must be connected to the frequency inverter! Otherwise, the device could burn up during a malfunction!

CAUTION!

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

CAUTION!

Caution!
The brake resistor or brake chopper used must be configured in the menu **Encoder & BC /BC_TYP**.

```
Encoder & BC
↳ BC_TYP  BR25
  ↳       BR25
BR/BC - Typ
```

Selecting cables
Type BR11-A
The brake resistor of the type BR11-A is equipped with prefabricated cables. These must be wound around the delivered toroidal core (see fig.).

Toroidal core BR11-A

Type BR17 / BR25 / BR50 / BR100
Always use shielded cables for the connection!

Due to the short load duration, the cable cross-section is not dependent on the Brake-Chopper / Brake resistor peak braking current.

Allocating the conductor cross section to the frequency inverter

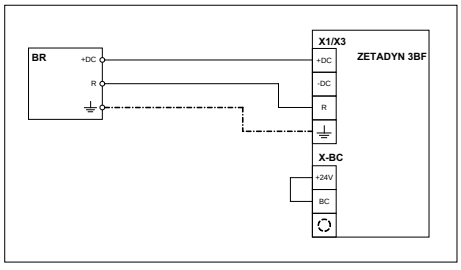
Inverter	Line cross-section	Article-No.
ZETADYN 3BF011 ZETADYN 3BF013 ZETADYN 3BF017 ZETADYN 3BF023	2,5 mm²	00164178 (3,0 m) 00164182 (5,0 m)
ZETADYN 3BF032 ZETADYN 3BF040 ZETADYN 3BF050 ZETADYN 3BF062 ZETADYN 3BF074	6,0 mm²	00164180 (3,0 m) 00164183 (5,0 m)
ZETADYN 3BF110 ZETADYN 3BF180	16,0 mm²	00165724 (3,0 m) 00165725 (5,0 m)

In cables purchased from Ziehl-Abegg, the control lines for temperature monitoring are already integrated.

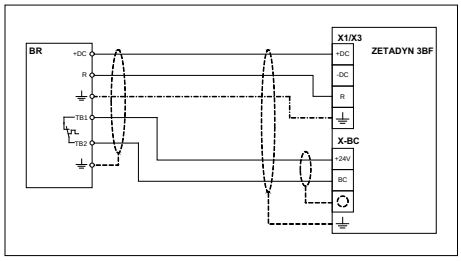
Cable lengths
The maximum line length is 5 m.
When lines over >5m are used, compliance with **EN 12015** (electromagnetic compatibility – electrical interference) and **EN 12016** (electromagnetic compatibility – noise immunity) is no longer guaranteed.
If the pre-fabricated cable is not long enough in the brake resistor of the BR11-A type, this can be extended up to a length of 5 m.
A shielded, self-extinguising cable is required for this.

Brake-Resistor connection

Information
The brake resistor of the BR11-A type has no temperature monitor.
An electrical connection must be made at the ZETADYN 3BF between XBC:+24V and XBC:BR (see fig.)!



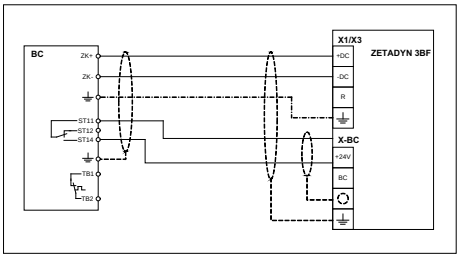
BR11-A connection



Installation position BR17 / BR25 / BR50 / BR100

1 Max. contact load: 5 A / 250 VAC

Brake-Chopper connection



BC25 / BC50 connection

1 Max. contact load: 5 A / 250 VAC

6.1.7 Allocation of Brake-Chopper / Brake-Resistor

Inverter	Brake-Chopper Brake resistor	Article-No.
ZETADYN 3__011	BR11-A BR17	357171 357216
ZETADYN 3__013	BR17 BC25	357216 357031
ZETADYN 3__017	BR17 BC25	357216 357031
ZETADYN 3__023	BR25 BC25	357217 357031
ZETADYN 3__032	BR25 BC25 BR50 BC50	357217 357031 357218 357032
ZETADYN 3__040	BR50 BC50	357218 357032
ZETADYN 3__050	BR50 BC50	357218 357032
ZETADYN 3__062	BR50 BC50	357218 357032
ZETADYN 3__074	BR50 BC50 BR100-A BC100	357218 357032 357214 357033
ZETADYN 3__110	BR100-B	357215
ZETADYN 3__180	BR100-B	357215

6.2 Line reactor and radio interference filter

6.2.1 Technical data line reactor and radio interference filter

Line reactor type ND011 - ND040

		ND011	ND013	ND017	ND023	ND032	ND040
Electrical data							
Mains connection voltage	[V]	3~ 400 ±10 %					
Mains frequency	[Hz]	50 / 60					
Rated current for 25 % duty cycle	[A]	11	13	17	23	32	40
Rated current for 30 % duty cycle	[A]	-	-	-	-	-	-
Ambient conditions							
Ambient conditions operation	[°C]	40					
Protection class		IP00					
Physical data							
Dimensions w x h x d	[mm]	125x135x61	125x135x71	125x135x71	155x160x80	155x170x95	190x200x85
Weight	[kg]	2,0	2,5	2,5	4,0	5,0	6,5

Line reactor type ND050 - ND180

		ND050	ND062	ND074	ND110	ND180
Electrical data						
Mains connection voltage	[V]	3~ 400 ±10 %				
Mains frequency	[Hz]	50 / 60				
Rated current for 25 % duty cycle	[A]	-	13	17	-	-
Rated current for 30 % duty cycle	[A]	50	-	-	110	180
Ambient conditions						
Ambient conditions operation	[°C]	40				
Protection class		IP00				
Physical data						
Dimensions w x h x d	[mm]	190x200 x68	190x200 x120	190x200 x120	230x280x150	230x350x150
Weight	[kg]	8,0	9,0	10.0	14	21

Radio interference filter FEF011KK4D - FEF050KK4D

		FEF011KK4D	FEF023KK4D	FEF040KK4D	FEF050KK4D
Electrical data					
Mains connection voltage	[V]	3~ 480 +10 %			
Mains frequency	[Hz]	50 / 60			
Rated current for 30 % duty cycle	[A]	11	23	40	50
Ambient conditions					
Ambient conditions operation	[°C]	-25 ... +85			
Protection class		IP20			
Physical data					
Terminal cross-section	[mm²]	4.0		10.0	16,0
Dimensions w x h x d	[mm]	40x190x70	45x250x70	50x270x85	85x258x90
Weight	[kg]	0,7	1,0	1,4	1,5

Radio interference filter FEF074KK4D - FEF180KK4D

		FEF074KK4D	FEF180KK4D
Electrical data			
Mains connection voltage	[V]	3~ 480 +10 %	
Mains frequency	[Hz]	50 / 60	
Rated current for 30 % duty cycle	[A]	74	180
Ambient conditions			
Ambient conditions operation	[°C]	-25 ... +85	
Protection class		IP20	
Physical data			
Terminal cross-section	[mm²]	16,0	95.0
Dimensions w x h x d	[mm]	85x258x90	130x450x180
Weight	[kg]	2,0	6,0

6.2.2 Mechanical installation

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

Before installation

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

During installation

- Mount the device in a torsion free conditions
- Mount the device in a torsion free conditions
- avoid that drilling chips, screws and other foreign bodies reach the interior of the device

Ambient conditions

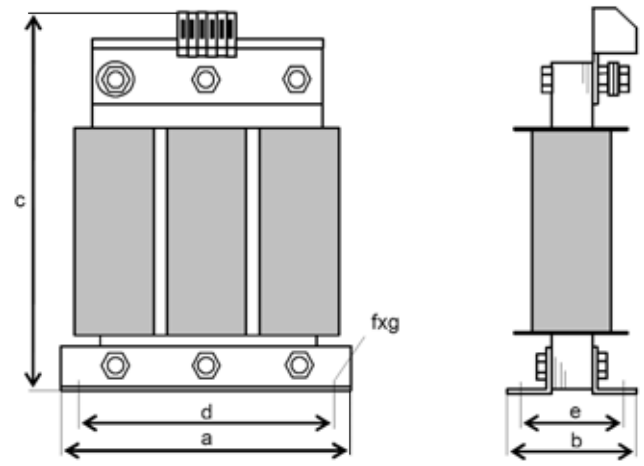
- mounting the device on vibrating components is not allowed
- the device must not be exposed to any shock
- Prevent humidity
- Avoid aggressive and conductive materials in the environment

6.2.3 Switch cabinet installation

Information
To comply with the EMC-directives following has to be observed:

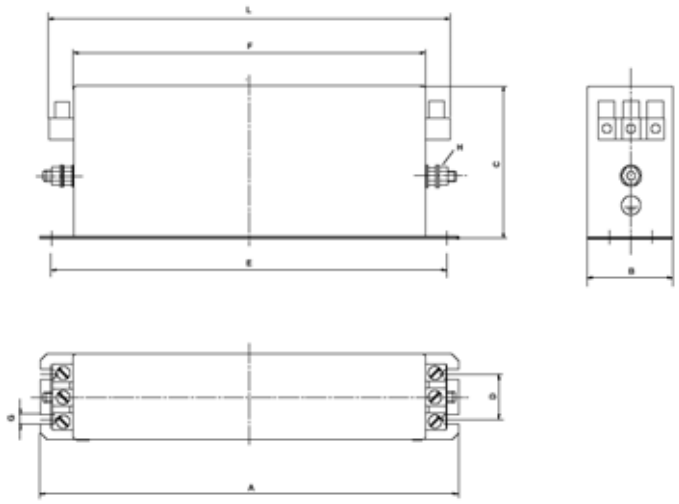
Radio interference supression filter type FEF and power choke type ND:
The cable length between the FEF type radio interference suppression filter and the ND type power choke and the power choke and frequency converter may not exceed **a maximum of 200 mm** !

6.2.4 Dimensions



Dimensions power choke ND

	Dimensions [mm]					
	a	b	c	d	e	fxg
ND011	125	61	135	100	45	5x8
ND013	125	71	135	100	55	5x8
ND017	125	71	135	100	55	5x8
ND023	155	80	160	130	57	8x12
ND032	155	95	170	130	72	8x12
ND040	190	85	200	170	58	8x12
ND050	190	120	200	170	68	8x12
ND062	190	120	200	170	78	8x12
ND074	190	120	200	170	78	8x12
ND110	230	150	280	180	120	8x12
ND180	230	150	305	180	122	9x12



Dimensions radio interference filter FEF

	Dimensions [mm]								
	A	B	C	D	E	F	G	H	L
FEF011KK4D	190	40	70	20	180	160	5,4	M5	185
FEF023KK4D	250	45	70	25	235	220	5,4	M5	245
FEF040KK4D	270	50	85	30	255	240	5,4	M5	265
FEF050KK4D	250	85	90	60	235	220	5,4	M6	258
FEF074KK4D	250	85	90	60	235	220	5,4	M6	258
FEF180KK4D	380	130	180	102	365	350	6.5	M10	450

6.2.5 Electrical connection

Warning!
It is forbidden to work on the frequency converter under voltage (electrically alive). Even after disconnection, the DC-link (terminals X1:+DC / X1:-DC) is still live.

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

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

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

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

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

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

Never clean electrical equipment with water or similar liquids.

Selecting cables

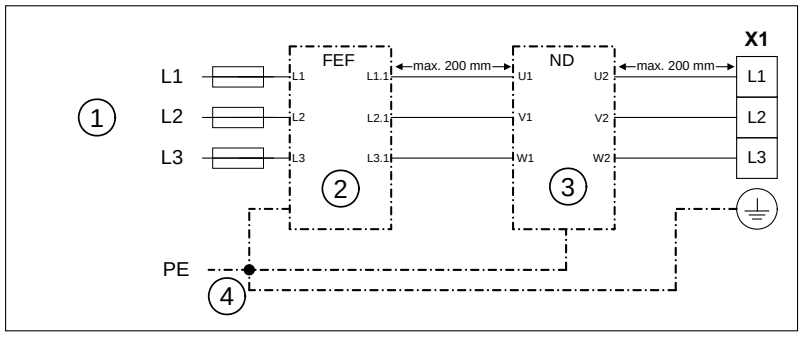
Line reactor ND and radio interference filter FEF

Both rigid and flexible lines can be installed. The use of wire-end sleeves is recommended for flexible lines. The line cross-section must be specified dependent on the motor's rated current and the ambient conditions (e.g. temperature, wiring method) in accordance with DIN VDE 0100.

Cable lengths

The maximum line length when using non-shielded lines is **200mm**. If there is a greater distance between the choke-module and the frequency inverter, you must use shielded lines

Connection



Connection of the line reactor ND and the radio interference filter FEF

1 Mains 3~ 400V/PE/50Hz
2 Radio interference filter FEF
3 Line reactor ND
4 Central ground point

6.2.6 Allocation of the line reactor-radio interference filter to the frequency inverter

Inverter	Line reactor	Radio interference filter	Article-No.
ZETADYN 3BF011	ND011 -	- FEF011KK4D	357180 357192
ZETADYN 3BF013	ND013 -	- FEF023KK4D	357181 357176
ZETADYN 3BF017	ND017 -	- FEF023KK4D	357182 357176
ZETADYN 3BF023	ND023 -	 FEF023KK4D	357183 357176
ZETADYN 3BF032	ND032	 FEF040KK4D	357184 357177
ZETADYN 3BF040	ND040	 FEF040KK4D	357185 357177
ZETADYN 3BF050	ND050 -	- FEF050KK4D	357186 357178
ZETADYN 3BF062	ND062 -	- FEF074KK4D	357187 357179
ZETADYN 3BF074	ND074 -	- FEF074KK4D	357188 357179
ZETADYN 3BF110	ND110 -	- FEF180KK4D	357196 357199
ZETADYN 3BF180	ND180 -	- FEF180KK4D	357197 357199

6.3 Operating terminal ZETAPAD

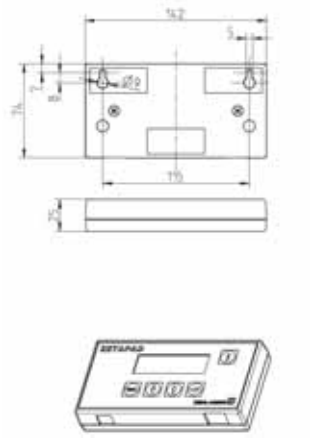
The ZETAPAD is an operating module that is independent of the frequency inverter. It can be used to operate and configure all ZETADYN 3 type frequency inverters.
When using longer connection lines, remote control of the frequency inverter is feasible.

6.3.1 Mounting / fixing

The fastening takes place with the provided magnetic stripes, which will be affixed to the back-side, on the front-side of the frequency inverter and all magnetisable surfaces.
Two keyhole notches are available on the rear for mounting the ZETAPAD to non-magnetic surfaces (see Fig.).

6.3.2 Dimensions

Mounting ZETAPAD to ZETADYN 3



ZETAPAD dimensions

6.3.3 Connection

The connection has to be effected on the RJ45-female plug of the operating terminal and the ZETADYN 3 (X-PAD).

Connection cable

CAT5 network cable, 8-core
both sides RJ-45 plug, 8-pole
max. length of the cable: 50 m
line cross-section >= AWG26

ZETAPAD connection

7 Operation and parameterising

7.1 Possibilities for operation and configuration

The following can be performed with the aid of the various operating facilities:

- The parameters needed for commissioning can be set
- Simple measurement and control functions can be carried out
- Service conditions can be recorded

7.1.1 Operating terminal ZETAPAD

The ZETAPAD is an operating module independent of the frequency inverter. It can be used to operate and configure frequency inverters of the ZETADYN 3 type and evacuation modules of the EVAC 3 type.

7.1.2 Remote control via ZETAMON software

When the ZETAMON software is used the frequency converter can be operated by a PC / Notebook (see chapter "ZETAMON Software").

7.1.3 Remote control via the elevator controller display

Prerequisite is an elevator control system which supports the DCP protocol or CANopen lift protocol as well as an existing connection between frequency converter and elevator control system. Please see the elevator control system operating manual for information on operating the converter via the elevator control system.

7.2 Menu navigation

Information
The menu navigation for the ZETAPAD and ZETAMON operating facilities is uniform! Please inform yourself about navigation with an elevator control by using the corresponding operating instructions!

Information
Modifying parameters is only possible when the machine is in standstill!

Operating interface ZETAPAD and ZETAMON

7.2.1 Menu and parameter navigation

Main page

```
 ZIEHL-ABEGG AG
ZETADYN 3CS011-D
 SN: 09229587/0002
Phone: +49 794016308
```

- Actuate with any key

Menu section

```
 ZETADYN 3
->Startup
 Statistic
 Memory Card
```

- Select required menu
Confirm menu selection

Parameter section

```
Startup
 USR_LEV Basic
->MOT_TYP SM250
 n 96 rpm
```

Parameter selection
- Confirming parameter values

Changing parameter

```
Startup
↳MOT_TYP SM225
  ↳      SM250
Motortype
```

- Enter / select parameter value.
- Confirm value

Control key functions

esc	• back to menu selection • Back to parameter selection • Negation of yes-no queries • Cancel
↵	• Confirming menu selection • Confirming parameter values • Confirming parameter values • Affirmation of yes-no queries
↑	• Menu selection • Parameter selection • Increasing parameter values
↓	• Menu selection • Parameter selection • Reducing parameter values
i	• Show / exit INFO menu • Display of current operational states

7.2.2 The various parameter levels

The firmware of the ZETADYN 3 is divided into two parameter levels:

Basic-Level

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

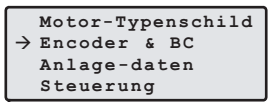
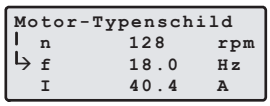
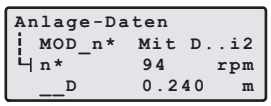
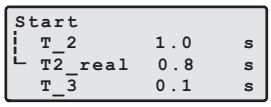
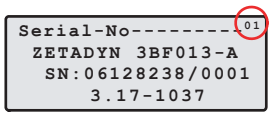
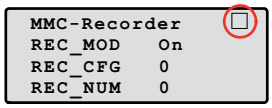
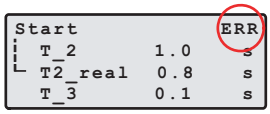
Advanced-Level

- In the Advanced-Level all parameters as described in chapter 10 "Parameter List" are displayed.
- Depending on the parameterisation, unneeded parameters are hidden automatically to give a better overview.

Information

- You can switch between Basic-Level and Advanced-Level by a long press of the ESC key.
- The level which is active after the controller start can be set by the parameter **LCD & Password / USR_LEV**.

7.2.3 Meaning of the arrows appearing in the display:

	→	Selecting a menus in the menu level
	↳	Selecting changeable parameters in the menu
	↳	Selected parameter can be modified, but is blocked at the moment. The block can be implemented by assigning a password or functionally (dependent on another parameter)
	↳	Value / function of a parameters is only displayed for informational purposes and cannot be modified.
	**i** **Zahl**	Current position (page number) in the INFO-menue
	□	The recorder for recording measurements on the memory card is activ
	**ERR**	Failure of the frequency inverter The device must be switched off

7.3 Entering numerical values

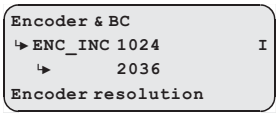
Entering numerical parameter values can be done using two different facilities:

7.3.1 Continuous change of a parameter value

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

Short keypress: Number is incremented/decremented by 1

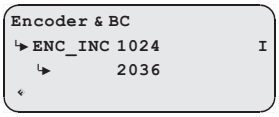
Long push on the key: Number automatically increases/decreases until the key is released.



7.3.2 Changing individual digits

When changing a parameter by a large value, it is possible to change the individual digits separately After selecting the parameter, use ⓘ to the select the desired digit and change from 0…9 with the ⓘ & ⓘ key

The selected digit is marked with an arrow.



8 Start-up

Danger!
Defective connections can cause the motor to start unexpectedly or lead to uncontrolled motor movements.
Reversed connections cause the motor to rotate in the wrong direction. That can cause serious machine damage.

CAUTION!

Caution!
Incorrectly wired connections can destroy the electrical / electronic components.
Electrostatic discharges can be hazardous to the electronic components and lead to errors in the software.

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

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

Information
This commissioning assumes the factory settings for the digital inputs and outputs, encoder inputs and monitoring contacts have not been modified!

Requirements for error-free commissioning:

- Mains line is connected
- Motor is connected
- Brake chopper or Brake resistor are connected
- Controller and monitoring inputs are connected
- Encoder is connected

8.1 Preconfigured inverter

Inverters preprogrammed by Ziehl-Abegg are provided with the following information plate on the faceplate

Information
Preset parameters
Preset paramters

In these units, the parameters are factory preset, based on customer specific information. Entering parameters is no longer necessary but the parameters must be checked before commissioning!

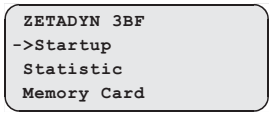
8.2 Switching on the frequency inverter

When the mains voltage is applied, the frequency inverter switches on after a self test. The display shows thefoll owing:

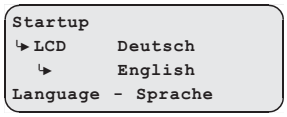
```
Ziehl-Abegg AG
ZETADYN 3BF
SN:12345678/123
Phone +49 794016308
```

8.3 Parameterization of the frequency inverter

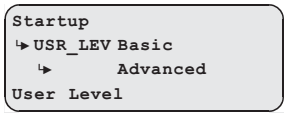
If the frequency inverter doesn't have preset parameters, you have to adjust the following parameters before start-up.



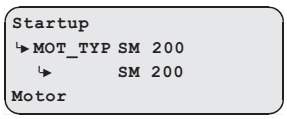
Select menu **"Startup"**



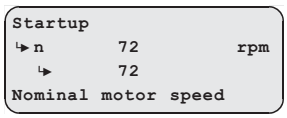
Select parameter **"LCD"**
Choose language
The languages German and English are integrated as standard. A third language can be loaded with the memory card.



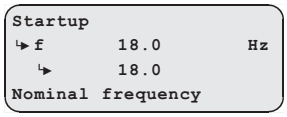
Select parameter **"USR_LEV"**
The level which is active after the controller start can be set by the parameter USR_LEV.



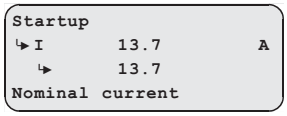
Select parameter **"MOT_TYP"**
Enter the operated motor type



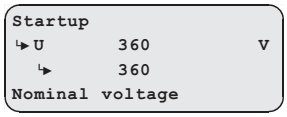
Select parameter **"n"**
Enter nominal speed of the motor



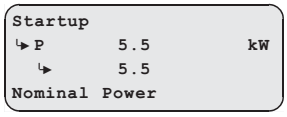
Select parameter **"f"**
Enter nominal frequency of the motor



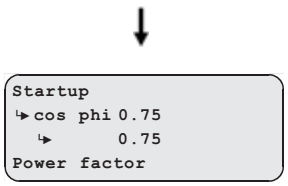
Select parameter **"I"**
Enter nominal current of the motor



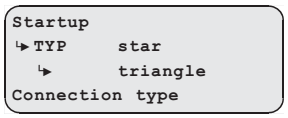
Select parameter **"U"**
Enter nominal voltage of the motor



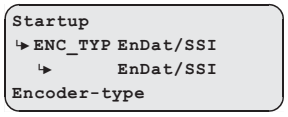
Select parameter **"P"**
Enter nominal power of the motor



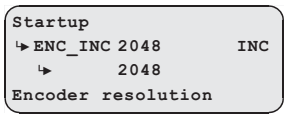
Select parameter **"cos phi"**
Enter power factor of the motor
A **Possible only for asynchronous motors**



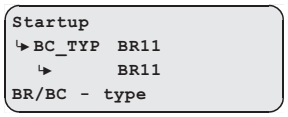
Select parameter **"TYP"**
Choose connection type of the motor



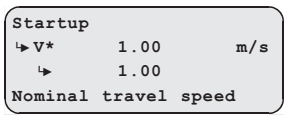
Select parameter **"ENC_TYP"**
Enter the type of encoder used



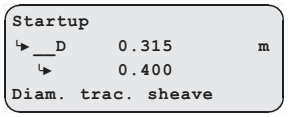
Select parameter **"ENC_INC"**
Enter the encoder resolution



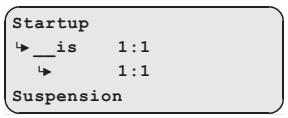
Select parameter **"BC_TYP"**
Enter the used brake resistor or brake chopper



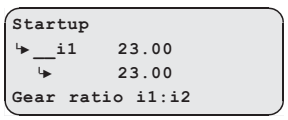
Select parameter **"V*"**
Enter the installation rated speed



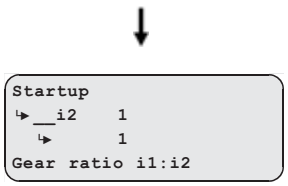
Select parameter **"__D"**
Enter the diameter of the traction sheave



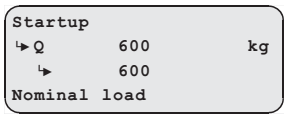
Select parameter **"__is"**
Enter the installation's type of suspension



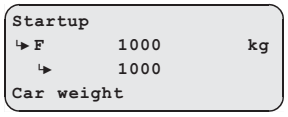
Select parameter **"__i1"**
Input of i1 of the gearbox ratio i1:i2
A **Possible only for asynchronous motors**



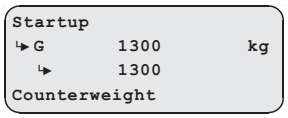
Select parameter **"__i2"**
Input of i2 of the gearbox ratio i1:i2
A **Possible only for asynchronous motors**



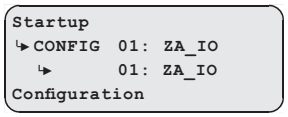
Select parameter **"Q"**
Enter the elevator installation's rated load



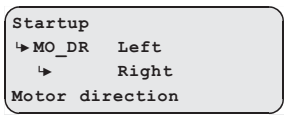
Select parameter **"F"**
Enter the car weight



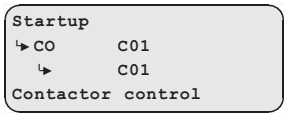
Select parameter **"G"**
Enter the counterweight



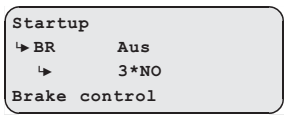
Select parameter **"CONFIG"**
Configuration of the digital inputs according to the used control system and type of communication



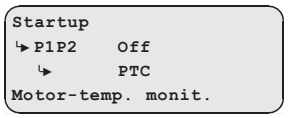
Select parameter **"MO_DR"**
Changing the rotating direction of the motor
It must be observed the with triggering the input RV1 the cabin drives upwards



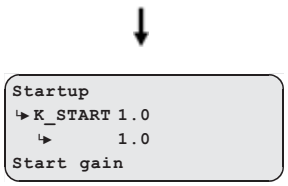
Select parameter **"CO"**
Definition of the contactor monitoring
The contactor monitoring has to be connected to the inverter obligatory!



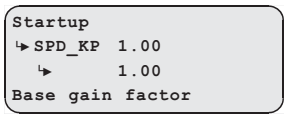
Select parameter **"BR"**
Definition of the brake monitoring



Select parameter **"P1P2"**
Motor temperature monitoring



Select parameter **"K_START"**
Start gain
Multiplicative factor for the parameter "Controller/SPD_KP"
Increasing the PI controller during the start-up



Select parameter **"SPD_KP"**
Multiplication factor to modify the calculated basic amplification SPD_C

8.4 Automatic operating-curves default

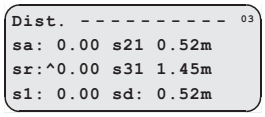
Using the automatic operating-curve defaults, the parameters responsible for operating curves and travel speeds are pre-assigned **dependent on the "installation nominal velocity "V*"**.
After changing the parameter **V***, you can confirm the request " automatic pre-signment?" with yes or no.
Preconfigured parameters through the automatic operating defaults:

"Acceleration" menu	"Deceleration" menu	"Travelling" menu
A_POS R_POS1 R_POS2	A_NEG R_NEG1 R_NEG2	V_2 V_3

8.5 Setting the switch-off points

8.5.1 Cut-off points for travel speed V_3

The deceleration paths V_3 to V_1 or V_3 to standstill (with DCP2 and DCP4 protocols) can be read out directly on the frequency inverter in the **info menu / page 03**.

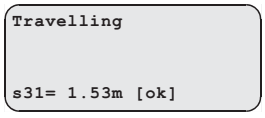


s31: Display of calculated deceleration path V_3 ◦ V_1 or V_3 ◦ Standstill

The following parameters influence the deceleration path:

- V_1 (Positioning speed)
- V_3 (Traveling speed)
- R_NEG1 (upper round-off)
- R_NEG2 (lower round-off)
- A_NEG (Deceleration)

When a parameter is changed, the newly calculated deceleration path is (s31) is indicated in the display after confirming the modification.



s31: Display of calculated deceleration V_3 ◦ V_1 or V_3 ◦ Standstill after modifying V_3

To have some leeway to optimize the travel behavior, the interrupt point is set - if possible – to a deceleration path larger than that, which was calculated.
The crawl path can be shortened later directly on the inverter in the **Decelerating / S_DI3** menu

To reach almost identical positioning in all floors, the interrupt points must be set with a precision of **± 1 cm**.

To reach almost identical positioning in all floors, the interrupt points must be set with a precision of **± 1 cm**.

8.5.2 Cut-off points for travel speed V_2

The deceleration paths V_2 to V_1 or V_2 to standstill (with DCP2 and DCP4 protocols) can be read out directly on the frequency inverter in the info menu / page 03.

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

s21: Display of calculated decelration path V_2 ◦ V_1 or V_2 ◦ Standstill

The following parameters influence the deceleration path:

- V_1 (Positioning speed)
- V_2 (Intermediate speed)
- R_NEG1 (upper round-off)
- R_NEG2 (lower round-off)
- A_NEG (Deceleration)

When a parameter is changed, the newly calculated deceleration path is (s21) indicated in the display after confirming the modification.

```
Travelling


s21= 0.86m [ok]
```

s21: Display of calculated deceleration V_2 ◦ V_1 or V_2 ◦ Standstill after modifying V_2

If the floor separation is smaller than the calculated deceleration path, the speed for V_2 must be decreased until the deceleration path is smaller than the floor separation.

8.5.3 Cut-off points for travel speed V_1

To prevent overshooting the flush alignment, the interrupt points V_1, dependent on the deceleration A_NEG, must be set between **2 and 5cm** before flush alignment. If the ride ends before alignment, the interrupt points need to be correspondingly adjusted. To reach almost identical positioning in all floors, the interrupt points must be set with a precision of **± 1 mm**.

8.6 Carrying out the first test run

Warning!
Operating synchronous motors without encoder offset can cause uncontrolled motor movements

With synchronous motors, an encoder-offset alignment must be carried out before the first trip (see “Special functions” chapter)! To perform the offset alignment, the motor must be in the idle state (no ropes on the traction sheave).
When a Ziehl-Abegg motor is purchased in connection with a frequency inverter, the offset alignment is already taken care of.
When using external motors, the offset must be performed as in the following (get information from the manufacturer): Connect motor winding to direct current: U ◦ + und V und W ◦ -. Offset value = 0

The first trip must be carried out with the return control or as an inspection trip.

If this trip can be carried out without any problems and without any fault messages, a normal trip can be made as the next step.

If fault messages appear, an error list is available in the “Diagnose” chapter together with the corresponding error causes

If you need support during commissioning or trouble shooting, we would be glad to help.

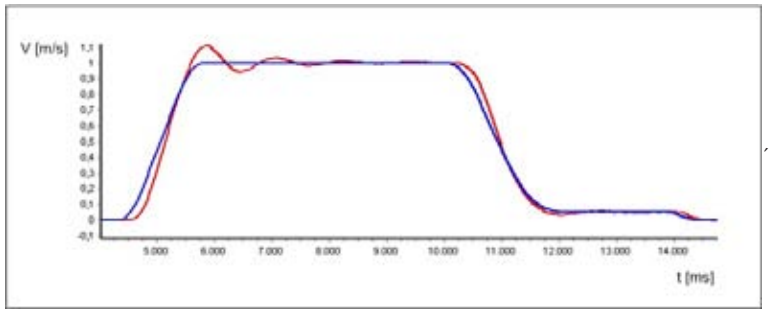
8.7 Setting the speed controller

Use the parameters "SPD_KP" (amplification) and "SPD_TI" (readjustment time) to effectively optimize the setting of the speed controller during travel. The parameters can be changed in the **"Controller/SPD_KP"** and **"Controller/SPD_TI"** menus.

```
Controller
↳SPD_KP  1.00
  ↳      0.95
SPD_REG: Base gain
```

```
Controller
↳SPD_TI  100          ms
  ↳      65
SPD_REG: reset time
```

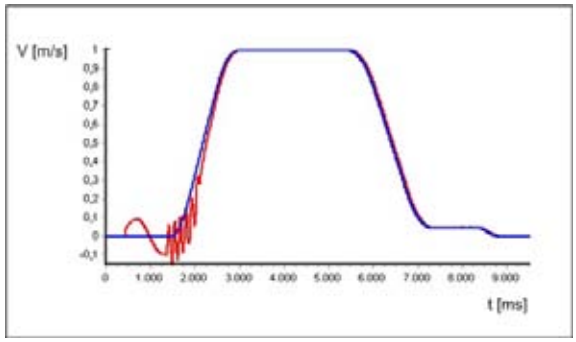
You can generally set the speed control by changing the factor for the basic amplification ("SPD_KP"). If significant control deviations occur during the trip (especially during acceleration and deceleration), (see Fig.), the amplification has been set too low. In this case, increase the factor for amplification ("SPD_KP").



Control deviations when the amplification is set too low

blue Set-value - travel speed
red Actual-value - travel speed

If the motor is noisy or starts vibrating (see figure), amplification is set too high. In this instance, the factor for amplification ("SPD_KP") should be reduced.



Control deviations when the amplification is set too high

blue Set-value - travel speed
red Actual-value - travel speed

Optimum setting of the speed controller

The following procedure is recommended to obtain an optimum setting of the speed controller: Increase the parameter **Loop control/SPD_KP**until the motor causes noises/vibrations when starting up.

Decrease the parameter **Loop control/SPD_KP**until the motor causes no noises/vibrations when starting up.

8.7.1 Turning away when starting up

Turning awaywhen starting up is indicated by uncontrolled movement of the traction sheave. The reason for this is too weak a gain of the speed controller for the time at which the brake opens.

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

```
Start
↳K_START 1.0
  ↳      3.0
Gain Start
```

CAUTION!

Caution!

Before the parameter Start/K_START is increased, it must be ensured that the basic gain (Controller/SPD_KP) is optimally set!

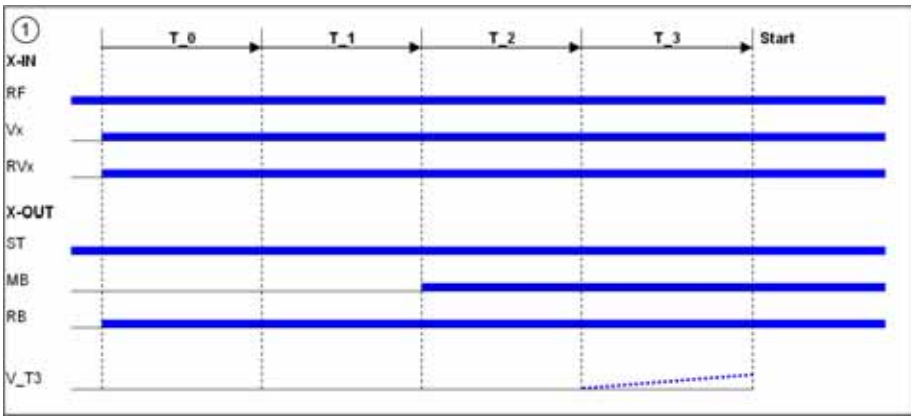
8.8 Optimizing start up behavior

Optimizing the start up behavior is only necessary if there is a negative influence on the travel comfort (e.g. through start up jerks)

Information

- Proper installation condition (rail guides, car suspension, transmission oil filling, etc.)
- The car must be empty and the counterweight completely loaded. Start-up for all loading conditions can only be optimally adjusted in under these conditions
- The speed control parameters must be correctly set in the **Controller** menu (see "Commissioning / Setting the speed control" chapter)

Start-up time sequence



T_0 Time until motor contactors have been opened
T_1 Time until magnetizing flux has been built up (only with asynchronous motors)
T_2 Time until brake has been opened
T_3 Time in which the motor is controlled to speed 0 or accelerated to V_T3
RF Controller enable
Vx Travel speed V_3
RVx Travel direction
ST Controller failure
MB_Brake Mechanical brake
RB Controller ready

The various times can be set in the "Start" menu

Time optimization through contactor monitoring

If the contact monitoring is activated (**Monitoring/CO=ON**) and the monitor contacts are connected, time T0 is optimized. As soon as the contactors are closed, time T0 is aborted and time T1 started.

Time optimization through brake monitoring

If the brake monitoring is activated (**Monitoring/BR≠ON**) and the monitoring contacts are connected, the time T2 is optimized. As soon as the brakes are opened, time T2 is aborted and time T3 started.

8.8.1 Damping the start-up jerk

Applies to all start-up variations!

To decrease the start-up jerk, acceleration can be carried out linearly at the speed V_T3 during expiration of T3. That overcomes the static friction, decreasing the start-up jerks.

8.8.2 Start-up variations

Information

The optimal start-up variations are preset based on the motor type selection in the "Motor name plate" menu.

S Synchronous motors: MOD5

A Asynchronous motors: MOD1

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

The various start-up variations can be configured in the **Start/M_Star** menu. The speed control amplification K_START is configured in the **Start/K_START** menu.

```
Start
↳M_START 1
  ↳      3
Start attenuation
```

```
Start
↳K_START 1
  ↳      3
Start gain
```

MOD1 (standard setting for asynchronous motors)

The machine is speed controlled. Up to expiration of T2, the speed is controlled at target value = 0. A shaft position change is not corrected. The parameter "K_start" is used to increase the speed control amplification. It is activated with the start of T1 and deactivated with the expiration of T2.

MOD2

Corresponds to the function of MOD1. In addition, the parameter "s_start" is activated. If the position of the machine changes during time T2 by the value entered in "s_start", "K_start" is switched off. That prevents the machine from being damaged due to too high a value of "K_start".

MOD3

The machine is both position and speed controlled. Please note that both controls are set through "K_start" and are thus dependent on each other. The position and speed control is activated with the start of T1 and deactivated with the expiration of T2.

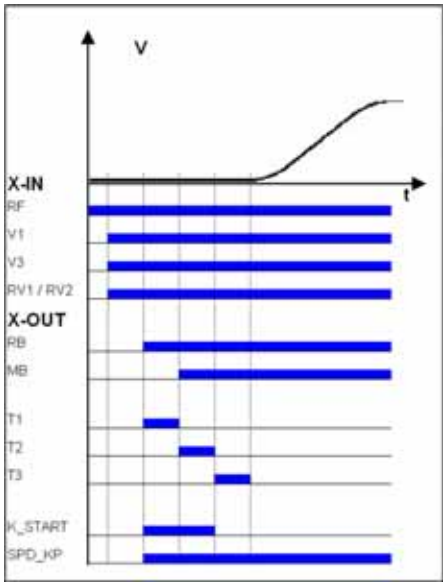
MOD5 (standard setting for synchronous motors)

The machine is position controlled. The machine position is recorded until expiration of T2 and is corrected if it changes. The parameter "K_start" is used to increase the position control amplification. It is activated with the start of T1 and deactivated with the expiration of T2

MOD4

Corresponds to the function of MOD5. In addition, the parameter "s_start" is activated. If the position of the machine changes during time T2 by the value entered in "s_start", "K_start" is switched off. That prevents the machine from being damaged due to too high a value of "K_start".

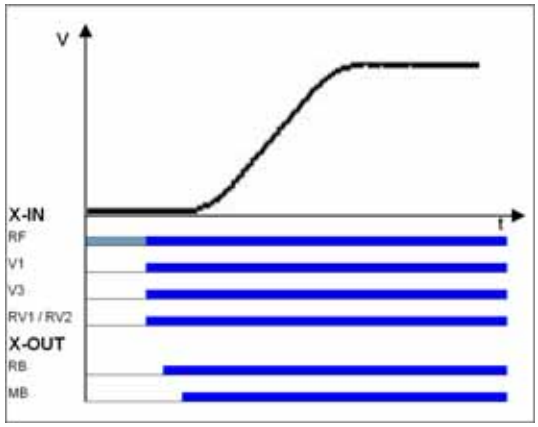
Start-up variations



RF	Controller enable
V_1	Positioning speed
V_3	Travel Speed
RV1 / RV2	Direction default
RB	Controller ready
MB_Brake	Mechanical brake
T_1	Flux build-up time
T_2	Brake opening time
T_3	Speed=0
K_START	MOD1 / MOD2 (Speed control)
	MOD3 (position- & speed control)
	MOD4 / MOD5 (position control)
SPD_KP	Base amplification speed controller

8.9 Optimizing the acceleration

The acceleration torque is defined by the parameter in the **Accelerating** menu. By changing the parameter values, you can adapt the curve shape to the requirements



Acceleration ramp

RF Controller enable
V_1 Positioning speed
V_3 Travel Speed
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake

A_POS: Acceleration preset in m/s. A higher value causes greater acceleration and thus a steeper ramp
R_POS1: Lower round off during negative acceleration, a higher value causes a softer round off
R_POS2: Lower round off during negative acceleration, a higher value causes a softer round off

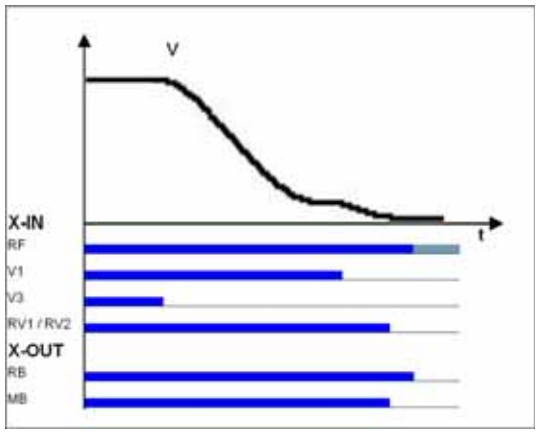
Information

To achieve optimum starting behavior:

- The motor contactors must be switched instantaneously with the digital output "RB"
- The brakes must be switched instantaneously with the digital output "MB"

8.10 Optimizing deceleration

The deceleration ramp is defined by the parameter in the **Deceleration** menu. By changing the parameter values, you can adapt the curve shape to the requirements



Deceleration ramp

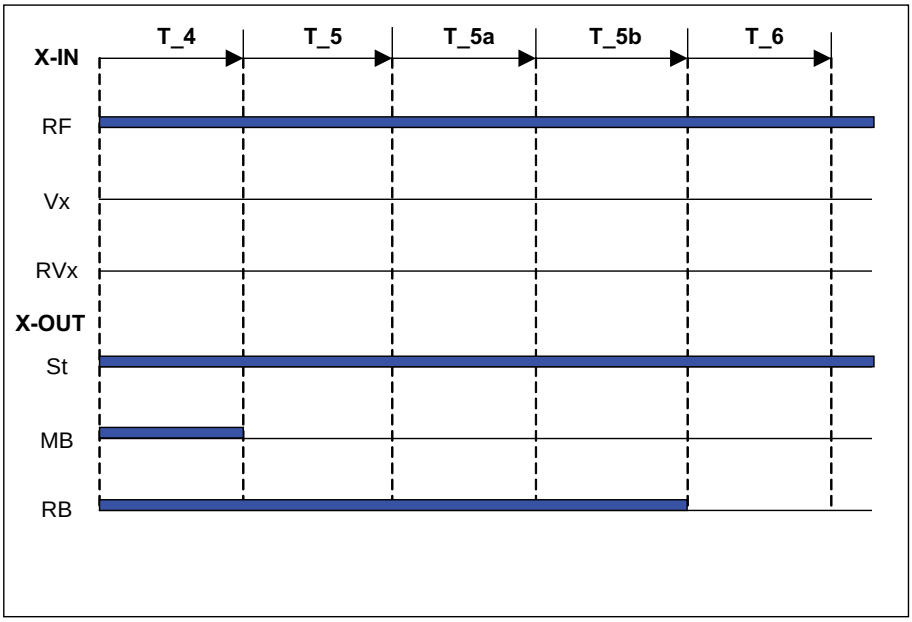
RF Controller enable
V_1 Positioning speed
V_3 Travel Speed
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake

A_NEG: Deceleration preset in m/s. A higher value causes greater deceleration and thus a steeper ramp.
R_NEG1: Preset for the upper round off. A higher value causes a softer round off.
R_NEG2: Lower round off during negative acceleration, a higher value causes a softer round off

Information
Adapting the parameter modifies the deceleration path V_3 ◦ V_1. The recalculated path is shown in the display. If necessary, correspondingly adapt the interrupt point for V_3.

8.11 Optimizing stopping

Stopping time sequence



T_4 Hold speed 0
T_5 Wait until the brake is closed
T_5a additional current feed of the brakes
T_5b Wait until the motor is currentless
T_6 Wait until the motors contactors are open
RF Controller enable
Vx Travel speed V_3
RVx Travel direction
ST Controller failure
MB_Brake Mechanical brake
RB Controller ready

The different timers can be set in the menu Stop.

Time optimization through brake monitoring
If the brake monitoring is activated (**Monitoring/BR≠Off**) and the monitor contacts are connected, time T5 is optimized. As soon as the brakes are closed, time T5 is aborted and time T5b started.

Time optimization through contactor monitoring
If the contact monitoring is activated (**Monitoring/CO=ON**) and the monitor contacts are connected, time T0 is optimized. As soon as the contactors are open, time T6 is aborted and the stopping sequence ends.

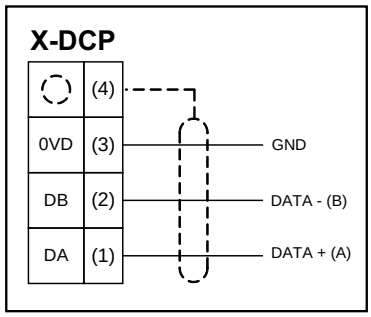
9 Serial communication

9.1 DCP (Drive Control & Position)

Information
To operate the installation with DCP protocol, the frequency inverter must be equipped with the optional board EM3-ENC-CAN-DCP (Art.-No.357107)!

The DCP-mode enables serial activation of the frequency inverter through an RS485 interface. Through the bi-directional, serial triggering, the control signals are conducted through a 2- or 3-core connection line. Generally, the lines X-IN and X-OUT are no longer required, which means the wiring expenditure is reduced to a minimum.

9.1.1 Electrical connection



DCP connection

() terminal designation of connector

Danger!
Defective connections can cause the motor to start unexpectedly or lead to uncontrolled motor movements.
Reversed connections cause the motor to rotate in the wrong direction. That can cause serious machine damage.

9.1.2 The various DCP protocols

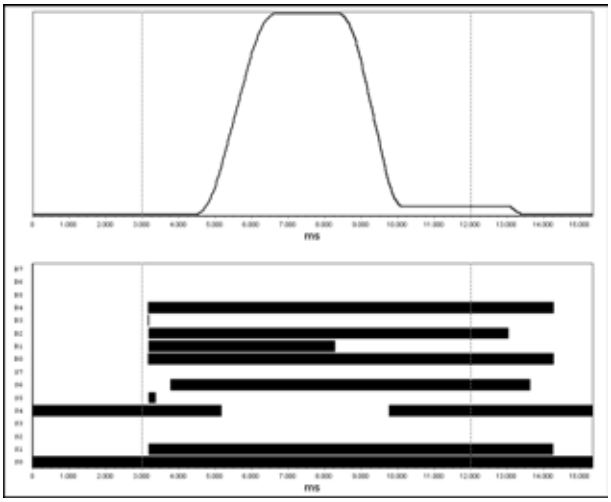
9.1.2.1 DCP_01

The operating principle is similar to a conventional triggering via the (X-IN) control inputs and (X-OUT) control outputs. The elevator control transmits the required activation signals (e.g. controller enable, direction of travel, speed, deceleration point) to the frequency inverter as command bits and receives the status messages as status bits as return information from the frequency inverter (e.g. signals for mechanical brakes and motor contactor, speed monitoring and general alarm).

9.1.2.2 DCP_03

The DCP_03 protocol is an expanded version of the DCP_01 protocol. As compared with the DCP_01 protocol, it has:

- faster data transmission
- a faster communication channel
- automatic compatibility checking between the software in the frequency inverter and software in the control system



Command byte			Speed default byte			Status byte	
B0	Controller enable RF		G0	slow speed (V1)		S0	inverter ready for the next trip
B1	travel command (start)		G1	readjustment (Vz)		S1	travel active (RB)
B2	stop switch (switching off V_1)		G2	Speed 0		S2	advance warning active
B3	Travel speed V_3		G3	return (V5)		S3	general alarm active (ST)
B4	direction of travel (RV1 or RV2)		G4	Inspection (V4)		S4	speed monitoring (interface/ V_G1)
B5	speed change		G5	Additional speed (V6)		S5	fast stop
B6	transmission of rest of route		G6	interim speed		S6	mechanical brake (MB)
B7	error in the last telegram		G7	high speed (V3)		S7	error in the last telegram

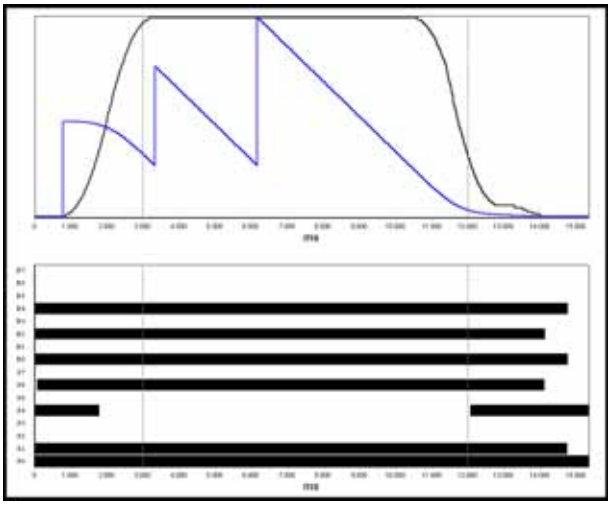
9.1.2.3 DCP_02

The transmission of the command and status bit correspond to the DCP_01-protocol. In addition, travel is residual path oriented: With the start command, the open loop control determines the path to the next floor for the frequency inverter. This path is continuously updated during the drive (residual path). The frequency inverter adapts its traveling speed to the residual path and the car arrives directly at the floor, time optimized and jolt-free without crawl drive. An absolute rotary encoder is required for setting the residual path!The brake path (shown in the inverter's display) must be manually entered into the open loop control beforehand.Through the entered brake path and the current residual path during an incoming call during the trip, the open loop control can decide whether it is still possible to stop.If no call comes in latest

9.1.2.4 DCP_04

The DCP_04 protocol is an expanded version of the DCP_02 protocol. As compared with the DCP_02 protocol, it has:

- faster data transmission
- a faster communication channel
- Automatic compatibility checking between the software in the frequency converter and software
- Braking distance transmission: The control unit continuously transmits the braking distance for the current speed to the open loop control. That means during an incoming call, the trip the open loop control can decide whether it is still possible to stop.



Command byte			Speed default byte			Status byte	
B0	Controller enable RF		G0	slow speed (V1)		S0	inverter ready for the next trip
B1	travel command (start)		G1	readjustment (Vz)		S1	travel active (RB)
B2	stop switch (switching off V_1)		G2	Speed 0		S2	advance warning active
B3	Travel speed V_3		G3	return (V5)		S3	general alarm active (ST)
B4	direction of travel (RV1 or RV2)		G4	Inspection (V4)		S4	speed monitoring (interface/ V_G1)
B5	speed change		G5	Additional speed (V6)		S5	fast stop
B6	transmission of rest of route		G6	interim speed		S6	mechanical brake (MB)
B7	error in the last telegram		G7	high speed (V3)		S7	error in the last telegram

9.1.3 Configuring in DCP mode

9.1.3.1 Activating the DCP interface

Activate the DCP interface in the **Control system/CONFIG** menu dependent on the open loop control used and the applied communication protocol.

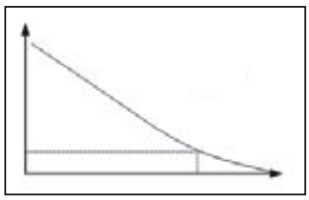
```
Control system
↳CONFIG  04:BP_DCP1
  ↳      05:BP_DCP2
Extern Control.Funct
```

Manufacturer	DCP-protocol	Mnemonic ZETADYN 3
BÖHNKE + PARTNER	DCP1	04:BP_DCP1
BÖHNKE + PARTNER	DCP2	05:BP_DCP2
BÖHNKE + PARTNER	DCP3	06:BP_DCP3
BÖHNKE + PARTNER	DCP4	07:BP_DCP4
Kollmorgen	DCP3	09:KN_DCP3
Kollmorgen	DCP4	10:KN_DCP4
NEW LIFT	DCP3	12:NL_DCP3
SCHNEIDER STEUERUNGSTECHNIK	DCP3	14:SS_DCP3
STRACK LIFT AUTOMATION	DCP3	22:ST_DCP3
STRACK LIFT AUTOMATION	DCP4	23:ST_DCP4
Weber Lifttechnik	DCP1	17:WL_DCP1
Weber Lifttechnik	DCP2	18:WL_DCP2
Weber Lifttechnik	DCP3	19:WL_DCP3
Weber Lifttechnik	DCP4	20:WL_DCP4
KW AUFZUGSTECHNIK	DCP3	26:KW_DCP3

9.1.3.2 Setting the DCP-leveling behavior

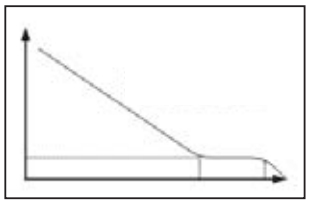
The behavior during direct leveling (only in DCP_02 and DCP_04) can be set in the **DECELERATION/S_ABH** menu.

```
Decelerating
↳S_ABH   DCP_comf
  ↳      DCP_slow
Distance dependency
```



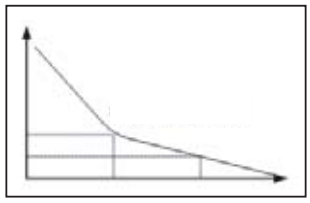
S_ABH=DCP_fast

Time optimized leveling



S_ABH=DCP_comf

Leveling with short crawl path



S_ABH=DCP_slow

Leveling with early reduction of the leveling speed

9.2 CANopen Lift

9.2.1 Start-up the CAN-interface

9.2.1.1 Information for start-up

Danger!
Defective connections can cause the motor to start unexpectedly or lead to uncontrolled motor movements.
Reversed connections cause the motor to rotate in the wrong direction. That can cause serious machine damage.

CAUTION!

Caution!
Incorrectly wired connections can destroy the electrical / electronic components.
Electrostatic discharges can be hazardous to the electronic components and lead to errors in the software.

9.2.1.2 Frequency inverter

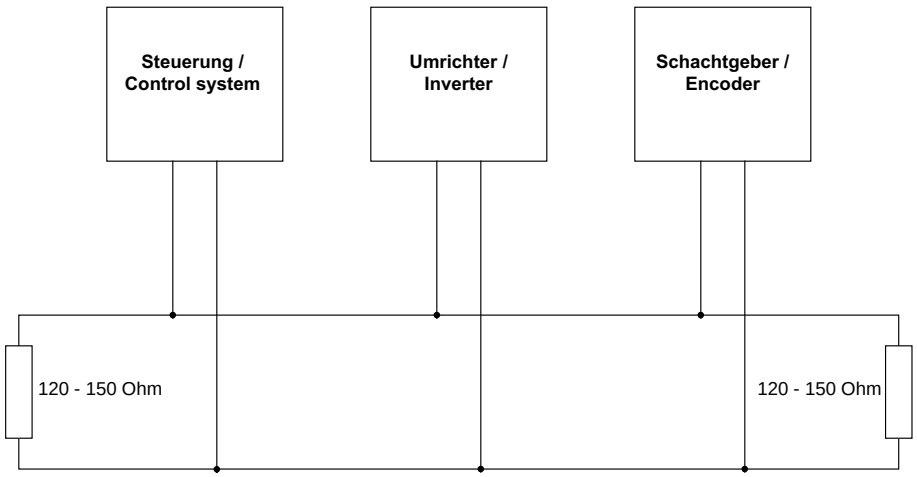
- **To operate the installation with CANopen, the frequency inverter must be equipped with the optional board EM3-ENC-CAN-DCP (Art.-No.357107)!**
- Only devices with the CiA 417 profile are allowed.
- All devices work in 11 bit - mode.
- By implication, there can be one ZETADYN 3 connected to one bus-system.
- When two ZETADYN 3 per bus-system are needed, please call Ziehl-Abegg before installing.

9.2.1.3 Bus-cable

- A shielded bus-cable is not needed, but the data wires should be twisted.
- The installation takes place in line structure. The seperate devices are connected to the bus with short branch lines.
- The bus should be terminated with a terminating resistor of 120 - 150 Ohms, at both ends of the bus.
- The maximum length of the bus is 200 m and 6 m at the branch lines.
- All devices normally work with a baud rate of 250 kBit/s.

9.2.1.4 Wiring

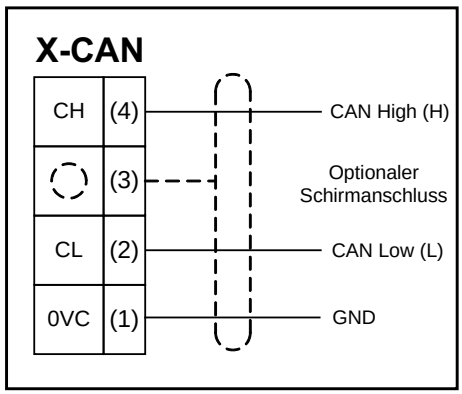
- The connection of the bus cable takes place at the slot "X-CAN" of the frequency inverter.
- Take care of the maximum bus length.
- Not correctly shielded motor- , brake chopper- or brake resistor cables can cause significant errors.
- In case of an error, check the shielding of the cables.



Exemplary assembly of a bus-system with CANopen

9.2.1.5 Electrical connection

Information
The connection of the bus cable takes place at the slot X-CAN of the frequency inverter.



Connection CAN

9.2.1.6 Activating the interface

The activation of the CAN interface can be set in the menu **Control system/CONFIG**.

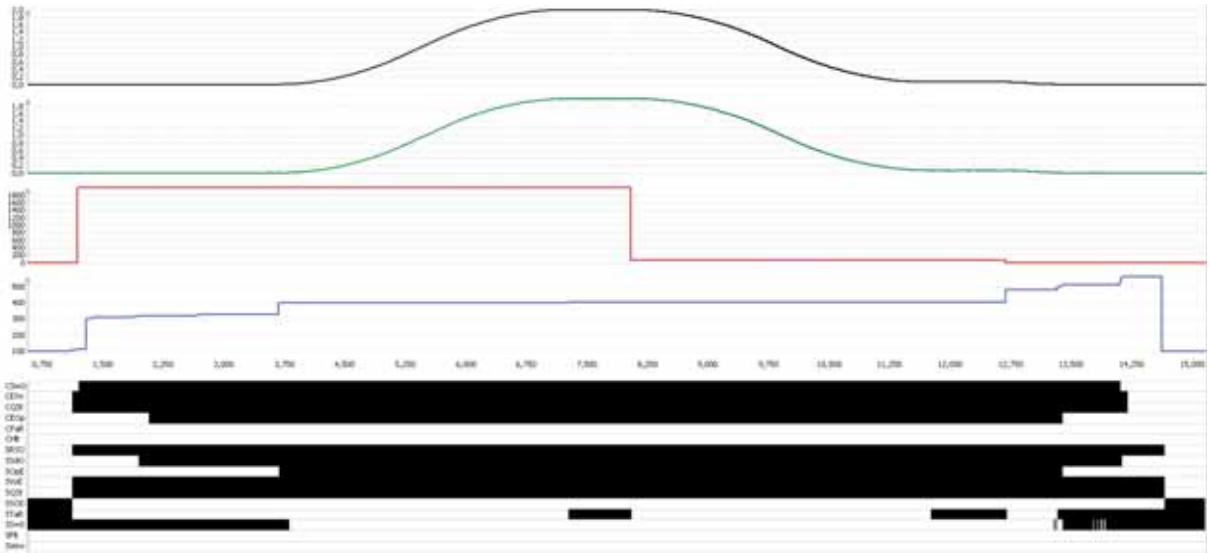
```
Control system
↳CONFIG  01:ZA_IO
  ↳      02:ZA_CAN
Configuration
```

The INFO menu shows CAN information at the pages 14 - 17 (Assumption: "CONFIG" = "02: ZA_CAN").

9.2.1.7 Operation mode

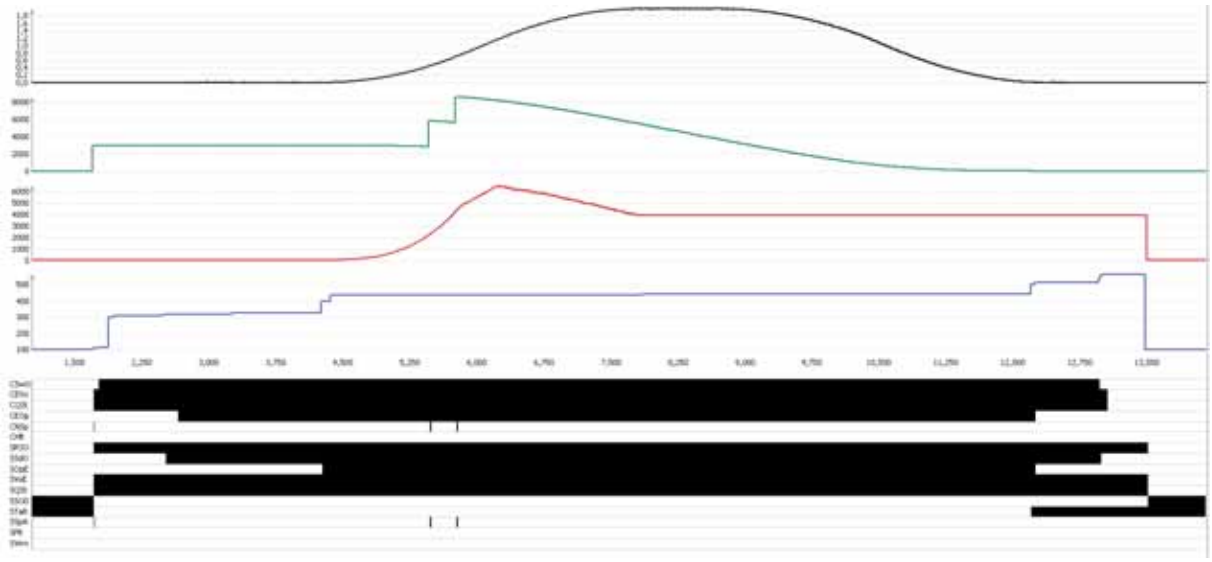
Information
There are two operation modes by using CAN:

- Velocity Mode [pv]



Velocity Mode

- Position Mode [pp]



Position Mode

The used mode can be set in the menu "CAN/MODE" of the ZETADYN 3. Generally the mode is sent from the control system to the ZETADYN 3 shortly before start-up. Therefor you have to set the operation mode in the control system.
When the ZETADYN 3 is operated in position mode, the shaft-encoder has to be connected to the same bus as the ZETADYN 3.

The control system transmits the travel speed to the frequency inverter before every drive. If the transmitted speed couldn't be reached, the frequency inverter initiates a pointed arch drive. Therefor the maximum speed has to be entered in the control system.

9.2.1.8 Command- and Statusbits of the recorder

- Position Mode [pp] C&S / Velocity Mode [pv] C&S
- C = Command = Command from the control system to the frequency inverter
- S = Status = Status of the frequency inverter as reaction of a command from the control system

Status- / Commandbit	**Description**	**Comment**
CSwO	Command Switch On	
CEVo	Command Enable Voltage	
CQSt	Command Quick Stop	
CEOp	Command Enable Operation	
CFaR	Command Fault Reset	
CNSp	Command New Setpoint	only active in position mode
CHlt	Command Halt	
SRSO	Status Ready to Switch On	
SSdO	Status Switched On	
SOpE	Status Operation Enabled	
SVoE	Status Voltage Enabled	
SQSt	Status Quick Stop	
SSOD	Status Switch On Disabled	
STaR	Status Target Reached	
SS=0	Status Speed = 0	only active in velocity mode
SSpA	Status Setpoint Acknowledge	only active in position mode
SFlt	Status Fault	
SWrn	Status Warning	

9.2.2 Parameter

9.2.2.1 Parameter settings

The seperate parameters for CAN operation can be modified in the menu **CAN**.

Parameter	Description	Value range	Factory setting
LIFT_NR	Enter the lift number	1 ... 2	1
NODE_ID	Node number, normally: Control system: 1 Frequency inverter: 2 Encoder: 4	1 ... 128	2
BD_RATE	Transfer rate (baud rate)	10 kBd ... 250 kBd	250 kBd
MODE	Operation mode of the ZETADYN 3	Position / Velocity	Position
T_CMD	Maximum waiting time for commands of the control system	200 ... 3000 ms	1500 ms
T_MAX	Maximum processing time for the CAN messages per cycle.	0,1 ... 3 ms	0.8 ms

The info menu with the CAN-specific displays is in chapter 10 "Parameter List" on pages 14 to 17.

Information
The in the ZETADYN 3 adjusted nominal travel speed V* has to be equal or higher than the speed which is sent to the ZETADYN 3 by the control system. Otherwise no drive takes place.

9.2.2.2 Network Management Status

Status:	BootUp:	ZETADYN 3 is switching to the bus
	Stop:	ZETADYN 3 was stopped (normally by the control system)
	Preop.:	ZETADYN 3 can be parametrised, but before the it has to be set to "operational".
	Opera.:	ZETADYN 3 is ready, a drive can take place.
Controller State:	No Error:	No errors existent
	Warn.Lim.:	Error counter exceed 127
	Bus off:	Because of too many errors the device was switched off the bus (Error counter > 255)

10 Parameter list

Information
Not all of the described paramters are freely accessible. The indication of the parameters depends on the choosen functions and the adjustments of the frequency inverter.

The individual parameters are subdivided into various menus based on their functions.

10.1 Startup menu

All the parameters required for initial start-up are contained in the Startup menu.
The Startup menu is only displayed in the "Basic" level.

Parameter	Description	Value range	Factory setting
LCD	Select the desired operating language. The operating languages German and English are integrated into the device as standard. A third operating language can be loaded with the memory card. The following folders must be saved on the memory card for this: 3BF\Update\Language	Deutsch English Nederland Espanol Türkce Italiano Svenska Czech France	Deutsch
USR_LEV	User Level Choice about the user level which is active on the ZETAPAD after starting the ZETADYN 3.	Basic Advanced	Basic
MOT_TYP	Enter the operated motor type A **ASM:**Asynchronous motor S **SMxxx:** Synchronous motor External product **SM160:** Ziehl-Abegg synchronous motor type SM160 **SM200:** Ziehl-Abegg synchronous motor type SM200 **SM225:** Ziehl-Abegg synchronous motor type SM225 **SM250:** Ziehl-Abegg synchronous motor type SM250 **SM700:** Ziehl-Abegg synchronous motor type SM700 **SM860:** Ziehl-Abegg synchronous motor type SM860	ASM SMxxx SM160 SM200 SM225 SM250 SM700 SM860	
n	Enter the motor's rated speed	10 ... 2990 rpm	0
f	Enter the motor's rated frequency	3.0 ... 125.0 Hz	0.1
I	Enter the motor's rated current	5.0 ... 140.0 A	0.0
U	Enter the motor's rated voltage Enter the motor's rated current	200 ... 460 V	0
p	Enter the motor's rated power	1.0 ... 65.0 kW	0
cos phi	A Enter the motor's power factor (only for asynchronous motors)	0.10 ... 1.0	0.88
TYP	Enter the motor's type of connection	Star Delta	Star

Parameter	Description	Value range	Factory setting
ENC_TYP	Enter the type of encoder used S **EnDat/SSI:** Absolute rotary encoder Position information is transmitted either via SSI (synchronous serial interface) or EnDat protocol **ERN1387:** absolute encoder Position information is transmitted by analog signal **Hiperface:** **Codeface:** A **TTL Sine:** 5V encoder with sinusoidal signal **TTL Square:** 5V encoder with square-wave signal **HTL 10-30V:** 10-30V encoder with square-wave signal **No ENC.:** Open-loop-mode	EnDat/SSI HTL 10-30V TTL square TTL Sine Hiperface Codeface ERN1387 No ENC.	EnDat/SSI
ENC_INC	Enter encoder resolution (pulses/revolution)	64 ... 10000	2048
BC_TYP	Enter the used brake resistor or brake chopper **BR11:** Brake resistor type BR11-A **BR50:**Brake resistor type BR50 **BR50+BR25:** parallel connection of BR25 and BR50 **BR50+BR50:** parallel connection of 2 pieces BR50 **BRxx:** Brake resistor external product **PFU:** Power Feedback Unit **PFU+BR11:** Power Feedback Unit + Brake resitor type BR11 **PFU+BR11:** Power Feedback Unit + Brake resitor type BR17 **PFU+BR11:** Power Feedback Unit + Brake resitor type BR25 **PFU+BR11:** Power Feedback Unit + Brake resitor type BR50 **BR09-1:** Brake-Resistor Type BR09-1 **BR14:** Brake resistor type BR14 **BR100:** Brake resistor type BR100 **PFU+BRxx:** Power Feedback Unit + Brake resitor external product **2*BR100:** parallel connection of 2 pieces BR100 **BR17-1:** Brake resistor type BR17 **BR25-1:** Brake resistor type BR25 **BC25:** Brake-Chopper type BC25 **BC50:** Brake-Chopper type BC50 **BC100:** Brake-Chopper type BC100	BR11 BR50 BR50+BR25 BR50+BR50 BRxx PFU PFU+BR11 PFU+BR17 PFU+BR25 PFU+BR50 BR09-1 BR14 BR100 PFU+BRxx 2* BR100 BR17 BR25 BC25 BC50 BC100	BR17
V*	Enter the installation rated speed	0.00 ... 3.0 m/s	1.00
__D	Enter the diameter of the traction sheave	0.10 ... 1.20 m	0.50
__iS	Enter the installation's type of suspension	1:1 2:1 3:1 4:1 5:1 6:1 7:1 8:1	1:1
__i1	Input of **i1** of the gearbox ratio **i1:i2**	1 ... 650	38.00
__i2	Input of **i2** of the gearbox ratio **i1:i2**	1 ... 1000	1
Q	Enter the elevator installation's rated load	100 ... 20000	600
F	Enter the car weight	100 ... 20000	1000
G	Enter the counterweight	0 ... 20000	1300

Parameter	Description	Value range	Factory setting
CONFIG	Configuration of the digital inputs according to the used control system and type of communication **Free:** Outputs are freely configurable **01:ZA_IO:** Ziehl-Abegg standard control **02:ZA_CAN:** Ziehl-Abegg CAN **03:BP_IO:** Böhnke+Partner standard control **04:BP_DCP1:** Böhnke & Partner DCP1 **05:BP_DCP2:** Böhnke & Partner DCP2 **06:BP_DCP3:** Böhnke & Partner DCP3 **07:BP_DCP4:** Böhnke & Partner DCP4 **08:KN_IO:** Kollmorgen standard control **09:KN_DCP3:**Kollmorgen DCP3 **10:KN_DCP4:** Kollmorgen DCP4 **11:NL_IO:** New Lift standard control **12:NL_DCP3:** New Lift DCP3 **13:SS_IO:** Schneider Steuerungen standard control **14:SS_DCP3:** Schneider Steuerungen DCP3 **15:ZA_BIN:** Ziehl-Abegg standard control with binary speed presetting **16:WL_IO:** Weber Lifttechnik standard control **17:WL_DCP1**: Weber Lifttechnik DCP1 **18:WL_DCP2** Weber Lifttechnik DCP2 **19:WL_DCP3** Weber Lifttechnik DCP3 **20:WL_DCP4** Weber Lifttechnik DCP4 **21:ST_IO** Strack Lift Automation standard control **22:ST_DCP3** Strack Lift Automation DCP3 **22:ST_DCP3** Strack Lift Automation DCP4 **24:CSILVA:** Carlos Silva standard control **25:S+S:** Schmitt+Sohn standard control **26:KW_DCP3:** KW Aufzugstechnik DCP3 **27: MAS_BIN:** Masora standard control **28: BU_SATU:** Hydraulic elevator aggregate with Bucher-Aggregat type Saturn ALPHA **29: BU_ORIO:** Hydraulic elevator aggregate with Bucher-Aggregat type Orion ALPHA **30: KS_IO:** Georg Kühn Control systems standard control	00:Free 01:ZA_IO 02:ZA_CAN 03:BP_IO 04:BP_DCP1 05:BP_DCP2 06:BP_DCP3 07:BP_DCP4 08:KN_IO 09:KN_DCP3 10:KN_DCP4 11:NL_IO 12:NL_DCP3 13:SS_IO 14:SS_DCP3 15:ZA_BIN 16:WL_IO 17:WL_DCP1 18:WL_DCP2 19:WL_DCP3 20:WL_DCP4 21:ST_IO 22:ST_DCP3 23:ST_DCP4 24:CSILVA 25:S+S 26:KW_DCP3 27:MAS_BIN 28:Bucher_SATU 29:Bucher_ORIO 30:KS_IO	01:ZA_IO
MO_DR	Changing the rotating direction of the motor It must be observed the with triggering the input RV1 the cabin drives upwards **left:** Rotary direction left **right:** Rotary direction right	left right	left
CO	Monitoring the travel contactors **Off:** Contactor monitoring deactivated **CO1:** Contactor monitoring is only implemented by input CO1 (series connection of the monitoring contacts) **CO1&CO2:** Contactor monitoring is implemented by inputsCO1 and CO2 (individual monitoring of the monitoring contacts)	OFF CO1 CO1&CO2	CO1

Parameter	Description	Value range	Factory setting
BR	Motor brake monitoring Input of number and function of the brake monitoring contacts used **OFF:**no brake monitoring connected **1*NC:** 1x normally closed contact (Contact closed when brake currentless) **2*NC:** 2 x normally closed contact (Contact closed when brake currentless) **3*NC:** 3 x normally closed contact (Contact closed when brake currentless) **1*NO:** 1 x normally open (contact is open when brake currentless) **2*NO:** 2 x normally open contact (contact is open when brake currentless) **3*NO:** 3 x normally open (contact is open when brake currentless)	Off 1*NC 2*NC 3*NC 1*NO 2*NO 3*NO	accordingly to motor type
P1P2	Motor temperature monitoring **Off:** Temperature monitor deactivated **PTC:** thermistor (PTC according to DIN 44082) **TC:** Thermal circuit breaker **KTY:** Temperature sensor KTY84-130	Off PTC TC KTY	PTC
K_START	Start gain Multiplicative factor for the parameter "Controller/SPD_KP" Increasing the PI controller during the start-up	is automatically limited	1.0
SPD_KP	Multiplication factor to modify the calculated basic amplification SPD_C	is automatically limited	1.0

10.2 LCD & Password menu

Selection the desired operating language. Protects the frequency inverter from access by third parties by assigning a password.Modifying the parameters is only possible after entering the password. A password is not factory set.

Parameter	Description	Value range	Factory setting
LCD	Select the desired operating language. The operating languages German and English are integrated into the device as standard. A third operating language can be loaded with the memory card. The following folders must be saved on the memory card for this: 3BF\Update\Language	Deutsch English Nederland Espanol Türkce Italiano Svenska Czech France	Deutsch
USR_LEV	User Level Choice about the user level which is active on the ZETAPAD after starting the ZETADYN 3.	Basic Advanced	Basic
PASSWD	Enter password.	0 ... 9999 0 = no password	0
PW_NEW	New password A number between 0 and 9999 can be used as a password	0 ... 9999	0
PWCOD	Displays the password in coded form. If you lose the password, please contact the manufacturer.	Cannot be set	21689
PW_CLR	Deleting the password The password has to be entered correctly before **ON:** Delete password **Off:** no function	On Off	Off

10.3 Motor name plate menu

Enter the motor data in accordance with the data on the motor name plate.

Information
The motor data must be configured before the first trip!

The procedure for entering the motor data is described in the "Commissioning" chapter.

Parameter	Description	Value range	Factory setting
MOT_TYP	Enter the operated motor type A **ASM:**Asynchronous motor S **SMxxx:** Synchronous motor External product **SM160:** Ziehl-Abegg synchronous motor type SM160 **SM200:** Ziehl-Abegg synchronous motor type SM200 **SM225:** Ziehl-Abegg synchronous motor type SM225 **SM250:** Ziehl-Abegg synchronous motor type SM250 **SM700:** Ziehl-Abegg synchronous motor type SM700 **SM860:** Ziehl-Abegg synchronous motor type SM860	ASM SMxxx SM160 SM200 SM225 SM250 SM700 SM860	
n	Enter the motor's rated speed	10 ... 2990 rpm	0
f	Enter the motor's rated frequency	3.0 ... 125.0 Hz	0.1
p	Displays the number of pole pairs of the motor	nicht einstellbar	
I	Enter the motor's rated current	5.0 ... 140.0 A	0.0
U	Enter the motor's rated voltage Enter the motor's rated current	200 ... 460 V	0
P	Enter the motor's rated power	1.0 ... 65.0 kW	0
cos phi	A Enter the motor's power factor (only for asynchronous motors)	0.10 ... 1.0	0.88
TYP	Enter the motor's type of connection	Star Delta	Star
M_MAX	Maximum motor torque	0.2 ... 5.0	2.0

10.4 Encoder & BC menu

Enter:

- Encoder type
- Encoder resolution
- used Brake-Chopper or Brake resistor type

Parameter	Description	Value range	Factory setting
ENC_TYP	Enter the type of encoder used S **EnDat/SSI:** Absolute rotary encoder Position information is transmitted either via SSI (synchronous serial interface) or EnDat protocol **ERN1387:** absolute encoder Position information is transmitted by analog signal **Hiperface:** **Codeface:** A **TTL Sine:** 5V encoder with sinusoidal signal **TTL Square:** 5V encoder with square-wave signal **HTL 10-30V:** 10-30V encoder with square-wave signal **No ENC.:** Open-loop-mode	EnDat/SSI HTL 10-30V TTL square TTL Sine Hiperface Codeface ERN1387 No ENC.	EnDat/SSI
ENC_INC	Enter encoder resolution (pulses/revolution)	64 ... 10000	2048

BC_TYP	Enter the used brake resistor or brake chopper **BR11:** Brake resistor type BR11-A **BR50:**Brake resistor type BR50 **BR50+BR25:** parallel connection of BR25 and BR50 **BR50+BR50:** parallel connection of 2 pieces BR50 **BRxx:** Brake resistor external product **PFU:** Power Feedback Unit **PFU+BR11:** Power Feedback Unit + Brake resitor type BR11 **PFU+BR11:** Power Feedback Unit + Brake resitor type BR17 **PFU+BR11:** Power Feedback Unit + Brake resitor type BR25 **PFU+BR11:** Power Feedback Unit + Brake resitor type BR50 **BR09-1:** Brake-Resistor Type BR09-1 **BR14:** Brake resistor type BR14 **BR100:** Brake resistor type BR100 **PFU+BRxx:** Power Feedback Unit + Brake resitor external product **2*BR100:** parallel connection of 2 pieces BR100 **BR17-1:** Brake resistor type BR17 **BR25-1:** Brake resistor type BR25 **BC25:** Brake-Chopper type BC25 **BC50:** Brake-Chopper type BC50 **BC100:** Brake-Chopper type BC100	BR11 BR50 BR50+BR25 BR50+BR50 BRxx PFU PFU+BR11 PFU+BR17 PFU+BR25 PFU+BR50 BR09-1 BR14 BR100 PFU+BRxx 2* BR100 BR17 BR25 BC25 BC50 BC100	BR17
R_BR	Enter resistance of brake resistor when third-party product used ("BC_TYP=BRxx")	4 ... 200 Ohm	64
P_BR	Enter rating performance when third-party product used ("BC_TYP=BRxx")	0.0 ... 65 kW	0.5
T_PFU	Input of time between end of run and activation of the output with the PFU function **Input 0:** Function deactivated	0 ... 600 s	0

10.5 Installation menu

Enter of installation specific data

Information
The installation data must be configured before the first trip!

The procedure for calculating the installation nominal speed and to preset the travel data is described in the "Commissioning" chapter.

Parameter	Description	Value range	Factory setting
V*	Enter the installation rated speed	0.00 ... 3.0 m/s	1.00
MOD_n*	Input type of the motor speed at installation rated speed **direct:** manually input of V* and n* **Calculate:** Calculates the speed of the motor dependent on: V*; __D; __iS;__; __i1 and __i2	direct Calculate	Calculate
n*	Motor speed at V* **MOD_n = direct:** direct input of the motor speed at V* **MOD_n = calculate:** Calculates the speed of the motor dependent on: V*; __D; __iS;__; __i1 and __i2	10 ... 2990 rpm	0
__D	Enter the diameter of the traction sheave	0.10 ... 1.20 m	0.500

Parameter	Description	Value range	Factory setting
__iS	Enter the installation's type of suspension	1:1 2:1 3:1 4:1 5:1 6:1 7:1 8:1	1:1
__i1	Input of i1 of the gearbox ratio i1:i2	1 ... 650	38.00
__i2	Input of i2 of the gearbox ratio i1:i2	1 ... 1000	1
Q	Enter the elevator installation's rated load	100 ... 20000 kg	600
F	Enter the car weight	100 ... 20000 kg	1000
G	Enter the counterweight	0 ... 20000 kg	1300

10.6 Control system menu

Configuring of:

- elevator control system
- Digital inputs
- Digital outputs
- ZETAPAD

Parameter	Description	Value range	Factory setting
CONFIG	Configuration of the digital inputs according to the used control system and type of communication **Free:** Outputs are freely configurable **01:ZA_IO:** Ziehl-Abegg standard control **02:ZA_CAN:** Ziehl-Abegg CAN **03:BP_IO:** Böhnke+Partner standard control **04:BP_DCP1:** Böhnke & Partner DCP1 **05:BP_DCP2:** Böhnke & Partner DCP2 **06:BP_DCP3:** Böhnke & Partner DCP3 **07:BP_DCP4:** Böhnke & Partner DCP4 **08:KN_IO:** Kollmorgen standard control **09:KN_DCP3:**Kollmorgen DCP3 **10:KN_DCP4:** Kollmorgen DCP4 **11:NL_IO:** New Lift standard control **12:NL_DCP3:** New Lift DCP3 **13:SS_IO:** Schneider Steuerungen standard control **14:SS_DCP3:** Schneider Steuerungen DCP3 **15:ZA_BIN:** Ziehl-Abegg standard control with binary speed presetting **16:WL_IO:** Weber Lifttechnik standard control **17:WL_DCP1**: Weber Lifttechnik DCP1 **18:WL_DCP2** Weber Lifttechnik DCP2 **19:WL_DCP3** Weber Lifttechnik DCP3 **20:WL_DCP4** Weber Lifttechnik DCP4 **21:ST_IO** Strack Lift Automation standard control **22:ST_DCP3** Strack Lift Automation DCP3 **22:ST_DCP3** Strack Lift Automation DCP4 **24:CSILVA:** Carlos Silva standard control **25:S+S:** Schmitt+Sohn standard control **26:KW_DCP3:** KW Aufzugstechnik DCP3 **27: MAS_BIN:** Masora standard control **28: BU_SATU:** Hydraulic elevator aggregate with Bucher-Aggregat type Saturn ALPHA **29: BU_ORIO:** Hydraulic elevator aggregate with Bucher-Aggregat type Orion ALPHA **30: KS_IO:** Georg Kühn Control systems standard control	00:Free 01:ZA_IO 02:ZA_CAN 03:BP_IO 04:BP_DCP1 05:BP_DCP2 06:BP_DCP3 07:BP_DCP4 08:KN_IO 09:KN_DCP3 10:KN_DCP4 11:NL_IO 12:NL_DCP3 13:SS_IO 14:SS_DCP3 15:ZA_BIN 16:WL_IO 17:WL_DCP1 18:WL_DCP2 19:WL_DCP3 20:WL_DCP4 21:ST_IO 22:ST_DCP3 23:ST_DCP4 24:CSILVA 25:S+S 26:KW_DCP3 27:MAS_BIN 28:Bucher_SATU 29:Bucher_ORIO 30:KS_IO	01:ZA_IO
MO_DR	Changing the rotating direction of the motor It must be observed the with triggering the input RV1 the cabin drives upwards **left:** Rotary direction left **right:** Rotary direction right	left right	left
CTRL	Select the communication between the inverter and the control system under "CONFIG=Free" **Standard:** Parallel connection **DCP1:** Communication by DCP01 protocol **DCP2:** Communication by DCP02 protocol **DCP3:** Communication by DCP03 protocol **DCP4:** Communication by DCP04 protocol	Standard DCP01 DCP02 DCP03 DCP04	Standard

Parameter	Description	Value range	Factory setting
f_I01	Configuration of the function of the digital inputs I01 … I08 under "CONFIG=free" (For description of the functions, see table). Input I08 is free adjustable, independent of "CONFIG".	00:Free 01:RF 02:RV1-UP 03:RV2-DOWN 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:SBIN0 25:SBIN1 26:SBIN2 27:MBIN0 28:MBIN1 29:MBIN2 30: STANDBY 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	01:RF
f_I02			04:V1
f_I03			05:V2
f_I04			06:V3
f_I05			07:VZ
f_I06			02:RV1-UP
f_I07			03:RV2-DOWN
f_I08			00:Free
f_XBR1	Configuration of the function of the digital inputs for the brake monitoring BR1 ... BR4 (For description of the functions, see table)		00:Free
f_XBR2			00:Free
f_XBR3			00:Free
f_XBR4			00:Free
f_O1	Configuration of the function of the digital outputs O1 … O4 under "CONFIG=free" (For description of the functions, see table)	Off MotContact RB-Invers V<V_G1 V<V_G2 V<1.1*V_3 Warning Fault EVAC.Dir MB_Brake INV V<V_G1 INV V<V_G2 V=0 PFU Info rope TD_CNT ext.	Fault
f_O2			MB_Brake
f_O3			MotContact
f_O4			V < V_G1
f_PWM	Configuration of the function of the digital output PWM **WARNING!** The PWM output does not have zero potential. The GND potential of the internal 24 V mains supply is connected!		

Parameter	Description	Value range	Factory setting
V_G1	Presetting of the limit value 1 when using the V<V_G1 parameter for a digital output	0.03 ... 3.20 m/s	0.30
V_G2	Presetting of the limit value 2 when using the V<V_G2 parameter for a digital output	0.03 ... 3.20 m/s	0.80
V_G3	Presetting of the limit value 3 (this information is only issued when using a DCP protocol)	0.03 ... 3.20 m/s	0.50
SIM_V1	**ON:** Distance-dependent delay of V3 -> V1 or V2 -> V1 is carried out if V1 is activated 100 ms after switching off V3 or V2 at the latest SIM_V1 must be activated to carry out a distance-dependent delay of V3 -> V1 or V2 -> V1 with binary speed specification **Off:** Distance-dependent delay of V3 -> V1 or V2 -> V1 is only carried out if the positioning speed is already activated at the time of deactivation of a high travelling speed (V3 or V2)	On Off	Off
A_MAX	Delay in elevator emergency stop due to deactivation of the input with the function "/DELAY"		1.00 m/s^2
S_B_OFF	Additional braking offset If the control system doesn't extend early enough, it can be increased here	50 ... 160 mm	50

Parameter descriptions for digital inputs

Parameter	Function	Explanation
00:Free	Function not assigned	Activating the input is noneffective
01:RF	Controller enable	Enable for the frequency inverter. This input must be triggered during the entire trip.
02:RV1	Direction preset UP	Travel direction "UP" of car
03:RV2	Direction prest DOWN	Travel direction "DOWN" of car
04:V1	Positioning speed	Speed to position the car to the stop point
05:V2	Intermediate speed	If necessary, the intermadiate speed for normal travel
06:V3	Travel speed V_3	High travel speed for normal travel
07:VZ	Readjustment speed	Speed for readjustment. Has precedence above all other speeds!
08:V4	Additional speed 1	Additional speed for inspection and return operation
09:V5	Additional speed 2	Additional speed for inspection and return operation
10:V6	Additional speed 3	Additional speed for inspection and return operation
11:V7	Additional speed 4	Additional speed for inspection and return operation
12:PARA2	Switchover to 2nd parameter set	2nd parameter set is activated
13:BIN0	Binary input 0	Speed default through binary coding Standard-configuration
14:BIN1	Binary input 1	Speed default through binary coding Standard-configuration
15:BIN2	Binary input 2	Speed default through binary coding Standard-configuration
16:DIR	Direction default	Default for direction of travel when using one input 1 signal: Direction of travel UP 0 signal: Direction of travel DOWN
17:v=0	Hold speed 0	When the motor brake is open, speed 0 is controlled
18:RF+RV1	Controller enable + travel direction UP	Controller enable and travel direction UP are triggered with one input
19:RF+RV2	Controller enable + travel direction DOWN	Controller enable and travel direction DOWN are triggered with one input
20:BR1	Brake monitoring 1	Brake monitoring with unsing the input terminal X-IN
21:BR2	Brake monitoring 2	Brake monitoring with unsing the input terminal X-IN
22:BR3	Brake monitoring 3	Brake monitoring with unsing the input terminal X-IN

Parameter	Function	Explanation
23:BR4	Brake monitoring 4	Brake monitoring with unsing the input terminal X-IN
24:SBIN0	Binary input 0 Configuration Schmitt+Sohn	Speed default through binary coding Configuration Schmitt+Sohn
25:SBIN1	Binary input 1 Configuration Schmitt+Sohn	Speed default through binary coding Configuration Schmitt+Sohn
26:SBIN2	Binary input 2 Configuration Schmitt+Sohn	Speed default through binary coding Configuration Schmitt+Sohn
27:MBIN0	Binary input 0 Configuration Masora	Speed default through binary coding Configuration Masora
28:MBIN0	Binary input 1 Configuration Masora	Speed default through binary coding Configuration Masora
29:MBIN0	Binary input 2 Configuration Masora	Speed default through binary coding Configuration Masora
30:STANDBY	Standby	Switching the frequency converter to standby function to save energy
31:STEP+	Touch mode for special applications	Positive change
32:STEP-	Touch mode for special applications	Negative change
33:PFU_BR	Power Feedback Unit + brake resistor	Function monitoring of the feedback unit when using a brake resistor in connection with a feedback unit
34:HY_UP	Direction UP at hydraulic elevator with Bucher aggregate type Saturn ALPHA	The input functions RF+RV1+V1 are activated simultaneously when the input is activated only in ZETADYN 3xx-HY
35:HY_DOWN	Direction DOWN at hydraulic elevator with Bucher aggregate type Saturn ALPHA and Orion ALPHA	The input functions RF+RV2+V1 are activated simultaneously when the input is activated only at ZETADYN 3-HY
36:/DELAY	Delay in emergency stop	When deactivating the input the motor is braked with the delay set in the **Controller/A_MAX** menu
37:DTE	Ziehl-Abegg test function	Reserved for Ziehl-Abegg
38:RECORD	Recorder function	Start or stop measurement by external signal **Input activated:** Measurement is active **Input deactivated:** Measurement is stopped and saved
39:INV_A1	Direction UP at hydraulic elevator with Bucher aggregate type Orion ALPHA	Inverting the analog target value A1
40:FKT.ana	Ziehl-Abegg test function	Reserved for Ziehl-Abegg
41:Monitor	Monitoring function for manually evacuation	Shown evacuation direction and evacution speed

Parameter descriptions for digital outputs

Parameter	Function	Explanation
Off	Output has no function	Output is open all the time
MotContact	Controller ready Switching the motor contactors	Contact closes when the following signals are applied: Controller enable, traveling speed and direction default. When the contact closes, the motor contactors must be switched immediately.
RB_Invers	Inverted function of "RB contactor"	Contact opens when the following signals are applied: Controller enable, traveling speed and direction default.
V<V_G1	Speed monitoring	Contact opens when the tolerance set in the "Control system" menu V_G1 is exceeded.
V<V_G2	Speed monitoring	Contact opens when the tolerance set in the "INTERFACE" menu V_G1 is exceeded.
V<1.1*V_3	Speed monitoring	Contact opens when the traveling speed V3 is exceeded by 10%.

Parameter	Function	Explanation
Warning	Warning	Monitoring of the motor temperature and the temperature of the power section. Contact opens if a malfunction advance warning is present because of an excess temperatur. The current trip will be traveled to the end. The advance warning can be evaluated by the open loop control and a new start can be prevented.
Fault	Fault	Contact is closed if no error is present in the frequency inverter.
EVAC.DIR	Evacuation direction	Contact open: Car is lighter than counterweight Contact closed: car is heavier than counterweight
MB_Brake	Mechanical brake	Contact closes after expiration of the magnetic flux creation time. When the contact close, the mechanical brake must be immediately opened via an external contactor.
INV V<V_G1	inverted function of "V<V_G1"	Contact closes when the limit value set in the "Control system" menu V_G1 is exceeded.
INV V<V_G2	inverted function of "V<V_G2	Contact closes when the limit value set in the "Control system" menu V_G2 is exceeded.
V=0	Speed = 0	Contact opens at start of travel when actual speed > 0 m/s Contact closes at the end of travel when actual speed = 0 m/s and output for control mode contactor = 0
PFU	Power regeneration unit	Switching the feedback unit to standby function to save energy
Info rope	Rope-change necessary	Contact closes when the actual rope still can be used, for approx 1 year. Contact stays close until the down-counter will be reset.
TD_CNT ext.	Monostable trigger circuit	The output relay gives an impulse to the output at every travel direction change. For connecting an external counter, e.g. in the control system

10.7 Monitoring menu

Configuring the monitoring functions

Parameter	Description	Value range	Factory setting
MOD_ST	Behavior of the frequency inverter during fault **Lock function:** If serious errors occur successively without a flawless trip being carried out, it is possible to blocks the inverter. The output "ST malfunction" remains open. If a flawless trip is carried out, the error counter is reset to 0. **Fix 2 Sec:** no blocking function, the output configured on "ST" drops for 2 seconds during a malfunction and then increases again **Lock n.3:** Block function after 3 malfunctions. Output "ST" remains dropped after the 3rd error **Lock n.2:** Locking function after 2 faults. Output "ST" remains released after the second fault. **Lock n.1:** Block function after 1 malfunction. Output "ST" remains dropped after the 1st error. The following notification text appears during a block function: "ZETADYN block [OFF]".After pressing the "i" key, the device returns back to normal operation. The errors that led to the block are accordingly marked in the error list.	Fix 2s Lock n.3 Lock n.2: Lock n.1	Fix 2s
LOCKBR	Block at brake malfunction The controller is locked in case of brake malfunctions if this parameter is switched on. At **CONFIG: 31:KL_IO** LOCKBR is activated automatically	ON OFF	OFF
CO	Monitoring the travel contactors **Off:** Contactor monitoring deactivated **CO1:** Contactor monitoring is only implemented by input CO1 (series connection of the monitoring contacts) **CO1&CO2:** Contactor monitoring is implemented by inputsCO1 and CO2 (individual monitoring of the monitoring contacts)	OFF CO1 CO1&CO2	CO1

Parameter	Description	Value range	Factory setting
BR	Motor brake monitoring Input of number and function of the brake monitoring contacts used **OFF:**no brake monitoring connected **1*NC:** 1x normally closed contact (Contact closed when brake currentless) **2*NC:** 2 x normally closed contact (Contact closed when brake currentless) **3*NC:** 3 x normally closed contact (Contact closed when brake currentless) **1*NO:** 1 x normally open (contact is open when brake currentless) **2*NO:** 2 x normally open contact (contact is open when brake currentless) **3*NO:** 3 x normally open (contact is open when brake currentless)	Off 1*NC 2*NC 3*NC 1*NO 2*NO 3*NO	accordingly to motor type
P1P2	Motor temperature monitoring **Off:** Temperature monitor deactivated **PTC:** thermistor (PTC according to DIN 44082) **TC:** Thermal circuit breaker **KTY:** Temperature sensor KTY84-130	Off PTC TC KTY	PTC
R_P1P2	Only accessible when P1P2=KTY is parameterised Resistance value at which the motor temperature monitor responds 1190 Ohm = 130 °C motor temperature	500 ... 5000 Ohm	1190
T_ENC	Encoder check time Time is started when the output signal "MB" is issued. If there no input signals from the pulse encoder are applied during this time, the inverter goes into malfunction	0.5 ... 7.0 s	2.0
T_CO	Debounce time of the motor contactor monitoring Monitoring time for the contactor interrupt. The power stage is switched off if the contactor contacts are open longer than the time configured in T_CO. The time T_CO is active upon interrupt during travel, not during a normal stop. Only accessible if the contactor monitoring is activated.	0.00 ... 100.0 ms 0.00=Off	10 ms
T_CDLY	Delay contactor monitor When the contactor monitor is switched on (menu "Monitoring/-CO") the reply must be available at the contactor monitor input within the time T_CDLY for the motor contactors to be closed (start up) or open (stop).	0.5 ... 7.0 s	1.5 s
T_BR	Debounce time for brake monitoring. The input signal is evaluated delayed by the time T_BR. Only accessible if the brake monitoring is activated.	0.01 ... 3.00 s	0.40
S_MB	Maximum distance with MB=Off If rotary encoder pulses are detected with the digital output "MB" is switched off, the inverter issues an error message if the configured path is exceeded.	0.10 ... 1.00 m	0.50
I_MAX	Protection against overload current depending on the nominal current of the motor If the configured value for "I_Max" (I x "I_MAX") is exceeded for the time "T_I_MAX" the inverter issues an error message.	20 ...180 %	180
T_I_MAX	Overcurrent protection If the value configured for time "T_I_MAX" in "I_MAX" (I x "I_MAX") is exceeded, the inverter issues an error message.	0.3 ... 10.0 s	5.0
APC	Automatic arameter control Suppression of up to five error messages through configuring the corresponding error number in an error mask	On Off	On
MASK1	Error mask 1...5 Suppression of up to five error messages through configuring the corresponding error number in an error mask	Error no.	0
MASK2			0

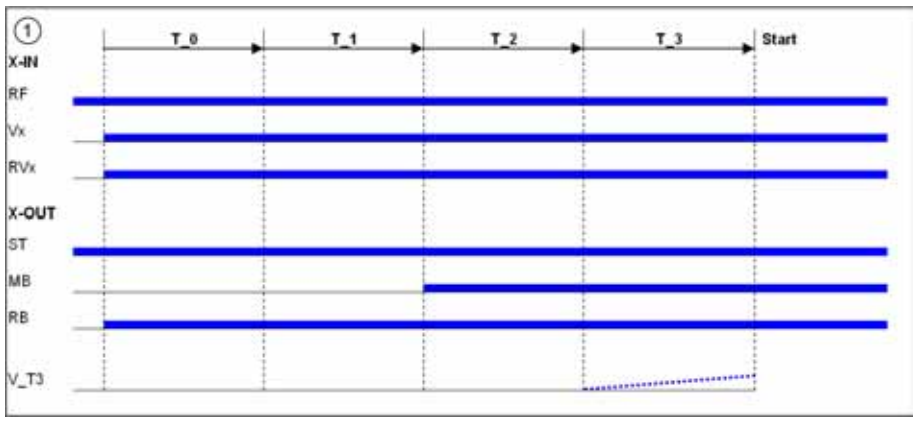
Parameter	Description	Value range	Factory setting
MASK3			0
MASK4			0
MASK5			0

10.8 Start menu

Chronological sequence from before the start of acceleration and optimization of the start-up behavior.

Parameter	Description	Value range	Factory setting
M_START	Control action to optimize the starting behavior (see chapter "Commissioning") **Off:** RPM control without gain at start (K_Start=1) **MOD1:**Speed control **MOD2:** Speed control + safety function **MOD3:**Speed + position control **MOD2:** Position control + safety function **MOD5:** Position control	Off MOD1 MOD2 MOD3 MOD4 MOD5	accordingly to motor type
K_START	Start gain Multiplicative factor for the parameter "Controller/SPD_KP" Increasing the PI controller during the start-up	is automatically limited	1.0
T_0	Max. motor contactor switch-on time Time during deactivated contactor monitoring ("Monitoring/CO=-Off") menu from applying the travel signal up to supply the contactors with current	0.0 … 10.0 s	0.5
T_0 real	Measured motor contactor switching time	Cannot be set	0.0
T_1	Flux build-up time Time to build-up the magnetic field in the motor (only with asynchronous motors)	0.0 … 10.0 s	0.2
T_2	Maximum brake opening time After expiration of time "T_1", the brake must have opened within time "T2"	0.0 … 15.0 s	0.6
T_2 real	Measured brake opening time	Cannot be set	0.0
T_3	Hold speed V_T3 Within time T_3, the machine accelerates up to the speed configured in V_T3	0.0 … 10.0 s	0.0
V_T3	Minimal speed to minimize starting jerk. Within time T_3, the machine is accelerated up to speed V_T3, thus overcoming the static friction.	0 … 50 mm/s	0
s_start	If the position of the machine changes during the start procedure by the configured value, amplification K_START is switched off (only with M_START=MOD2/4)	0.1 … 30 mm	3.0
BRK_DMP	Brake damping	AUS EIN	EIN

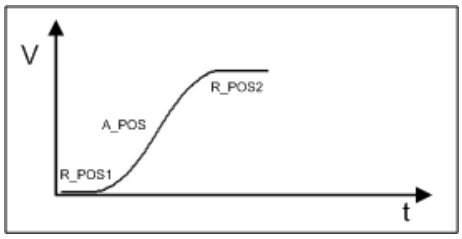
Start-up time sequence



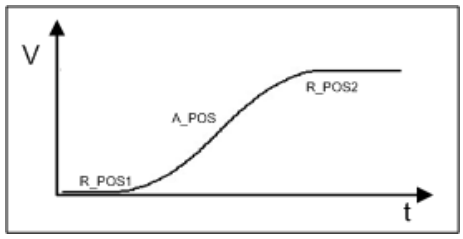
10.9 Acceleration menu

Definition of acceleration ramp.

Parameter	Description	Value range	Factory setting
A_POS	Positive acceleration	0.25 ... 2.00 m/s²	0.5
R_POS1	Lower round off during positive acceleration, a higher value causes a softer round off	20 ... 90 %	will be calculated
R_POS2	Upper round off during positive acceleration, a higher value causes a softer round off	20 ... 90 %	will be calculated



Acceleration with high A_POS and low R_POS1 and R_POS2



Acceleration with low A_POS and high R_POS1 and R_POS2

10.10 Travel menu

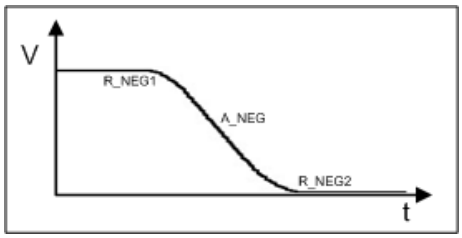
Traveling speed defaults

Parameter	Description	Value range	Factory setting
V_1	Positioning speed Speed to position during floor approach	0.010 ... 0.20 m/s	0.050
V_2	Intermediate speed Speed for normal traveling e.g. during travel to intermediate floor	0.03 ... 2.50 m/s	0.50
V_3	Travel Speed Speed for normal travel	0.03 ... 3.00 m/s	0.95
V_Z	Readjustment speed Speed for readjusting the car position during car loading or unloading	0.003 ... 0.30 m/s	0.05
V_4	Additional speed	0.03 ... 3.00 m/s	0.30
V_5	Additional speed	0.03 ... 3.00 m/s	0.30
V_6	Additional speed	0.03 ... 3.00 m/s	0.05
V_7	Additional speed	0.03 ... 3.00 m/s	0.05

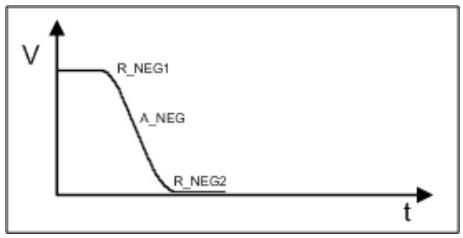
10.11 Decelerating menu

Defines the deceleration ramp and optimizes the positioning behavior.

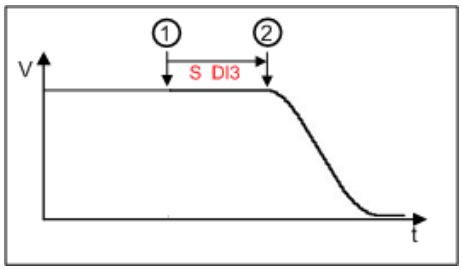
Parameter	Description	Value range	Factory setting
A_NEG	Negative acceleration	0.25 ... 2.00 m/s²	0.5
R_NEG1	Lower round off during negative acceleration, a higher value causes a softer round off	20 ... 90 %	will be calculated
R_NEG2	Lower round off during negative acceleration, a higher value causes a softer round off	20 ... 90 %	will be calculated
S_DI3	Dist. correction V3 Traveling speed V_3 is switched off, delayed by the configured value	0.00 ... 2.00 m	0
S_DI2	Dist. correction V2 Traveling speed V_2 is switched off, delayed by the configured value	0.00 ... 2.00 m	0
S_DI1	Dist. correction V1 Traveling speed V_1 is switched off, delayed by the configured value	0 ... 150 mm	0
S_ABH	Path dependent deceleration **ON:** path dependent deceleration, the deceleration paths are always identical **OFF:** time dependent deceleration, deceleration paths can be varied **DCP_fast, DCP_comf, DCP_slow:**Behavior during direct approach with DCP2 or DCP4 (see chapter "DCP mode") **V2toV3:**in distance-dependent travel with intermediate speed (V1 and V2 active) travelling speed V3 can be accelerated to	On Off DCP_fast DCP_comf DCP_slow V2toV3	On



Deceleration with low A_NEG and high R_NEG1 and R_NEG2



Deceleration with high A_NEG and low R_NEG1 and R_NEG2



Function S_DI

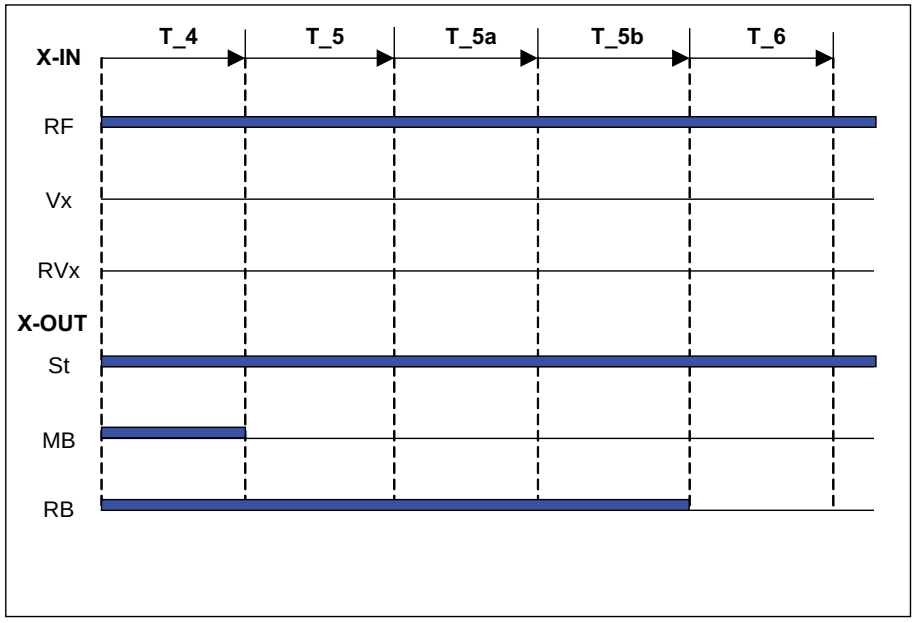
1 Switching of V3
2 Starting with deceleration

10.12 Stop menu

Chronological sequence after reaching speed 0 during stopping procedure.

Parameter	Description	Value range	Factory setting
T_4	Hold speed 0 During time T_4, the motor is maintained at speed 0 after reaching this speed	0.0 ... 10.0 s	0.1
T_5	Mech. Brake close time Time within which the mechanical brake must be closed	0.0 ... 10.0 s	0.6
T_5a	additional current feed at closed brakes	0.0 … 2.0 s	0.0
T_5b	S Wait until the motor is currentless Within time T_5b, the powering of the synchronous motor is decreased in a ramp function	0.0 … 2.0 s	0.3
T_6	Mot.Contactor switch-off time Time within which the contactor signal must be closed	0.0 ... 10.0 s	0.5

Stopping time sequence



10.13 Controller menu

Influences the speed control by the factor of the basic amplification (SPD_KP) and readjustment time (SPD_TI).
Seletion of the operation mode of the frequency inverter

Parameter	Description	Value range	Factory setting
SPD_KP	Multiplication factor to modify the calculated basic amplification SPD_C	is automatically limited	1.00
SPD_TI	Adjusting time Controller averaging time during the trip	5 ... 300 ms	100

Information
The paramters which are necessary for the Open-Loop-operation are only displayd with the paramter **C_MOD=U/f**. The parameters are described in the chapter Open-Loop-operation".

10.14 Parameter set 2 menu

A second set of parameters can be stored in the inverter. This can be used for:

- Emergency evacuation
- Normal travel with changed parameter values
- Parameter back-up

Parameter	Description	Value range	Factory setting
F_PAR2	Function allocation of parameter set 2 **Locked:** 2nd parameter set is blocked **2ndParameter set:** Activates the 2nd parameter set **EVAC 3B:** Emergency evacuation with evacuation module EVAC 3B **EVA. 3*AC:** Emergency evacuation through three-phase current emergency-generator **EVA. 1*AC:** Emergency evacuation through UPS **UPS:** Emergency evacuation through UPS (with decreased power)	Locked 2nd parameter set EVAC 3B EVA. 3*AC EVA. 1*AC UPS	Locked
U_ACCU	Accu nominal voltage Configuring the rated voltage of the rechargeable battery during evacuation with evacuation unit EVAC 3 ("f_PARA2=EVAC 3B", see "Emergency evacuation" chapter)	60 ... 565 V	120
P_UPS	Max. Load UPS Configuring the available power of the UPS during evacuation with UPS ("f_PARA2=UPS", see "Emergency evacuation" chapter)	0.0 ... 70.0kW	1.0
RS_UPS	Stator resistor Enter the resistor of the stator of themotor with "f_PARA2=UPS"	0.0 ... 9.99 Ohm	1.00
STOP	Stop function to improve the positioning accuracy in the evacuation mode "f_PARA2=UPS" **ON:** - Brake is closed when the switch point for V_1 is closed. - Brake is closed when the residual path configured in S_STOP has been reached (only for DCP02/04 **Off:** Stop function deactivated	On Off	Off
Copy	Copy parameter set **Off:** Function deactivated **PARA1->2:** copies the data from 1st parameter set into the 2nd parameter set	Off Para 1->2	Off

10.15 Statistic menu

All statistical data can be called up in the **Statistic** menu. The data remain saved even after the frequency inverter has been switched off. Reading out the error list and deleting the error memory are described in the "Error diagnosis" chapter.

Parameter	Description	Value range	Factory setting
ST_LST	Error list	Cannot be set	-
ST_H	Operating hours	Cannot be set	-
ST_DRV	Number of trips	Cannot be set	-
ST_RES	Number of mains interruptions	Cannot be set	-
ST_SRF	Number of travel aborts due to interruption of the controller enable RF during the travel	Cannot be set	-
ST_SCO	Number of trip aborts due to interruption of the contactor monitoring CO (opening of the contactor) during the travel	Cannot be set	-
ST_CRL	Delete error memory Deletes ST_LST, ST_RES and ST_SRF and ST_SCO	Cannot be set	-

Parameter	Description	Value range	Factory setting
APD	Automatic parameter diagnosis, see "Error diagnosis" chapter **On:** Automatic parameter diagnostics are activated **Off:** Automatic parameter diagnostics are deactivated	On Off	Off
RESET	Deletes parameters, counter levels and error lists, preassigning parameters with standard values. **RESET77:** **preset parametred frequency inverter:** Parameters will be set with customer specific datas **Standard frequency inverter:** Parameters will be set with standard data **RESET90:** Device reset, parameters remain preserved. ENC_-OFF stays. **RESET99:** Device reset, parameters deleted and assigned by the factory settings. S If a value is entered for the encoder offset (ECOFF), it will also be deleted!	Reset 77 Reset 90 Reset 99	0
TD_PWN	Assign password for the travel direction counter. A number between 0 and 9999 can be used as a password	0 ... 9999	0
TD_PWC	Displays the password in coded form. If you lose the password, please contact the manufacturer.	nicht einstellbar	21689
TD_PW	Enter password.	0 ... 9999 0 = no password	0
TD_CNT	Initial value of the down counter	0.00 ... 10.00 M	0.00

10.16 Memory Card menu

Contains the parameters for the various functions in association with a memory card.

Parameter	Description	Value range	Factory setting
SAV_ALL	Saves data to memory card with serial number allocation • Parameter list (.PRT) in directory /3BF/DEVICE/serieal number/LST • Error list (.FLT) in directory /3BF/DEVICE/serial number/LST • Parameter (.PA3) in directory /3BF/DEVICE/serial number/LST • Black-Box (.BOX) in directory /3BF/DEVICE/serial number/LST **Off:** no function **ON:** Data will be saved to the memory card. After copying, the parameter jumps back to "Off"	On Off	Off
SAV_PAR	Save parameters to memory card (copy parameters in the case of identical systems): • Parameter (.PA3) in directory /3BF/DEVICE/FORCE Here, there is no serial number allocation. The data will be overwritten during each saving **Off:** no function **ON:** Parameter will be saved to the memory card. After copying, the parameter jumps back to "Off"	On Off	Off
LOD_PAR	Load parameters from memory card to inverter (copy parameters in the case of identical systems) **Enter 27:** Parameter (.PA3) will be loaded from the /3BF/DEVICE/FORCE directory into the inverter After loading, the parameter jumps back to "off"	27	0
UPDATE	Starts the software update from a memory card. The most current software will always be loaded from the memory card **Enter 27:** Software will be loaded from the /3BF/Update/Softwareversion directory into the inverter	27	0

Parameter	Description	Value range	Factory setting
SAV_CFG	Saves data to memory card with configuration number allocation: • Parameter list (.PRT) in directory /3BF/CONFIG/configuration • Parameter (.PA3) in directory /3BF/CONFIG/configuration number	0 ... 59999	0
LOD_CFG	Load parameter from memory card to converter with specification of configuration number **Enter configuration number :** Parameters (.PA3) are loaded to the converter from the /3BF/CONFIG directory. The parameter jumps to "Off" again after loading	0 ... 59999	0
Format	Reformatting the memory card: **Enter 27:**Folders and files on the memory card will be deleted	27	0

10.17 MMC-Recorder menue

With the assistance of the memory card it is possible to make measurements on the frequency inverter without notbook. the measurement will be configurated in the MMC-Recorder menu.

Parameter	Description	Value range	Factory setting
REC_MOD	Recorder settings **Off:**Recorder is switched off **ON:** Recorder ist active, the operating curves are saved to the memory card **Stop&Shot:** Manual stopping and saving of a measurement which was started with MOD=ON". After saving the data on the memory card, REC_MOD will set to "Off" **ZETAMON:** Mode for using ZETAMON software The settings for REC_MOD can only be changed with REC_CFG=0	Off On Stop&Shot ZETAMON	ZETAMON
REC_CFG	Configuring the measurement channels **0:** all measurement channels and the recording time can be freely configured **1 … 9:** permanently set configurations that cannot be modified	0 1 2 3 4 5 6 7 8 9	1
REC_NUM	Directory number Number assignment for the file on the memor card. With entering "0" the serial number of the inverter will be used for the name of the file.		0
TRIG_BY	Trigger-source Specifications for stopping the recorder and saving the data to the memory card. **Error:** data will be saved as soon as an error occurs **Err/stop:** data will be saved as soon as an error occurs or an error-free travel is finished	Error Error/Stop	1.0

Parameter	Description	Value range	Factory setting
T_REC	Record-time Time for 1000 measurements For a recording time of 5 s, for example, measured values are recorded every 5 ms	5 s 10 s 15 s 20 s 40 s 80 s 160 s 0.5 h 1 h 24 h	5
T_DLY	Trigger Delay Delay time for stopping of the masurement. E.g. T_DLY=0.5s: the recording will be stopped 0.5s after an error occurs	0.5 s	0.5 s
CHN1	Configuration of the measuring channels 1-4 with analog measurement values **1:** setted speed [m/s] **3:** acutal speed [m/s] **6:** internal staus of the inverter **16:** flux build-up current [A]r **26:** motor current [A] **27:** motor voltage [V] **28:** voltage DC-link [V] **31:** temperatur power section [°C] **49:** covered total travel distance [m] **62:** residual path by the control system [mm] (only wirh DCP2 or DCP4) **119:** Capacity of the Brake-Chopper / Brake resistor **143:** torque build-up current [A]	1 3 6 15 16 26 27 28 31 49 62 119	3
CHN2			1
CHN3			143
CHN4			6
CHN5	Configuration of the measuring channel 5 with digital measurement values **89:** digital in- and outputs with indication of the function **90:** digital in- and outputs optimized for brake monitoring **91:** digital in- and outputs **92:** DCP-order and statusbits	89 90 91 92	89

10.18 Encoder adjustment menu

Contains parameter values required for aligning the SSI/EnDat rotary encoders for synchronous motors.

The procedure for entering the encoder alignment data is described in the "Special functions" chapter.

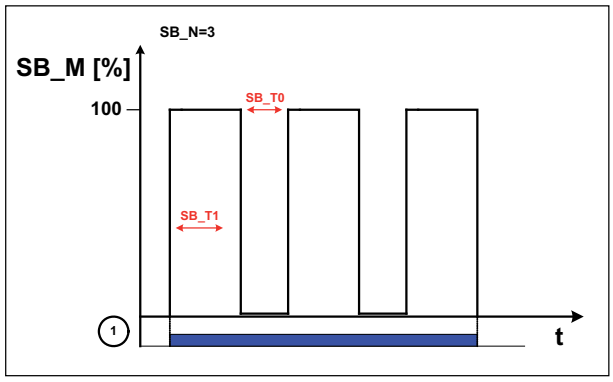
Parameter	Description	Value range	Factory setting
ENC_ADJ	Activating the encoder alignment **Off:** no function **ON:** Starts the encoder offset or control of the encoder offset alignment	On Off	Off
ENC_POS	Encoder Position Numerical display of the absolute position of the encoder per revolution: 0 … [4x number of grooves in encoder]-1	Cannot be set	-

Parameter	Description	Value range	Factory setting
ENC_OFF	Encoder Offset Shifts the zero position of the absolute rotary encoder to the pole's electrical zero position **EnDat encoder:** Default 0 is absolutely necessary **SSI encoder:** if the SSI encoder is not mechanically mounted in the zero position, the value ascertained during the offset alignment (ENC_ADJ) for ENC_OFF must be entered	0 ... 360.00°	0

10.19 Safety gear menu

Configuration of the data used for the "Safety gear" function.
The procedure for the safety brake is described in the "Special functions" chapter.

Parameter	Description	Value range	Factory setting
SB_MOD	Activate or deactivate the capture release **OFF:**Capture release is deactivated **On:** Starting the Safety-Brake-function in the requested direction by pressing the button "Inspection trip UP" oder "Inspection trip DOWN"	On Off	Off
SB_M	Default for pulse amplitude with which the motor is to be fed with current. The default is made as percent from the maximum inverter operating current (rated current x 1.8)	10 ... 100 %	70
SB_T0	Pulse breake Break time between the individual current pulses	0.1 ... 2.0 s	0.2
SB_T1	Împulse time Time for which the motor will be fed with current	0.1 ... 1.0 s	0.5
SB_N	Number of current pulses	1 ... 5	3



Process capture release

1 Inspection trip "UP" or "DOWN"

10.20 HW-Ident. menu

Identification of the individual assemblies in the frequency inverter. The identification of the assembly is generally downloaded directly from its EEPROM.
Manual input of the identification defaults is only necessary in case of malfunctions and replacements. To do so, enter the stored version number for the corresponding assembly.
If the number of the stored version numbers is exceeded, a 0 = automatic identification is entered

Parameter	Description	Value range	Factory setting
ID_NOK	The number of the changed hardware identification (identification-no. unequal 0) is indicated		

10.21 Power section menu

Configuring the tolerances of the internal power stage.

Parameter	Description	Value range	Factory setting
M_PWM	Pulse width modulation operating mode **Auto:** PWM frequency is changed depending on the power stage temperature and load At the start of travel, the motor voltage is cycled at the cycle frequency set in parameter "f_PWM_H". Cycle frequency is reduced if required. **Fix f_PWM:** motor voltage is permanently cycled at the PWM frequency set in the parameter "f_PWM"	Auto Fix f_PWM	Auto
f_PWM	Cycle frequency at parameter setting "M_PWM=Fix f_PWM"	2.5 ... 10.0 kHz	8.0
f_PWM_H	Maximum cycle frequency (start frequency) at parameter setting "M_PWM=Auto"	2.5 ... 16.0 kHz	16.0
UDC_N	DC voltage for the DC-link	100 ... 600 V	565
UDC_MIN	Minimum limit value of the DC-link voltage	30 ... 500 V	450
UDC_MAX	Maximum limit value of the DC-link voltage	300 ... 800 V	760
FAN_T	Power stage temperature at which the fan is switched on	28 ... 45 °C	33

10.22 CAN menu

Parametrize the CAN-specific functions.

Parameter	Description	Value range	Factory setting
LIFT_NR	Enter the lift number	1 ... 2	1
NODE_ID	Node number, normally: Control system: 1 Frequency inverter: 2 Encoder: 4	1 ... 128	2
BD_RATE	Bitrate	10 kBd ... 250 kBd	250 kBd
MODE	Operation mode of the ZETADYN 3	Position / Velocity	Position
T_CMD	Maximum waiting time for commands of the control system	200 ... 3000 ms	1500 ms

10.23 ZA-Intern menu

Parameterisation of internal measuring and monitoring functions

Parameter	Description	Value range	Factory setting
PW_S9	Password for the indication of additional parameter		0
UVW_CHK	Definition of motor phase checking on start-up **Single:** Motor phases will be check with the first travel after switching-on the inverter. With a successful control no more further examination is made. If the examination is incorrect, with each start an examination is made until a correct examination could be accomplished. **Cont:** Motor phases will be check with each travel **Off:** Checking of the motor phases is deactivated	Single Cont Off	Single
UVW_PEK	Test voltage for motor phase check **1 ... 10 V:** Selection of the test voltage between 1 V and 10 V. In case of an error the testing voltage is displayed in the error message. **15 V:**Test voltage 15V. **f(P):** The testing voltage depends on the nominal voltage of the motor, which is entered in the menu "Motor name plate". In case of an error the testing voltage is displayed in the error message.	1 ... 10 V 15 V f(P)	f(P)

Parameter	Description	Value range	Factory setting
n_ANA	Initialisation value for analogue input in ZETADYN 3-HY **Example:** n_ANA = 3000 analogue input = 0 - 10 V 10V = 3000 1/min	1 ... 3300	3000

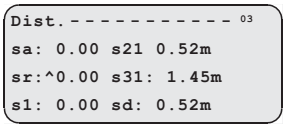
10.24 INFO menu

The INFO menu provides an easily accessible overview of:

- Current measurements
- Current operation conditions of the inverter
- Current switching states of the inputs and outputs
- Inverter internal measurements
- Information about the internal components

The individual pages are numbered for increased clarity.

Serial-No - - - - - - - - 01 ZETADYN 3BF013-A SN: 06128238/x001 3.24-110308xx	**Page 01: Serial-No.** **Line 2:** Indication of the inverter type and inverter size -A: Typ ZETADYN 3BF for asynchronous motors -S: Typ ZETADYN 3BF für synchronous motors -SD:Typ ZETADYN 3C with integrated brake contactors for synchronous machines -X: unknown type **Line 3:** Serial number/type consecutively numbered /0xxx: type ZETADYN 3BF /Dxxx:Type ZETADYN 3C with integrated brake contactors for synchronous machines **Line 4:** software version Loaded 3rd operating language
Status - - - - - - - - - - 02 ► Drive standby ◄ 530‹540‹550‹560‹ 100 ^0.00 0.00 0.00m/s	**Page 02: Status** **Line 2:** current service condition in plain text display **Line 3:** last 5 service conditions current operating condition is displayed on right in total, the last 60 service conditions can be inquired: Previous page Next page The current condition will be indicated with the arrows > < The previous conditions are indicated with the arrows < > **Line 4 (from left to right):** current direction of travel current position of car in the shaft current travel path with positioning speed current traveling speed



Page 03: Dist

Line 2:

sa: current position of car in the shaft

s21: calculated deceleration path V_2 ➧ V_1

s20: calculated deceleration path V_2 ➧ Standstill (only in DCP02/DCP04)

Line 3:

sr: current direction of travel, current total route

s31: calculated deceleration path V_2 ➧ V_1

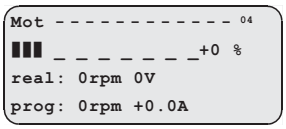
s30: calculated deceleration path V_3 ➧ Standstill (only in DCP02/DCP04)

Line 4:

s1: current travel path with positioning speed V_1 (not used in DCP02 / DCP04)

sd:real deceleration path V_3 ➧ V_1 or V_2 ➧ V_1

The display can be frozen by pressing the ↵ button.



Page 04: Mot

Line 2:

Bar chart of motor speed

A Slip in %

S Load angle in °

Line 3:

Actual motor speed

Motor voltage

Line 4:

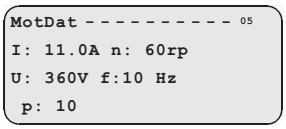
Target motor speed

Motor current

A

If the motor has been correctly adjusted, the slip is nearly proportional to the motor's rated current (e.g. 50% motor current = 50% slip).

The display can be frozen by pressing the ↵ button.



Page 05: MotDat

Display of the motor data entered in the "Motor name plate" menu:

S

Line 2:

Nominal current

Nominal speed

Line 3:

Nominal voltage

Rated frequency

Line 4:

Number of pole pairs

A

Line 2:

Nominal current

Nominal speed

Line 3:

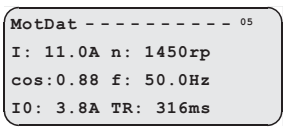
cos phi

Rated frequency

Line 4:

Magnetization current

Rotor time constant



MotDatFW- - - - - - - - - 05 I: 11.0A n: 1560rp cos:0.89 f: 53.4Hz I0: 3.5A TR: 316ms	**Page 05: MotDatFW** Display of the calculated motor data with field weakening operation: A **Line 2:** Nominal current Nominal speed **Line 3:** cos phi Rated frequency **Line 4:** Magnetization current Rotor time constant
MotDatNom - - - - - - - - 05 I: 11.0A n: 1450rp cos:0.88 f: 50.0Hz I0: 3.8A TR: 316ms	**Seite 05: MotDatNom** By pressing the ↵ button, the original motor date wiill be displayed
RegLimits - - - - - - - - 06 SP IQ ID PS U LIM:.. •. .. .. . PEK:	**Page 06: RegLimits** Online display of whether a control loop has reached the limit **Line 2:** SP: Speed controller IQ: Current controller (torque creation current) ID: Current controller (flux creation current) PS: Position controller U: Frequency-inverter voltage limit **Line 3:** Alarm bell left: minimum limit reached Alarm bell right: maximum limit reached No alarm bell should appear during a faultless, normal trip.
Brems-Chopper - - - - - 07 Intern 1.4kHz BC • U_DC:_ _ _ _ _ _ 565V Ampl:_ _ _ _ _ _0%	**Page 07: Brake-Chopper** Online-display **Line 2:** Internal PWM frequency (only for brake resistor) Condition of function and temperature monitoring on input terminal BC (larger point = OK) **Line 3:** DC-link voltage as bar chart display DC-link voltage **Line 4 (only with Brake resistor):** Modulation of Brake resistor as bar chart display Modulation of Brake resistor in % The DC-link voltage displayed in standstill must have the value “Mains connection voltage x 1,41". A large point must constantly be displayed behind the function and condition monitor. Pressing the ↵ button Display will be frozen Display of the loaf of the brake resistor (average value over 120s)

Cu-Functions- - - - - - 08 CONFIG 00: Frei I:RF RV.2 V..... O:.. .. .. VG1	**Page 08: Cu-Functions** Online-display **Line 2:** Selected control system configuration in menu "Control system/CONFIG" **Line 3:** Active digital input functions: • Controller enable (RF) • Direction of travel (RV) • Traveling speed (V) **Line 4:** Active digital output functions
Start/Stop - - - - - - - 09 RF RB CO MB BR1234 •	**Page 09: Start / Stop** Online display of the digital inputs and outputs important for the start / stop process: **Line 3:** RF – Controller enable (input) RB – Controller ready / Contactors switching (output) CO – Contactor monitoring (input) MB – mechanical brake switching (output) BRx – Brake monitoring contacts **Line 4:** A big dot below the description displays the input or output is active A "!" under the monitor input "CO" or "BR" indicates that this monitoring function has been deactivated in the "Monitoring" menu.
Cu-Ports- - - - - - - - - 10 In: Out: 12345678 BC C12 1234 .... • .. ...•	**Page 10: Cu-Ports** Online-display **Line 3:** 1…8: digital inputs I1…I8 BC: Function and temperature monitoring of brake resistor or brake chopper C12: Contactor monitoring 1…4: digital outputs O1…O4 **Line 4:** A big dot below the description displays the input or output is active
Encoder - - - - - - - - - 11 Incr:2048 Typ:ENDAT Enable•• Err: 0 Cnt:9941=345° A B	**Page 11: Encoder** Online-display **Line 2:** Configured encoder resolution Detected encoder type (with absolute encoders) Configured encoder type (with incremental encoders) **Line 3:** Enable first point: Enabling of the supply voltage for absolute rotary encoder Enable second point: Absolute rotary encoder performance test S both points must be active A both points must be off ERR: Error code from encoder, if the encoder is faultless, 0 must be displayed. **Line 4:** Cnt: counter reading for pulse counter (0 - 4x encoder resolution) and display of motor revolution in degrees (360° = one revolution of the motor) A and B: graphic display of the sine signal (A) and cos signal (B) The display can be frozen by pressing the ↵ button.

Power1 - - - - - - - - - - 12 DC IGBT PWM ED: 10% •• •• .. ▌ FAN: 0% UDC:565V Temp: 28C	**Page 12: Power1** Power stage condition (point for condition OK) **Line 2 und 3:** DC: first point: Precharge relay switched on second point: Power stage power supply both points must be active during normal operation IGBT: first point: ower stage power supply second point: Power stage power supply OK both points must be active during normal operation PWM: first point: PWM power stage enabled second point: Power stage power supply OK Both points are only active during driving Bar display under M: narrow: Clock frequency 4 kHz fixed medium: Clock frequency 8 kHz wide: Clock frequency 16 kHz ED: Turn on duration of the frequency converter (time interval: 10 minutes) FAN: Speed of the fan in % **Line 4:** UDC: DC-link voltage Temp: Power stage temperature The display can be frozen by pressing the ↵ button.
Power2 - - - - - - - - - - 13 ERR_EXT U. OC: ... SRC_APP. UCE_P: ... SRC_MOP. UCE_M:	**Page 12: Power2** Cause for excess current malfunction **Line 2:** ERR_EXT: Excess current message (display is not saved; point is only displayed if excess current is present U: Overvoltage error in the DC-link (voltage higher than 850 V DC) OC: Overcurrent was detected by the current sensors (incorrect phase is indicated by letters U V W) **Line 3:** SRC_APP: Excess current is detected by the application processor. UCE_P: Error in positive current path in power stage (faulty phase is displayed) **Line 4:** SRC_MOP: Excess current is detected by the motor management processor. UCE_M: Error in negative current path in power stage (faulty phase is displayed) During normal operation, no points and phase displays (U V W) should be active During a malfunction, the displays remain active until the next travel command (with the exception of ERR_EXT)
DCP-Ident - - - - - - - - 14 Info: **xx** 0101 / 010106 de Load: 77% - 12.3A	**Page 14: DCP-Ident** Information about the control system **Line 2:** Manufacturer **Line 3:** Software version of control system Software date of the control system Operating language set in the control system, display according to ISO639 The operating language of the inverter is automatically adapted **Line 4 (only with DCP4):** Load in % (0% = cabin empty) Load-dependent start torque current

DCP-Bits- - - - - - - - - 15 B..... G..... S..... 100	**Page 15: DCP-Bits** Online-display **Line 2:** Command and speed bytes B= command byte G= speed byte **Line 3:** Status byte S= Statusbyte Current service condition in which the frequency inverter is operating **Line 4:** actual travel command
Display 1 DCP-Dist. - - - - - - - - 16 sv_I7: +0002210 mm sv: +0002198 mm Prg:Rea !Calc mode! **Display 2** DCP-Dist. - - - - - - - - 16 sv_I7: +0002210 mm sv: +0002198 mm Prg:Rea 1.15:x.xxm/s **Display 3** DCP-Dist. - - - - - - - - 16 sv_I7: +0002210 mm sv: +0002198 mm Prg:Rea 1.15:1.10m/s	**Page 16: DCP-Dist.** Online-display **Line 2:** Display of the current remaining path **Line 3:** Display of the remaining path required **Line 4:** **Display 1:** Display when MOD_n* on "calculate" **Display 2:** Shows the ratio of set nominal speed to real speed. Display when MOD_n* on "direct" during travel. (providing that the controller supports the "I9" position telegram) **Display 3:** Shows the ratio of set nominal speed to real speed. Display when MOD_n* on "direct" after travel. (providing that the controller supports the "I9" position telegram)
DCP-Err - - - - - - - - - 17 RX_TIM 1 RX_XOR 0 TX_ERR 0	**Page 17: DCP-Err** Online display of transmission errors that increase the counter level during running operation as soon as transmission errors occur: **Line 2:** RX_TIM: Timing (open loop control does not answer within the cycle time **Line 3:** RX_XOR: erroneous open loop control telegram is detected by inverter **Line 4:** TX_ERR: erroneous inverter telegram is detected by the open loop control
CAN- - - - - - - - - - - - - - 14 Act• Mode: Velocity T_max: 0 RErr:255 NMT:Preop./Warn.Lim:	**Page 14: CAN** Operating information (normal view) **Line 2:** Act: A dot signalizes that the inverter operates with CAN Mode: Operating mode (velocity or position) **Line 3:** T_max: Number of cycles, which excessed the maximum process time RErr: Recieve buffer - error counter **Line 4:** NMT: Shows the actual NMT status (see table 4.3)
CAN- - - - - - - - - - - - - - 14 Act• Mode: Velocity T_max:0.7ms TErr:255 NMT:Preop./Warn.Lim:	**Page 14: CAN** Operating information (while pressing "Enter") **Line 2:** Act: A dot signalizes that the inverter operates with CAN Mode: Operating mode (velocity or position) **Line 3:** T_max: Maximum time for processing the CAN messges per cycle, since switch-on TErr: Transmit buffer - error counter **Line 4:** NMT: Shows the actual NMT status (see table 4.3)

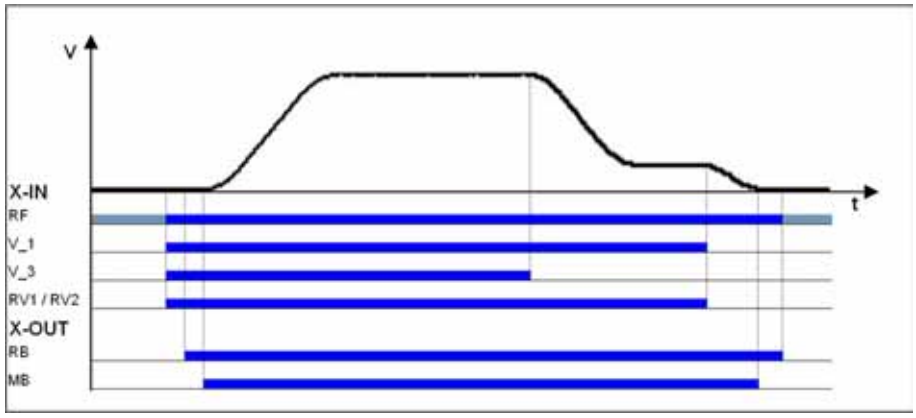
CAN Velocity------ - 15 V_CAN: + 0mm/s Contr.:Disable Volt. Status:Sw. On Disab.	**Page 15: CAN Velocity** Active in velocity mode **Line 2:** V_CAN: Travel speed, sent fron the control system to the ZETADYN 3. **Line 3:** Contr. Control-byte. Shows commands which are sent by the control system **Line 4:** Status: Status-byte. Shows CAN-status of the ZETADYN 3
CAN Position------ - 16 S_CAN + 0mm Contr.:Disab. Volt. Status:Sw.On Disab.	**Page 16: CAN Position** Active in position mode **Line 2:** S_CAN: Relative target position, sent from the control system to the ZETADYN 3 **Line 3:** Contr. Control-byte. Shows commands which are sent by the control system **Line 4:** Status: Status-byte. Shows CAN-status of the ZETADYN 3 **After pressing the "Enter" button the display shows the maximum travel speed, sent by the control system**
CAN Calib. 1------ - 17 AbsEnc mm: 5358 MotEnc mm:+ 4169 Offs:13081A/M 1.28	**Page 17: CAN Calib.** Calibration **Lines 2 - 4:** For calibrating the distances which were sent by the motor encoder and the shaft encoder.
A+R ---------- 18 0.62 0.62 m/s3 0.50 0.50 m/s2 0.62 0.50 m/s3	**Page 18: A&R** Display of configured values for: • Rampup time • Rampdown time dependent on the operating curve of a normal ride **Line 2:** upper round off of the acceleration in m/s³ upper round off of the deceleration in m/s³ **Line 3:** Acceleration in m/s³ Deceleration in m/s³ **Line 4:** lower round off of the acceleration in m/s³ lower round off of the deceleration in m/s³

InfoBus ---------- 19 Ident-No 01234567 Exist: xxxx Error 0000	**Page 19: InfoBus** Display of the inverter configuration **Line 2:** Ident no. of the internal assemblies 0: Controller Unit (CU) 1: Shunt module (CUSH) 2: Expansion card DCP / CAN (CUEC) 3: Expansion card, encoder (CUEE) 4: reserved 5: Switching Power Print (SP) 6: Power Print (PP) 7: Module Print (MP) **Line 3:** Each board which implemented to the inverter will be indicated (see also menu "HW-Ident."): x: indentification of the board by reading out the EEPROM m: identification by manual default in the menu "HW-Ident." **Line 4:** Error allocation of the assembly 1: No answer 2: Incorrect or unknown object 3: No proper EEPROM connection 4: No or unknown part number 5: No or unknown index 6: Original and backup copy are not identical During flawless operation, all internal assemblies must be displayed with a "0"
TravelDirection --- 20 TD_SET 10.00 M TD_CNT 4.32 M TD_DRV 18.45 M	**Page 20: TravelDirection** Display the direction changes **Line 2:** TD_SET: Initial value of the down counter **Line 3:** TD_CNT: Travel direction counter, resettable. Displays the remained travel direction changes with the actual rope. After resetting the travel direction counter, TD_RES will be increased **Line 4:** TD_DRV: Total counter of the travel direction changes. Value remains after resetting the down counter
TravelDirection --- 20 TD_RES 10 TD_CNT 4.32 M TD_DRV 18.45 M	**Page 20: TravelDirection** While pressing the ↵ button, **line 2** shows the actual number of counter resets "TD_RES".
Cuec ---------- 21 Typ: B1013AA-02 Func: DCP & CAN Stat: GRN	**Page 21: Cuec** Expansion board "Control" **Line 2:** Type: Part number of the expansion board "Control" **Line 3:** Func: Functions of the expansion board "Control" **Line 4:** Stat: LED status of the expansion board "Control"

11 Travel options

11.1 Normal travel

The figure shows the sequence of a trip between two floors with the corresponding input and output signal processes. You can find a detailed description of the various acceleration and deceleration processes in this chapter.



Normal travel

RF Controller enable
V_1 Positioning speed
V_3 Travel Speed
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake

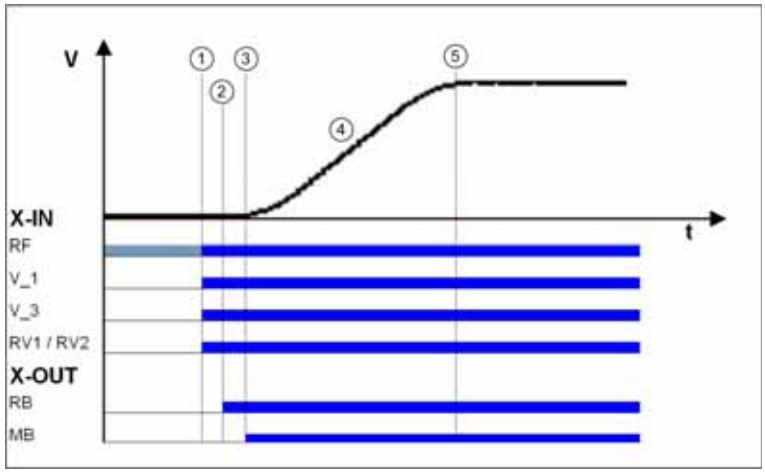
11.2 Start-up and acceleration

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

- Controller enable (RF)
- Speed (V_1, V_2 or V_3)
- Default of travel direction (RV1 or RV2)

Start-up procedure with acceleration

1	The elevator control system triggers the following inverter inputs: • Controller enable (RF), can already be triggered • Speed V_1 and V_3 • Direction of travel RV1
2	The inverter switches the digital output "Controller ready RB" time-delayed. The motor contactors must be switched instantaneously with this signal
3	The inverter switches the digital output "Mechanical brake MB" time-delayed. The motor brakes must be opened instantaneously with this signal
4	The controller accelerates the motor up to the highest triggered speed (V_3) according to the set acceleration and round off.
5	Target speed V_3 has been reached



Start-up and acceleration

RF Controller enable
V_1 Positioning speed
V_3 Travel Speed
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake

11.3 Traveling speed defaults

After entering the installation specifications and carrying out the automatic parameter assignment, the traveling speeds “V_2” and “V_3” are pre-configured in the **Travelling** menu, dependent on “V*”.

Designation	Parameter	pre-signment
Intermediate speed V_2	V_2	50% V*
Travel speed V_3	V_3	100% V*

The speeds listed in the table below are permanently preset and thus independent of “V*”.

Designation	Parameter	pre-signment
Positioning speed	V_1	0,05 m/s
Readjustment speed	V_Z	0,05 m/s
Additional speed V_4	V_4	0,32 m/s
Additional speed V_5	V_5	0,32 m/s
Additional speed V_6	V_6	0,32 m/s
Additional speed V_7	V_7	0,32 m/s

11.4 Distance-dependent deceleration

In a path-dependent deceleration, the deceleration paths are always identical. Independent of the speed reached at the start of the deceleration.
The path-dependent deceleration can be activated in the menu **Decelerating/S_ABH = ON**
Path dependent deceleration is carried out during deceleration of:

- V3 ⇢ V1
- V2 ⇢ V1
- V3 ⇢ Drehzahl 0 (only in DCP2/DCP4 protocol)
- V3 ⇢ Drehzahl 0 (only in DCP2/DCP4 protocol)

During all other switchovers between two speeds, the deceleration is carried out time-dependent.

Information

Before removing the digital input for the travelling speeds V_3 or V_2, the input for the travelling speed V_1 must be applied (see diagram).
If it is not possible to control two travelling speeds simultaneously for technical reasons (e.g. control of the speeds by an alternating contact), the distance-dependent delay with the **Control system/SIM_-V1=ON** parameter can be activated!
Here it must be noted that the positioning speed V_1 must be activated 100 ms after deactivation of the travelling speeds V_3 or V_2 at the latest!

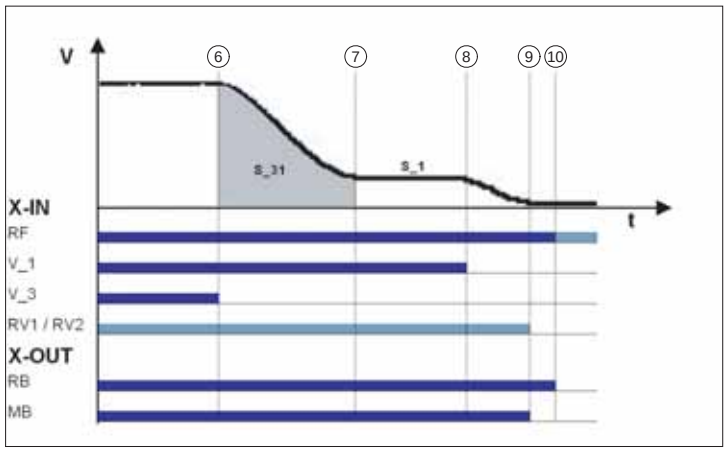
If binary speed is specified, there is only a distance-dependent delay at **Control system/SIM_V1=ON**!

Information

If the signal for the higher traveling speed (e.g. V_3) is switched off for a short time, the inverter decelerates the motor to positioning speed V_1. For safety reasons, retriggering a higher traveling speed is ignored. Triggering at a higher traveling speeds is only possible after all the inputs for the traveling speed have been switched off and the motor has reached the speed 0.

11.4.1 Normal stop during path dependent deceleration

6	When the switch off point for the traveling speed is reached, the configured final speed V_3 has been reached. Deceleration is initiated
7	Travel at positioning speed V_1
8	Positioning speed V_1 is switched off. Motor continues to decelerate.
9	Speed 0 Output MB is switched off Brake must operate immediately The motor continues to be fed with current
10	The current to the motor is switched off Output RB is switched off Motor contactors must drop immediately



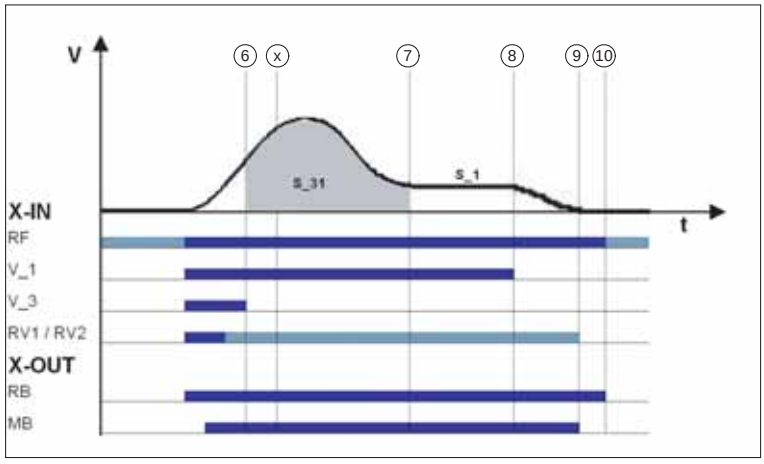
Normal stop during path dependent deceleration

RF Controller enable
V_1 Positioning speed
V_3 Travel Speed
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake

11.4.2 Arch travel with path-dependent deceleration

If the selected final speed (V_2 or V_3) is not reached with short floor clearances, the frequency inverter carries out arch travel. Independent of the speed reached upon the interrupt time point, the identical crawl paths are always achieved through the arch travel.

6	When the switch off point for the traveling speed is reached, the configured final speed is not yet reached. The motor continues to be accelerated. The point from which the deceleration must be initiated is calculated.
X	Deceleration is initiated
7	Travel at positioning speed V_1
8	Positioning speed V_1 is switched off. Motor continues to decelerate.
9	Speed 0 Output MB is switched off Brake must operate immediately The motor continues to be fed with current
10	The current to the motor is switched off Output RB is switched off Motor contactors must drop immediately



Arch travel

RF Controller enable
V_1 Positioning speed
V_3 Travel Speed
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake

That means that during a normal trip and during arch travel, the deceleration path V3 ◦ V1 (S_31) and the crawl path V1 ◦ speed 0 (S_10, only with DCP2/DCP4) are identical.

11.5 Time-dependent deceleration

Time-dependent deceleration is activated for all speed transitions if the menu **Decelerating / S_ABH = OFF**.

With the exception of decelerations of:

- V_3 ◦ V_1
- V_2 ◦ V_1

the decelerations are operated time-dependent. They are independent from the configured function of the parameter **Decelerating / S_ABH**

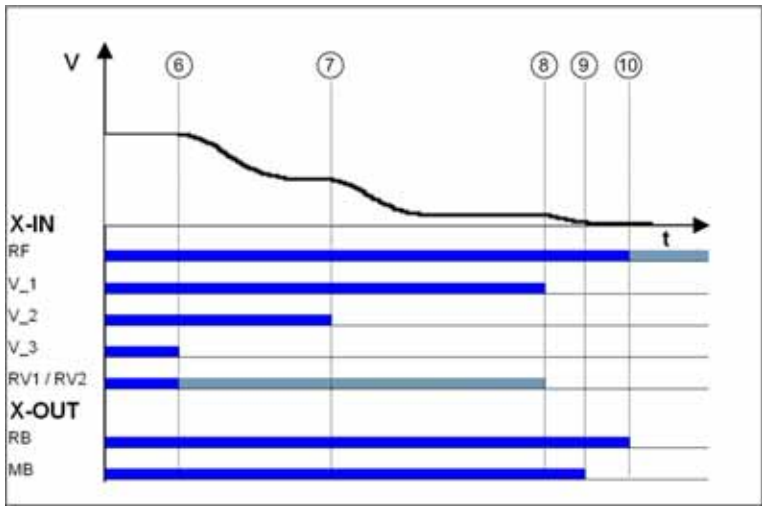
After switching off the current speed preset, the motor is decelerated time-dependent, according to the configured decelerations and round offs, to the highest speed still triggered.

Information

In a time-dependent deceleration, the deceleration paths vary dependent on the speed attained at the time the deceleration starts. For this reason, time-dependent deceleration only makes sense if traveling speed is reached during each trip.

11.5.1 Deceleration with reached traveling speed

6	When the switch off point for the traveling speed is reached, the configured final speed V_3 has been reached. Deceleration to V_2 is initiated
7	Switch off point for V_2 Deceleration to V_1 is initiated
8	Positioning speed V_1 is switched off. Motor continues to decelerate.
9	Speed 0 Output MB is switched off Brake must operate immediately The motor continues to be fed with current
10	The current to the motor is switched off Output RB is switched off Motor contactors must drop immediately

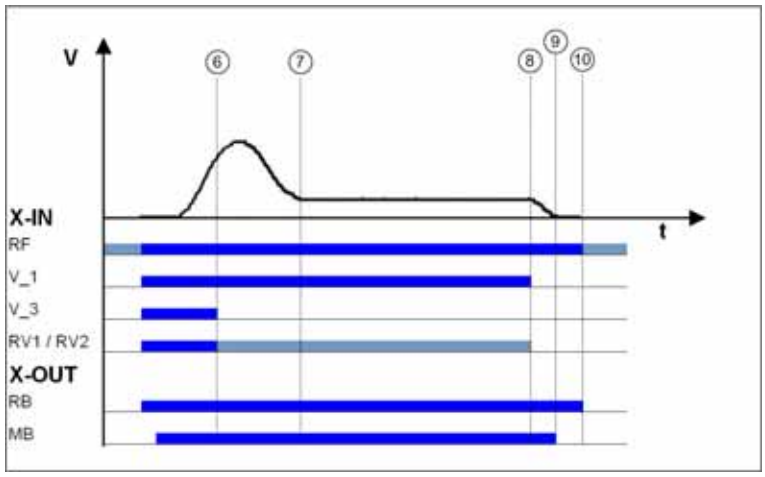


Time-dependent deceleration with reached traveling speed

RF Controller enable
V_1 Positioning speed
V_2 Intermediate speed
V_3 Travel Speed
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake

11.5.2 Deceleration when traveling speed has not been reached

6	When the switch off point for the traveling speed is reached, the configured final speed V_3 is not reached. Deceleration is initiated
7	Travel at positioning speed V_1
8	Positioning speed V_1 is switched off. Motor continues to decelerate.
9	Speed 0 Output MB is switched off Brake must operate immediately The motor continues to be fed with current
10	The current to the motor is switched off Output RB is switched off Motor contactors must drop immediately



Deceleration when traveling speed has not been reached

RF Controller enable
V_1 Positioning speed
V_3 Travel Speed
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake

Information
If the trip duration is monitored by the open loop control, due to the long trip time with a traveling speed of V_1 an error message may result!

Information
If the traveling speed is switched off just before the preset final speed has been reached, it could happen that the floor is overshot.

11.6 Crawl path optimization

Improvement of:

- too long crawl paths with traveling speed V_1
- non-flush stopping due to V1 being prematurely switched off

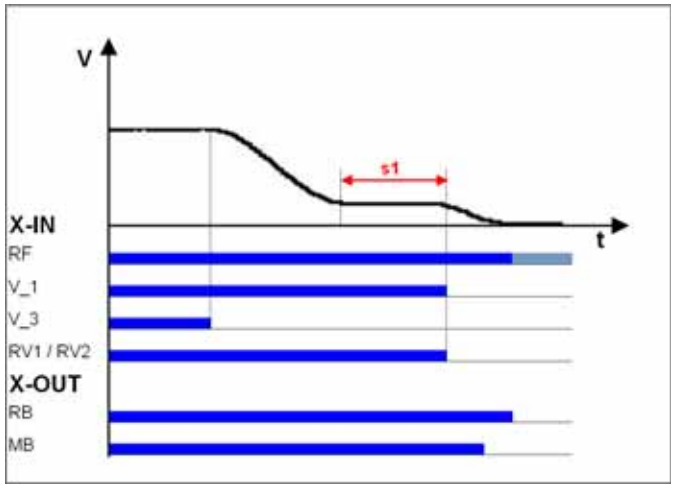
without additional installation work.

Using the crawl path optimization in the menu:
Decelerating / S_DI1
Decelerating / S_DI2
Decelerating / S_DI3
the traveling speeds V_1, V_2 and V_3 are switched off in all floors delayed by the value configured in the corresponding menu.

Optimizing the crawl paths

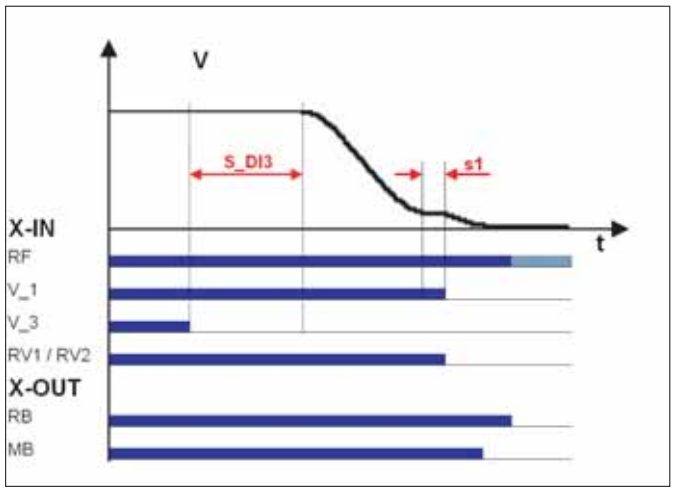
1	Travel to each floor from both directions of travel with the max. traveling speed V_3 or V_2 and check the crawl path s1 in the "INFO / Page 03" menu. Dist. - - - - - - - - - - 03 sa: 0.00 s21 0.52m sr:^0.00 s31: 1.45m s1: 0.00 sd: 0.52m
2	The value for s1 should be the same for all floors from both travel directions. If the crawl paths differ, use the smallest value for s1.
3	In the **Decelerating** menu, change the values for S_DI3 or S_DI2 to that determined for s1
4	Check the deceleration behavior and, if necessary, correct the values for S_DI3 or S_DI2.

Information
If s1 has different values, it is not possible to get the same crawl path in all floors!



Deceleration with non-optimized crawl path

RF Controller enable
V_1 Positioning speed
V_3 Travel Speed
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake



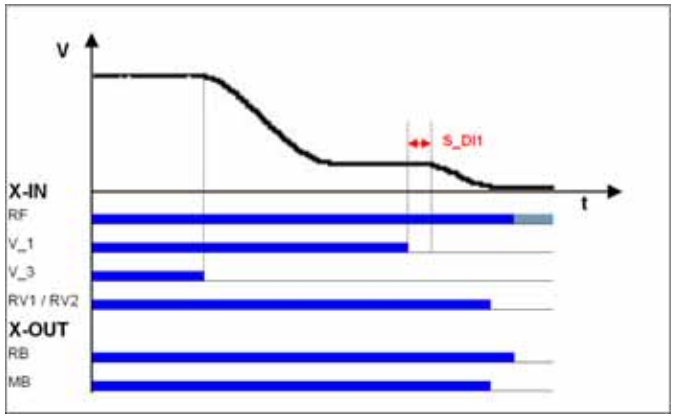
Deceleration with optimized crawl path

RF Controller enable
V_1 Positioning speed
V_3 Travel Speed
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake

11.7 Optimizing the step alignment

1	Ascertain the distance of the flush in each floor by measuring manually
2	The clearance should be the same in all floors when approaching from both directions. If the values differ, use the smallest value determined.
3	In the **Decelerating** menu, configure the value for S_DI1 to the ascertained value.
4	Check the deceleration behavior and, if necessary, correct the values for S_DI1.

Information
If there are different distances to the flush alignments, it is not possible to travel flush to all floors by modifying S_DI1!



Optimizing the step alignment

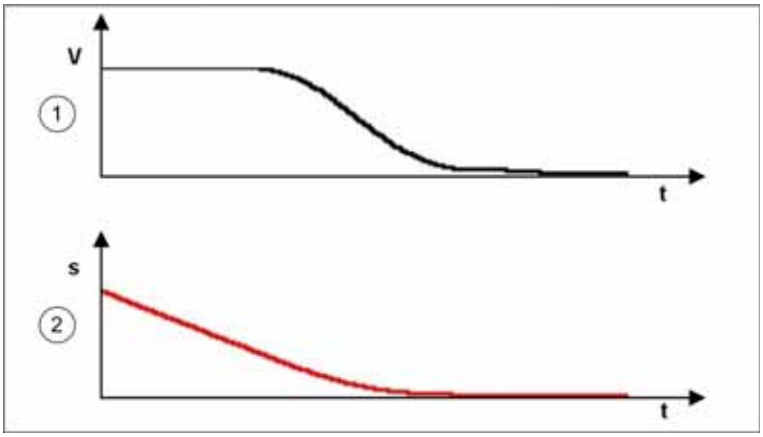
RF Controller enable
V_1 Positioning speed
V_3 Travel Speed
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake

11.8 Direct leveling

Information

Direct leveling is only possible when using the DCP2 or DCP4 protocols and an absolute shaft copy system!

During direct leveling, the control system predetermines the frequency inverter the residual path to be traveled up to the stopping point.
The inverter decelerates the motor, dependent on the preset remaining path. As a consequence, it is possible to travel to the stop point without a crawl path.



Direct leveling with DCP protocol

1 Travel speed V_3
2 Residual distance

11.9 Readjustment

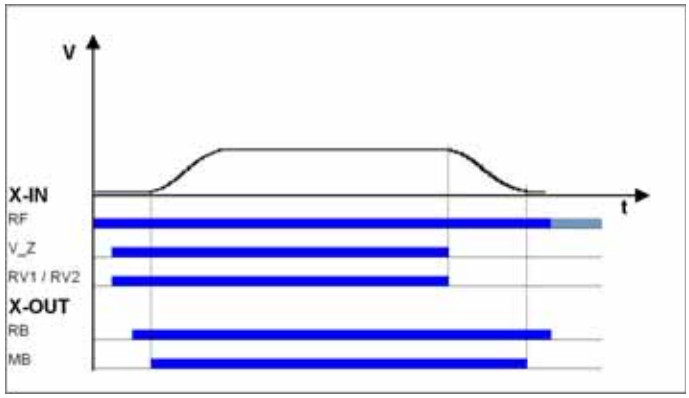
Correction of the rope elongation under load and relieving the load on the car. The rope elongation is evaluated by the control system.
The readjustment speed is configured in the **Travelling / V_Z"** menu and controlled through a digital input (configured to V_Z).

Information
The traveling speed for readjustment takes precedence over the other traveling speeds.

To be able to make a readjustment, at least the following input signals need to be present:

- Controller enable
- Readjustment speed V_Z
- Direction default

Information
To prevent oscillation, the control system must wait a suitable amount of time until the rope comes to rest before the readjustment is activated.



Readjustment speed

RF Controller enable
V_Z Readjustment speed
RB Controller ready
MB_Brake Mechanical brake

11.10 Operation in idle

With the ZETADYN frequency inverter, both synchronous as well as asynchronous motors can be operated in an idle state.

CAUTION!

Caution!

When operating synchronous motors in idle, strong vibrations and noise development can result! Therefore, the factor for the speed controller basic-amplification "SPD_KP" must be reduced to approx. 0.1%.

```
Controller
↳SPD_KP  1.00
  ↳      0.10
SPD_REG: Base-gain
```

11.11 Fast-start

The motor is energized as the cabin door closes and the mechanical brake is opened. Motor speed is controlled to 0. This makes it possible to start travel immediately the door is closed.

Information

The Quickstart function may only be used in the door zone range in elevators with adjustment control. The regulations of DIN EN 81-1 must be observed.

11.11.1 Control system

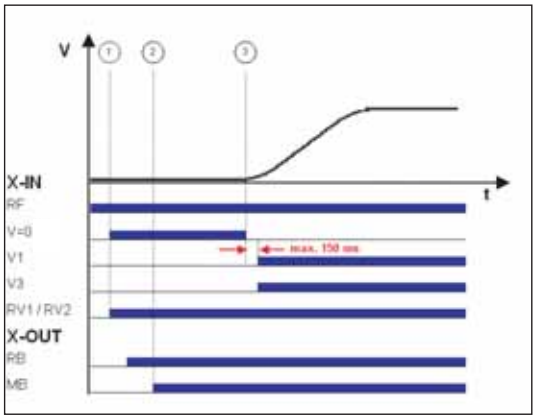
Configure digital input in the **Control system** menu to **v=0**.

```
Controll system
↳f_I08   v=0
  ↳      v=0
Function of I08
```

	Standard	DCP
1	Cabin door closing Actuation of inputs: • RF - Controller enable • RVx - Default for travel direction • v=0 - Hold speed 0 Activation of output: • RB - Controller ready Motor contacts must be switched without a delay. Motor energized	Cabin door closing Setting the bits by lift control: • G2 - RPM 0 • B1 – travel command • B2 – off switch • B3 – travelling speed • B4 – travel direction Setting the bits by frequency converter: • S1 – travel active Motor contacts must be switched without a delay. Motor energized
2	Activation of output: • MB – mechanical brake Motor brake must be opened without a delay. Motor speed is controlled to 0.	Setting the bits by frequency converter: • S6 - mechanical brake Motor brake must be opened without a delay. Motor speed is controlled to 0.
3	Cabin door is closed Deactivation of input: • v=0 - Hold speed 0 Actuation of inputs: • V1 - Positioning speed or • V2 - Intermediate speed or • V3 - travel speed Travel speeds must be actuated no more than 150 ms after input "v=0" has been deactivated!	Cabin door is closed Setting the bits by lift control: • G6 - Intermediate speed or • G7 – fast speed • B3 – travelling speed Cancelling the bits by lift control: • G2 - RPM 0 Travel speeds must be actuated no more than 150 ms after input "v=0" has been deactivated!

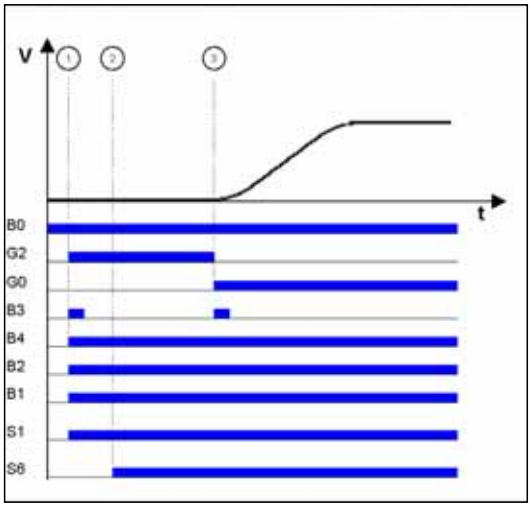
Caution!

Danger from traveling with cabin door open!
In order to prevent premature starting up in the event of a defective input or fractured wire for the "Hold speed 0" function, the signals for travel speeds should only be applied after the "Hold speed 0" function has been switched off!



Quickstart with standard actuation

RF Controller enable
v=0 Hold speed 0
V1 Positioning speed
V3 Travel speed V_3
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake



Quick start with DCP actuation

B0 Converter enable
B1 Travel command
B2 Off switch
B3 Travel speed V_3
B4 Direction default
S1 Travel active
S6 Mechanical brake
G2 Speed 0
G7 Travel speed

11.11.2 Monitoring functions for Quickstart

- If the drive is maintained at speed 0 for longer than 20 s, the inverter goes to fault mode, displaying **ERR780/Quickst. t-limit**
- If the input signal "Drehzahl 0 halten" is set during travel, the inverter goes to fault mode, displaying **ERR781 / Quick. bei Fahrt**
- If the motor moves by more than ± 7 mm with the input set to speed 0, the frequency inverter goes to fault mode, displaying **ERR529 / Quickstart Alarm**
- the monitoring time for the encoder (T_GUE) is started after the function "Drehzahl 0" has been switched off

12 Emergency evacuation

12.1 Evacuation with 1-phase mains supply 230V AC

Information
The methods of Emergency Evacuation, described in this chapter, are only possible with the types ZETADYN 3BF011 - ZETADYN 3BF074.

Due to the low power requirements of a synchronous drive, it is possible to carry out an evacuation trip in the motoric and generatoric direction.

Due to the high level of magnetization current, emergency evacuation with a single-phase mains supply with asynchronous motors does not make sense.

Characteristics of evacuation with single-phase mains supply:
- Evacuation in motoric and generatoric direction
- Load-independent starts
- Load-independent stopping
- Flush stopping

If there is a mains failure, the mains supply must provide the following voltage to the inverter:
- 230 VAC to feed L1 and L2

The frequency inverter analyses the load ratio between the car and the counterweight during every start.
The control system starts the evacuation trip by activating:
- Controller enable
- Direction default
- Speed default

Calculation of the UPS

	The required UPS performance consists of the following:
	Electronic frequency inverter power consumption
+	Control systempower consumption
+	Electromechanical brakes power consumption
+	Other consumers (car light, …) power consumption
+	Motor power consumption during motoric operation with sufficient power (ask motor manufacturer)
=	**Real power UPS [W]**

Information
The shaft efficiency has a decisive influence on the required power of the single-phase mains supply.

12.1.1 Parameterisation

(1) The following prerequisites must be present:
The direction of travel of the car is downwards with

Standard	DCP
24V signal on input configured to "RV2"	Command byte 1, Bit 4 has 1-signal

Detection of voltage drop
Configure digital input in the **Control system** menu to **PARA2**.

```
Control system
↳f_I08   PARA2
  ↳      PARA2
Funktion of I_08
```

In case of a voltage drop (power failure) the inverter is informed by activating the congured input with 24VDC that a switchover must be made to parameterset 2.

(3) Inform the open loop control about the permissible direction of travel (optional):

Standard	DCP

Configure digital output in the **Control system** menu to **Evac. Dir.**
 	
`Control system`
`↳f_O4  Evac.Dir`
`  ↳  Evac.Dir`
`Funktion of O4`
 	
Contact open ⇦ Car is lighter than counterweight
Evacuation trip will be carried out upwards!
 	
Output closed ⇦ Car is heavier than counterweight
Evacuation trip will be carried out downwards!
	Status byte 2, Bit 2 = 0 ⇦ Car is lighter than counterweight
	Evacuation trip will be carried out upwards!
	
	Status byte 2, Bit 2 = 1 ⇦ Car is heavier than counterweight
	Evacuation trip will be carried out downwards!

(4) Evacuation type default
Configure the parameter **F_PARA2 = EVA. 1*AC** in the **Parameter set 2** menu.

```
Paramter set 2
↳F_PARA  EVAC1*AC
  ↳      EVAC1*AC
Function parameter set 2
```

(5) Copying the parameters:
In the menu **Parameter set 2 / COPY**, select the function **PARA->2**. After copying, the parameter is once again OFF.

```
Parameter set 2
↳COPY    OFF
  ↳      Para1⇦2
Copy parameter
```

Information
The power failure detection and type of evacuation must be parameterised before copying the parameters. Only a lower speed of the motor is possible because of the lower mains supply. The maximum possible speeds for V_2 and V_3 are calculated during the copying process.

12.2 Evacuation with UPS

Information
The methods of Emergency Evacuation, described in this chapter, are only possible with the types ZETADYN 3BF011 - ZETADYN 3BF074.

Due to the low power requirements of a synchronous drive, it is possible to carry out an evacuation trip 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!

Due to the high level of magnetization current, emergency evacuation with a single-phase mains supply with asynchronous motors does not make sense.

In case of a mains failure, the UPS supplies the following voltage:

- 230 VAC to feed L1 and L2

During each trip, the frequency inverter analyses the load ratio between the car and the counter-weight. In case of a voltage drop (mains failure), the frequency inverter informs the control system which direction is possible for an evacuation trip. The open loop control carries out the evacuation trip in the corresponding direction.

The control system starts the evacuation trip by activating:

- Controller enable
- Direction preset (in the direction of the pulling load)
- Speed default

12.2.1 Evacuation through UPS with optimum power

Characteristics of evacuation with optimum UPS power:

- Load-independent starts
- Load-independent stopping
- Flush stopping
- With corresponding sizing of the UPS, a trip in the motoric direction is also feasible.

Calculation of the UPS

	The required UPS performance consists of the following:
	Electronic frequency inverter power consumption
+	Control systempower consumption
+	Electromechanical brakes power consumption
+	Other consumers (car light, …) power consumption
+	Motor power consumption for UPS operation with sufficient power (ask motor manufacturer)
=	**Real power UPS [W]**

Information
The shaft efficiency has a decisive influence on the required power of the UPS performance.

12.2.2 Evacuation through UPS with minimum power

Evacuation through UPS with minimum power

- Load-dependent starting, cannot be optimized
- Evacuation only possible in the direction of the pulling load
- Positioning is carried out load dependent; that means step formation could occur.

Calculation of the UPS

The required UPS performance consists of the following:

Electronic frequency inverter power consumption
\+ Control systempower consumption
\+ Electromechanical brakes power consumption
\+ Other consumers (car light, …) power consumption
\+ Motor power consumption for UPS operation with reduced power (ask motor manufacturer)
= **Real power UPS [W]**

Information
The shaft efficiency has a decisive influence on the required power of the UPS performance.

12.2.3 Parameterisation

(1) The following prerequisites must be present:
The direction of travel of the car is downwards with

Standard	DCP
24V signal on input configured to "RV2"	Command byte 1, Bit 4 has 1-signal

Detection of voltage drop
Configure digital input in the **Control system** menu to **PARA2**.

```
Control system
↳ f_I08   PARA2
  ↳       PARA2
Funktion of I_08
```

In case of a voltage drop (power failure) the inverter is informed by activating the congured input with 24VDC that a switchover must be made to parameterset 2.

(3) Inform the open loop control about the permissible direction of travel (optional):

Standard	DCP

Configure digital output in the **Control system** menu to **Evac. Dir.**
`Control system`
`↳ f_O4  Evac.Dir`
`  ↳  Evac.Dir`
`Funktion of O4`
Contact open ⇦ Car is lighter than counterweight
Evacuation trip will be carried out upwards!
 	
Output closed ⇦ Car is heavier than counterweight
Evacuation trip will be carried out downwards!
	Status byte 2, Bit 2 = 0 ⇦ Car is lighter than counterweight
	Evacuation trip will be carried out upwards!
	
	Status byte 2, Bit 2 = 1 ⇦ Car is heavier than counterweight
	Evacuation trip will be carried out downwards!

(4) Evacuation type default
Configure the parameter **F_PARA2 = UPS** in the **Parameter set 2** menu.

```
Parameter set 2
↳ F_PARA2 UPS
  ↳       UPS
Function of parameter
```

(5) Presetting the stator resistor in synchronous motors
Configure the synchronous motor's stator resistor in the **Parameter set 2/RS_UPS** menu

```
Parameter set 2
↳ RS_UPS  1.00       Ohm
  ↳       1.00
Stator-resistor (UPS
```

(6) Limit motor current
Limit the motor current by entering the available UPS power in the **"Parameter set 2 / P_UPS"** menu.

```
Parameter set 2
↳ P_UPS   1.0          kW
  ↳       1.0
Max. Load UPS
```

Calculating the available UPS power:

UPS power $_{\text{name plate}}$
- Control systempower consumption
- Electromechanical brakes power consumption
- Other consumers (car light, …) power consumption

= **Available UPS_power [W]**

Information
Entering the UPS power determines the type of UPS evacuation.
Sufficient power: An evacuation trip with the characteristics of an evacuation with optimum UPS power is implemented.

Not enough power: An evacuation trip with the characteristics of an evacuation with minimal UPS power is implemented.

CAUTION!

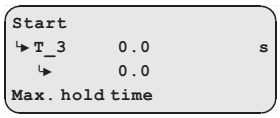
Caution!
Setting the value for P_UPS too high can lead to an overloading or destruction of the UPS.

(7) Copying the parameters
In the menu **Parameter set 2 / COPY**, select the function **PARA->2**. After copying, the parameter is once again OFF.

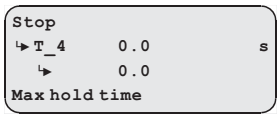
```
Parameter set 2
↳ COPY    OFF
  ↳       Para1 2
Copy parameter
```

Information
The power failure detection and type of evacuation must be parameterised before copying the parameters. Only a lower speed of the motor is possible because of the lower mains supply. The maximum possible speeds for V_2 and V_3 are calculated during the copying process.

(8) Switch off times in which the motor is kept at speed 0:
Configure in the **Start / T_3 = 0** menu



Configure in the **Stop / T_4 = 0** menu



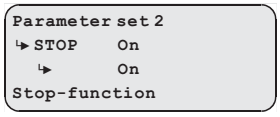
12.3 Improving the positioning

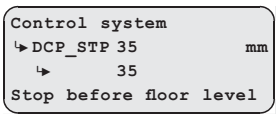
Information
The methods of Emergency Evacuation, described in this chapter, are only possible with the types ZETADYN 3BF011 - ZETADYN 3BF074.

Due to the reduced UPS power, it is not possible to decelerate the motor until standstill. That means, at the time when the floor is reached and the brakes are closed, the motor is still moving. The time delay until the brakes are closed can lead to overshooting the door zone area and thus step formation.

12.3.1 Parameterisation

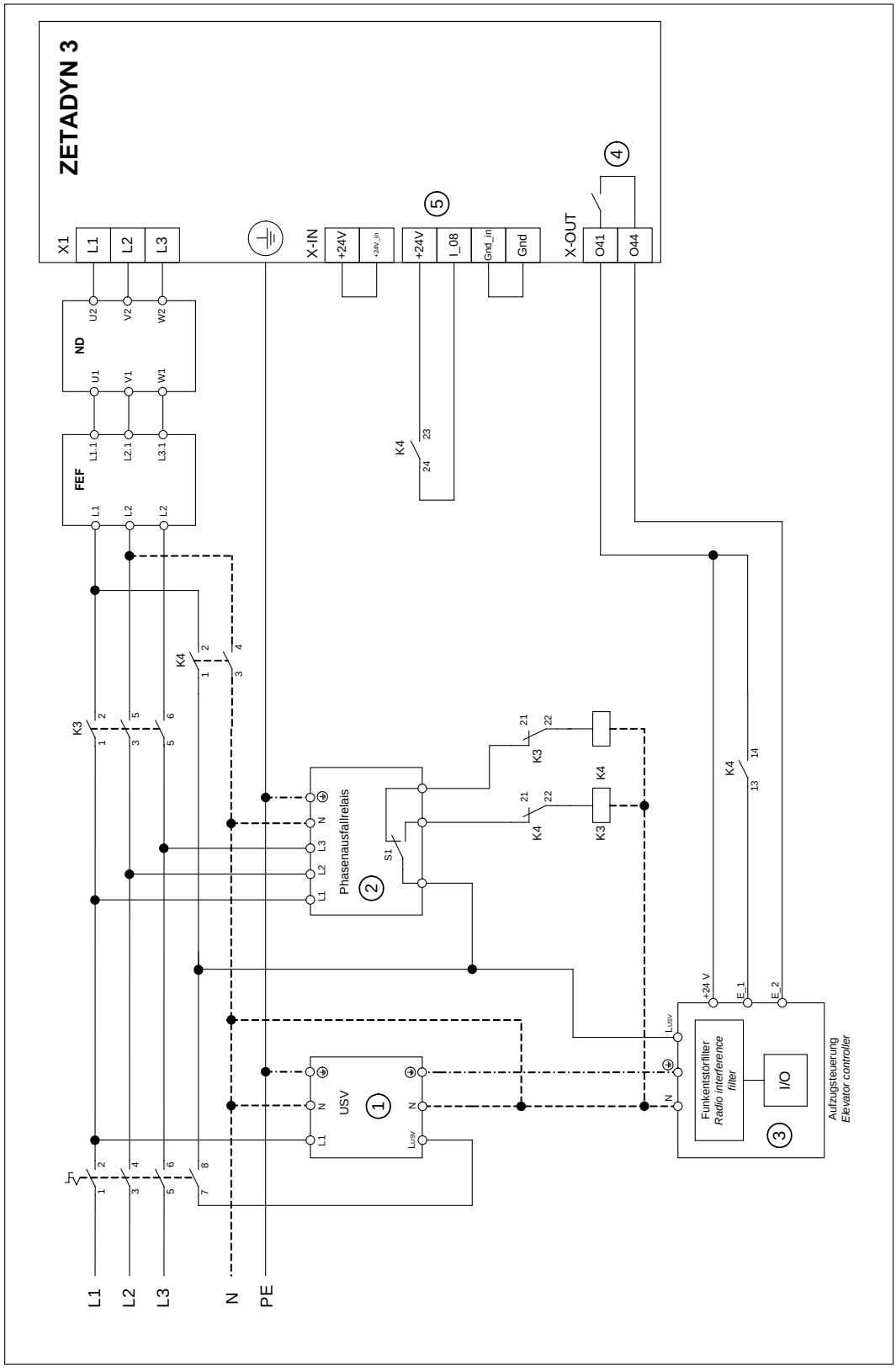
Configure in the **Parameter set 2 / STOP = ON** menu



Standard	DCP2 / DCP4
Configure in the "Parameter set 2 / STOP = ON" menu Brake is already closed when the switch off for the speed V_1is reached.	Determine overshoot path at the flush position under full load Menu **Control system / DCP_STP = ... mm** parametrieren  The brakes are already closed when the distance to the flush position preset by S_Stop is reached.

Information
Despite these measures, positioning is still load-dependent. During trips with half-load, stopping too early outside the door zone area can occur under **Parameter set 2 / STOP = ON**.

12.4 Connection diagram for UPS to ZETADYN 3



1 Uninterruptible power supply
2 Phase failure relay
3 elevator control system
4 Output paramterised to "Evac.Dir" function (information direction of generator)
5 Input parameterised for "PARA2" function
S1 Relay is active when all 3 phases of the power supply are connected.
E_1 Information voltage failure
E_2 Information direction of generator (can be omitted when extended status bytes evaluated at DCP3 and DCP4)
K3 Normal operation
K4 Operation with uninterruptible power supply

12.5 Emergency evacuation by opening the brakes

Information

The methods of Emergency Evacuation, described in this chapter, are only possible with the types ZETADYN 3BF011 - ZETADYN 3BF074.

Emergency evacuation through manually or electrically opening the motor brakes until the cabin has reached the next floor in the direction of the pulling load.

Warning

S

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

CAUTION!

Caution!

Short-circuiting the motor windings must be authorized by the motor manufacturer. This is tested and guaranteed in Ziehl-Abegg motors.

12.5.1 Monitor function

Monitoring of evacuation direction and evacuation speed during the evacuation process.
The monitoring function will be activated by a digital input.

```
Control system
↳f_I08   41:Monitor
  ↳      41:Monitor
Function of I08
```

Configure the digital input in the **Control system** menu to the function **41:Monitor**.

Activating of the monitoring function

- Switch off the frequency inverter
- activate the digital input with the "Monitoring" function
- Switch on the frequency inverter
- Monitoring function is active

Elevator-Monitor Speed: 0,2 m/s Direction: up ▲ Distance: +1.24 m	**Elevator-Monitor** **Speed:** Display of the actual evacuation speed **Direction:** Display of the actual evacuation direction ▲ Evacuation speed < Limit V_G1 ▲▲ Evacuation speed > Limit V_G1 **Distance:** Display of the evacuation distance past

Information

During activated Monitoring-Function, all further functions of the frequency inverter are locked!

13 Error diagnosis

13.1 Travel abort and acknowledgement during malfunctions

13.1.1 Travel abort

If the frequency inverter detects an error, the current trip program is aborted and the outputs:

- ST – Malfunction
- RB – Controller ready (motor contactors)
- MB – mechanical brake

The open loop control must immediately:

- Close the electromechanical brake
- Open the motor contactors

The machine is decelerated by the brake torque of the mechanical brake.

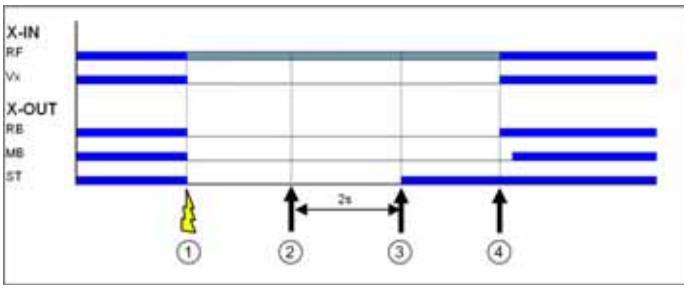
The error that has occurred is shown in the display with error text and error number. LED's, error memory and an error list are available for additional troubleshooting.

13.1.2 Acknowledgement

Acknowledging the error is performed automatically 2 seconds after the cause of the error has been repaired.
The prerequisite is that the input signals for traveling speeds are applied. No error acknowledgement is issued f traveling signals are applied before the expiration of the 2 seconds.

The following errors are not automatically acknowledged:

Error no.	Acknowledgement by
900 ... 999	Switch frequency inverter off and then back on



1 Error is recognized
2 Error is no more present
3 Atomatic acknowledgement with Vx=0
4 New travel command

13.2 Light emitting diodes

Condition of the frequency inverter

Four LEDs are available to diagnose the frequency inverter.

Error (red)	Update (yellow)	Op1 (gelb)	Op2 (grün)	Operation condition
Off	Off	Slow alternating flashing		Standstill
Off	Off	Fast, alternating flashing		Travelling

Condition of the CAN- DCP connection

Two LEDs are available to diagnose the CAN / DCP connection.

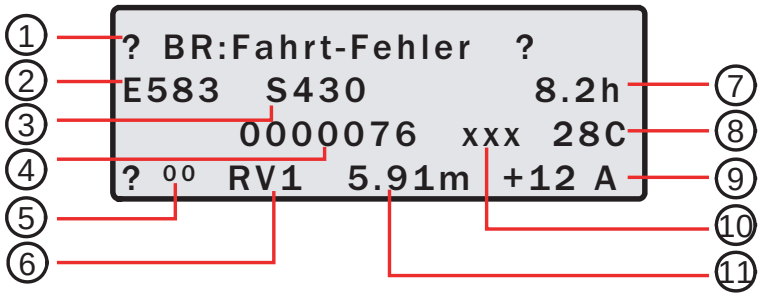
Error (red)	Run (green)	Operation condition
On	On	CAN/DCP interface module is present, but the DCP function was not activated
fast flashing	Off	With activated DCP function, the DCP connection is not present or is defective
Off	On	With activated DCP function, the DCP connection is flawless
Slow alternating flashing		The DCP function is not activated in a trouble-free DCP connection (only DCP3/DCP4)

13.2.1 Software-Update

If an error occurs during the software update, a flash code is issued by LED OP1 for the corresponding error message.
An explanation of the flash code can be found in the chapter Special Functions/Software Update

13.3 Readout the error memory

Faults which lead to interruption of the travel are saved in a fault list.
The fault list can be found in menu **Statistik/ST_LST**. Up to 64 error messages can be managed. Once the number of 64 messages has been reached, the oldest entry in each case is deleted for each new error message which arises. When the fault list is called up, the last fault which occurred is displayed with the following information:



1 Error description
2 Error no.
3 Operation condition (S=status)
4 Travel number
5 Consecutive error number
6 Travel direction
7 Operating hours
8 Temperture power stage
9 Motor current consumption
10 Additional information (option)
11 Position of tha car in the shaft

Please refer to the "Error diagnosis“ chapter for a description of the error number and the operating condition.

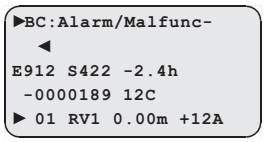
Scroll through fault list:
the fault list can be scrolled through using the two arrow keys.


Scroll up (reduce fault serial number)


Scroll down (increase fault serial number)

Determine time of fault


When i key is pressed, the difference from the current number of travels and operting time is displayed



13.4 Delete error memory

The fault memory is wiped by means of an entry in the **Statistic/ST_CLR=ON**.
The following parameters are reset:

- ST_LST (Error list)
- ST_RES (Number of interruptions in the mains supply)
- ST_SRF (Number of trip interruptions due to an interruption in the control enabling)
- ST_SCO (Number of trip interruptions due to an interruption in the contactor monitor)

13.5 Error list

All error messages are stored in the **Statistic/ST_LST** menu (see "Error diagnosis / error memory" chapter)

13.5.1 Masc-Funktion

You can deactivate individual monitoring functions by inputting an item in the error mask (see "Parameter list /"Monitoring" menu chapter). To do this, enter the corresponding error number into error masks 1-5.
The maskable errors are marked in the error list with a **point** in thecolum n **M**.

CAUTION!

Caution!

Never use the mask function during trouble shooting and error diagnosis. You must acknowledge the cause of the error for permanent inverter operation!

Sequential errors can occur if errors are masked.

Important monitoring functions are deactivated through masking. That can result in hazardous service conditions or damage to the inverter.

13.5.2 Block function

The block function blocks the controller if certain errors recur several times successively, depending on the configuration in the "Monitoring/MODE_ST" menu (see "Parameter list / "Monitoring" menu chapter). During this, the error must occur in directly successive trip trials. When a flawless trip is carried out, the error counter is reset to 0.
The following block functions can be set in the **Monitoring/MOD_ST** menu:

- Fix 2 Sec.: No blocking function, the output configured on "ST" drops for 2 seconds during a malfunction and then increases again (speed preset V_x must be switched off)
- Lock n.3: Lock function after 3 malfunctions. Output "ST" remains dropped after the 3rd error
- Lock n.2: Block function after 2 malfunctions. Output "ST" remains dropped after the 2nd error
- Lock n.1: Lock function after 1 malfunction1. Output "ST" remains dropped after the 1st error

Errors that lead to a blocking of the frequency inverter are marked with a **point** in column **S**.

13.5.3 Notes 0xx

Information about:

- Error memory content
- Changes in the operating conditions
- Application of special inverter functions

Note-No.	Note text	Description	M	S
N0	Memory empty	EEPROM is empty		
N010	Update software	Software update was carried out **Additional information:** Version of the new software		
N020	MOT_TYP changed	Motor type in "Motor name plate" was changed		
N077	ST_LST: locked	Five faults occurred in direct succession Fault memory is blocked **Additional information:** indicates the most recent fault The fault counter is set to 0 when performing a trouble-free run.	•	
N080	Mode: EVA ->Norm	Switchover from evacuation to normal mode was implemented		
N081	Mode: Norm ->EVA	Switchover from normal to evacuation to mode was implemented		
N082	Mode:ParaChange	The parameter set was changed	•	
N085	Mode: Safety Br	Safety brake function was implemented		•
N086	Mode:Enc.Adj.MB	Encoder-alignment with closed brakes was carried out		
N087	Mode:Encoder-Adj.	Manual encoder offset was carried out		
N088	Mode:Encoder-Check	The encoder offset alignment was checked		

13.5.4 Error 1xx

- Hardware configuration error
- Software error

Error no.	Error text	Error cause	M	S
100	Serial no. missing	Inverter / CU does not have a serial number, e.g. after a component replacement		•
101	System-Error	An internal, defective component was found during a self-test of the inverter		•
110 120	CU: No ID	CU ID no. was not detected: CU is not present or its ID EEPROM does not reply		•
111	CUSH: No ID	Shunt ID no. was not detected: Shunt module is not present or its ID EEPROM does not reply		•
113 123	CUEE: No ID	ID no. for the additional card for the the encoder was not detected: encoder card is not present or its ID EEPROM does not reply	•	
115 125	SP: No ID	Switching power supply ID no. was not detected: Switching power supply is not present or its ID EEPROM does not reply		•
116 126	PP: No ID	Power print ID no. was not detected: Power print is not present or its ID EEPROM does not reply		•

Error no.	Error text	Error cause	M	S
117 127	MP: No ID	The print module ID no. was not detected: Module Print is not present or its ID EEPROM does not reply		●
121	CUSH: ID-Error	Internal shunt module was detected but there are problems with the shunt module's informational content		●
140	MP:Unknown IGBT	A unknown IGBT-module was recognized		
141	MP: Temp.Sens?	The external temperature sensor for the Modul Print is not recognized	●	
150	HW-Conflict !	Shuntmodul, Power Print and Modul Prind do not match		
155	No Analog-Input!	Frequency converter type ZETADYN 3-HY is not equipped with an analogue input (X-AN)	●	
174	CUMT:Not detect	Option module for the temperature monitoring of the motor is nit recognized: Check the configuration for rhe temperature monitoring in the "Monitoring" menu		●
180	UF CTRL=DCP2/4	**Error:** DCP2 or DCP4 is entered for the communication between inverter and elevator contol. This is not possible with Open-Loop-operation **Remedy:** Enter DCP1 or DCP3 for the communication	●	

13.5.5 Error 2xx

- Configuration error

Error no.	Error text	Error cause	M	S
200	Stop input	**Error:** A parameter is open while apply a correct travel command (RF + RVx + Vx) **Remedy:** End parameter inputs	●	
201	Motor name plate	**Error:** a parameter in the "Motor name plate" menu has not been assigned **Remedy:** Check the parameter in the "Motor name plate" menu		
202	MOT_TYP = ?	**Error:** No motor type was selected in the "Motor name plate" menu **Remedy:** Enter in the "Motor name plate"menu		●
203	n* = 0?	**Error:** No speed was entered in the "Installation" menu **Remedy:** Enter the speed at V* in the "Installation" menu directly or have it calculated based on the installation data		●
204	n* > 3*n	**Error:** n* was incorrectly calculated due to incorrect installation data (n* >3xn) **Remedy:** Check the installation data for correct entry	●	
205	Input duplicated	**Error:** two digital inputs are assigned with the same function **Remedy:** Change the function allocation of the digital inputs		●
207	Input PFU_BR miss.	**Fault:**When using a feedback unit in connection with a brake resistor the temperature monitor of the brake resistor is not programmed **Remedy:** Parameterise digital input (preferably X_BR4) in the "Control" menu to the "PFU_BR" function	●	
208	DELAY active	**Error:** Emergency stop was done by deactivating of the input with the function "/DELAY" At travel start, the input with the function "/DELAY" is not active **Remedy:** Check the triggering of the input with the function "/DELAY"		
210	Wrong ENC_TYP	**Error:** Encoder type and motor type do not match **Remedy:** Enter the correct encoder type in the "Encoder & BC"menu	●	●
211	No binary encoder	**Error:** With theb encoder types TTL-sine wave or EnDat/SSi no binary resolution was enterd **Remedy:** Enter a binary resolution (e.g. 512, 1024 or 2048)		
220	Error: SM data	**Error:** While operating synchronous motors, the values for the rated speed (n) and the rated frequency (f) do not match in the "Motor name plate" menu **Remedy:** Enter the correct data for rated speed and rated frequency in the "Motor name plate" menu	●	●
221	Error: ASM data	**Error:** While operating asynchronous motors, the values for the rated speed (n) and the rated frequency (f) do not match in the "Motor name plate" menu **Remedy:** Enter the correct data for rated speed and rated frequency in the "Motor name plate" menu	●	●

Error no.	Error text	Error cause	M	S
231	V_G1 > 150% V*	**Error:** the limit value configured for V_G1 is too large **Remedy:** Configure the limit value V_G1 to max 150% V* in the "Control system" menu		
232	V_G2 > 150% V*	**Error:** the limit value configured for V_G2 is too large **Remedy:** Configure the limit value V_G2 to max 150% V* in the "Control system" menu		
233	V_G3 > 150% V*	**Error:** the limit value configured for V_G3 is too large **Remedy:** Configure the limit value V_G3 to max 150% V* in the "Control system" menu		
280	S31 too long	**Error:** the calculated deceleration path S31 is too long **Remedy:** in the "Decelerate" menu, increase the deceleration "A_NEG" or reduce the round offs "R_NEG1" and "R_NEG2		●
285	Installation:V*=0	**Error:** V* in the "Installation data" menu has not been assigned **Remedy:** Check the parameter in the "Installation" menu		
287	V1 . . . V7 > V*!	**Error:** One of the travelling speeds V_1 ... V_7 entered is larger than the entered rated speed V* **Remedy:** Configure speeds V_1 … V_7 in the "Travel" menu to ≤ V*		
288	V_3 > V*	**Error:** The traveling speed V_3 entered is larger than the entered rated speed V* **Remedy:** Set speed "V_3" in the "Travel" menu to ≤ V	●	●
289	V_1 < V_2 < V_3!	**Error:** Speeds in the "Travellingl" menu are incorrectly set **Remedy:** In the "Travel" menu, make sure that V_1 < V_2 and V_2 <V_3	●	●
290	ParaSet2 empty!	**Error:** Activated parameter set 2 does not contain any data **Remedy:** In the "Parameter set2" menu, copy the the data from parameter set 1 to parameter set 2		●

13.5.6 Error 3xx

- Error before trip start

Error no.	Error text	Error cause	M	S
301	MOP: Timeout	**Error:** No communication between the application processor and the motor management processor during start due to an error during the update **Remedy:**Carry out a software update	●	●
303	MOP: SW-Error	**Error:** Software error message in the motor management processor **Remedy:**Carry out a software update	●	●
304	MOP: HW-Error	**Error:** Hardware error message in the motor management processor	●	●
305 306	ADC calibration??	**Error:** Zero point offset in the motor current detection (analogue digital converter) is outside the tolerance **Remedy:** Replace defective shunt module		●
307	Iu Iv Iw > 1.0A	**Error:** Defective current measuring the phase U, V or W **Remendy:** Check the connector of the Shunt-Modul Current sensors are defekt	●	●
310	No abs.enc	**Error:** The connected absolute encoder is not detected (when switching on the inverter no the absolute encoder was not connected) **Remedy:** Check encoder connection Switch frequency inverter off and then back on Check the parameter in the "Encoder & BC" menu		●
315	EnDat: HW-error	**Error:** EnDat encoder delivers error		●
316	EnDat: Resolution	**Error:** Configured resolution in the EnDat encoder does not match the encoder resolution **Remedy:** Enter the correct encoder resolution in the "Encoder & BC" menu		●
320	ENC: Error-start	**Error:** Configured sinusoidal encoder was not detected **Remedy:** Check connection Check the encoder type; possibly connect a square wave encoder	●	●

Error no.	Error text	Error cause	M	S
321	EnDat: ULP-error	**Error:** While starting, an error was read out from the EnDat encoder. Error is stated as a code: 0: defective encoder power supply 1: no SSI communication 2: Encoder illumination defective 3: defective signal amplitude 4: Positioning error 5: defective sine evaluation **Remedy:** Check the connection, Check the encoder		
322	EnDat: Com-Fehler	**Error:** During start, malfunction in communication to EnDat encoder; absolute value could not be read out **Remedy:** Check the encoder, Check encoder cable Check the encoder configuration in the "Encoder & BC" menu		
324	SSI: Ack-Error	**Error:** During start, malfunction in communication to SSI encoder; absolute value could not be read out **Remedy:** Check the encoder, Check encoder cable Check the encoder configuration in the "Encoder & BC" menu		
325	SSI: Timeout	**Error:** During start, malfunction in communication to SSI encoder; absolute value could not be read out, encoder does not reply **Remedy:** Check the encoder, Check encoder cable Check the encoder configuration in the "Encoder & BC" menu		
327	ENC: Read-Error	**Error:** During reading out the position of the absolute encoder (position will be read out repeatedly) different values will be read. **Remedy:** Check the encoder, Check encoder cable Check encoder connection (e.g. shielding)		
328	ENC: Count-Dif	**Error:** Too large a difference between the position determined by the absolute rotary encoder and the position calculated from the encoder pulses **Remedy:** Check the encoder, Check encoder cable Check encoder connection (e.g. shielding)		
329	ENC:Sinus-Error S	**Fault:** Plausibility between sine and cosine track of sinus encoder unsatisfactory **Remedy:** Check the encoder, Check encoder cable Check encoder connection (e.g. shielding)		
330	ENC:Sinus-Error F	**Fault:** Plausibility between sine and cosine track of sinus encoder unsatisfactory Number of checks can be set in the menu "S9_ZA-Intern/ENC_C HK". The factory setting ENC_CHK=4 corresponds to a check duration of approx. 1 ms. **Remedy:** Check the encoder, Check encoder cable Check encoder connection (e.g. shielding)		
331	ENC: Error NDEF	**Error:** Start-Bit of the EnDat-protocol is not detected **Remedy:** Check the encoder, Check encoder cable Check encoder connection (e.g. shielding)		
332	ENC: 1387 CD=0	**Fault:** input voltages of signal tracks C and D of absolute value encoder type ERN1387 areboth zero **Remedy:** Check the encoder, Check encoder cable Check the encoder connection		
372	ENC:No Abs.value	**Error:** Before start of trip, no absolute value read in from encoder **Remedy:** Check encoder connection		•
373	ENC:No Abs.End	**Error:** Before start of trip, no absolute value read in from encoder **Remedy:** Check encoder connection		•

Error no.	Error text	Error cause	M	S
374	P1P2:short-circuit	**Fault:**with parameterised motor temperature monitor "P1P2=PTC" the resistance at the input P1P2 is < 20 ohms **Remedy:** Check connected motor temperature monitor Check parameterised sensor type in "Monitoring/P1P2" menu Short-circuit at the X-MT:P1P2 is not permissible	●	
375	MOT:Temp.warning	**Fault:** motor temperature monitoring has responded at a standstill **Remedy:** Check the temperature sensor connection remove the cause for the rise in the motor temperature	●	●
377	BRxx:Temp.warning	**Error:** The continious braking power of the Brake resistor is exceeded by 150 % within 120 s A restart will be avoided **Remedy:** Check the configuration of the BR-type Check the connected BR	●	●
378	MP: Not active!	**Fault:** Mains supply of the power section not active		●
379	MP:Temp.warning	**Error:** during startup, the temperature on the power stage is too high **Remedy:** Inverter is overloaded, repair the cause for the overload	●	●
380	BR: Start-Error	**Error:** When the brake monitoring is activated, at least 1 brake monitoring contact is not connected or is incorrectly connected **Remedy:** Check the functioning (NO or NC) in the monitoring contacts, check the configured number and function of the monitoring contacts in the "Monitoring" menu, check the connection of the monitoring contacts		●
385	DCP: Init fail	**Error:** Inverter has not received any initialization data from the open loop control (in DCP03 & DCP04) **Remedy:** Check the DCP line connection, Check the type of triggering control in the "Control system" menu Check the elevator control system		●
395	MP:ERR_EXT active	**Error:** Internal defect of the device, overcurrent in the power stage	●	●

13.5.7 Error 4xx

- Trip abort to protect the frequency inverter
- Voltage monitoring
- Overvoltage Brake resistor / Brake-Chopper
- Power stage temperature recording
- Current monitoring

Error no.	Error text	Error cause	M	S
410	ADC: Over current!	**Error:** Maximum modulation of the analogue current converter, motor current too high **Remedy:** Check the connection to inverter output for short-circuit, check encoder connection for connection of encoder tracks, check the phase position (U↖U; V↖V; W↖W), Check motor data in the "Motor name plate" menu, Decrease "SPD_KP" amplification in the "Control system" menu, Reduce amplification during start "K_START" in the "Start" menu		●
412	MOT:UVW fail	**Error:** Motor test current not correct **Remedy:** Check the motor connection Check the motor contactors (see also "Special functions" chapter)	●	
415	MOT: Current UVW	**Error:** Motor fault current, earth fault **Remedy:** Check the motor connection Check the encoder connection	●	●

Error no.	Error text	Error cause	M	S
420	MP: Temp. Fault	**Error:** Excess heat in the power stage **Remedy:** Check the fan, check the ambient temperature, when installing the inverter in the switch cabinet, ensure it has sufficient ventilation	●	●
431	MP: PWM fail	**Error:** The pulse width modulation of the clock frequency is not switched on or off **Remedy:** Check encoder connection	●	●
450	MP: Overload!	**Error:** nominal current of inverter exceeded by a factor of 1.8 for 10 s **Remedy:** Check motor data Check calculation Check the weight compensation	●	
460	HY_OVERLOAD	only at ZETADYN 3-HY **Fault:** Maximum level of the internal current controllers **Remedy:** Check motor data Check encoder type Check the encoder connection Check encoder resolution Reduce machine speed Check machine for overload **Info:** inverted Function	●	
470	DC: U < UDC_MIN	**Error:** Intermediate circuit has undercut the permissible value for "UDC_MIN" (Menu "Power section") during travel **Remedy:** Check the setting for the "UDC_MIN! value in the "Power section" menu, check the inverter size, Check the motor data Voltage drop during the travel Check the input phases	●	●
471	DC: U > UDC_MAX	**Error:** Intermediate circuit has exceeded the permissible value for "UDC_MAX" (Menu "Power section") during trave **Remedy:** Check the setting for the "UDC_MAX! value in the "Power section" menu, Check the connection / functioning of the brake chopper / brake resistor Check the parameter in the "Encoder & BC" menu Check the size of the Brake-Chopper / Brake-Resistor,	●	●
475	DC: U > 850V	**Error:** During travel, the intermediate circuit voltage exceeds 850VDC **Remedy:** Check the connection / functioning of the brake chopper / brake resistor, Check the size of the Brake-Chopper / Brake-Resistor, Check selection of brake chopper / brake resistor in chapter "Encoder & BC/BC_Type"		●
480	MP: Overcurrent!	**Error:** In one motor phase, overcurrent was measured **Remedy:** Check the motor connection (short-circuit, earth fault), Check the encoder connection Check the "SPD_KP" parameter in the "Control system" menu,		●
481	MP: Overcurr. CO	**Error:** in at least 1 open motor contactor monitoring-contact (contactor monitor on X-CO not triggered), overcurrent was measured in one motor phase **Remedy:** Check the contactor monitoring Check the contactor wiring		●
490	MP: UCE -Alarm	**Error:**The IGBT monitoring was activated due to high motor current **Remedy:** Check the motor connection (short-circuit, earth fault), Check the encoder connection Check the "SPD_KP" parameter in the "Control system" menu,		●
491	MP: UCE -Alarm CO	**Error:** in at least 1 open motor contactor monitoring-contact (contactor monitor on X-CO not triggered), the IGBT monitoring was activated due to high motor current **Remedy:** Check the contactor monitoring Check the contactor wiring		●

Error no.	Error text	Error cause	M	S
497				
499				

13.5.8 Error 5xx

- Trip abort to protect the installation
- Speed monitoring
- Contactor control
- Monitoring of Brake resistor / Brake-Chopper
- Motor temperature monitoring

Error no.	Error text	Error cause	M	S
501	Travel at MB=OFF	**Error:** Machine moves with deactivated MB output occurs if the brake is opened manually occurs if the brake is opened manually, **Remedy:** Check the brake functioning	●	●
502	ENC:Sin-Enc.fail	**Error:** In standstill, a sine signal from the encoder was detected **Additional information:**The maximum output voltage of the inverter was reached at the time of the error **Remedy:** Check the brake functioning Check the encoder connection	●	●
503	No starting	**Error:** No encoder signal was received after expiration of the time T_GUE (T_GUE is started with T_2) **Remedy:** Check the function of the encoder, Check the encoder connection Check the brake lifting Check the time "T_ENC" in the "Monitoring" menu Check the times "T_2" and T_3" in the "Start" menu	●	●
505	MB/ENC fault	**Error:** At target speed of >10cm/s, inverter does not receive an encoder signal **Additional information:** Motor current in ampere **Remedy:** check motor connections (U↔U; V↔V; W↔W), Brake not closed during start, Check the motor data Check the encoder connection Increase the "SPD_KP" parameter in the "Control system" menu,	●	●
506	X_ENC15:Discon.	**Error:** Interruption of the encoder signal during travel **Remedy:** Check encoder connection Switch frequency inverter off and then back on		
515	v > 110% V*	**Error:** Actual speed is ≥ 110% of the nominal speed V* **Remedy:** Check whether the car counterweight is pulling up, Check motor data in the "Motor name plate" menu, Check the resolution type in the "Encoder & BC" menu, Check the "SPD_KP" parameter in the "Control system" menu,	●	●
516	v > 150% V*	**Error:** Actual speed is ≥ 150% of the nominal speed V* **Remedy:** Check whether the car counterweight is pulling up, Check motor data in the "Motor name plate" menu, Check the resolution type in the "Encoder & BC" menu, Check the "SPD_KP" parameter in the "Control system" menu,	●	●
518 519	Speed too low	**Error:** The actual speed deviates from the target speed by -15% **Remedy:** Check encoder connection check the encoder pulse in the "Info" menu, page 11 Check the brake lifting Check motor data in the "Motor name plate" menu, Check the resolution type in the "Encoder & BC" menu, Increase "SPD_KP" amplification in the "Controller" menu	●	●

Error no.	Error text	Error cause	M	S
520	Wrong direction	**Error:** Machine moves more than 12 cm in the wrong direction **Remedy:** Check encoder connection Check the encoder configuration in the "Encoder & BC" menu check the motor connections (U⇔U; V⇔V; W⇔W) Inverter size too small	●	●
522	ENC: Dif. Pos	**Error:** Too large positive difference in the encoder counter level between two scan steps. The limit value equals 2 times the installation rated speed **Remedy:** Check whether the car counterweight is pulling up, Check motor data in the "Motor name plate" menu, Check the resolution type in the "Encoder & BC" menu, Check the "SPD_KP" parameter in the "Control system" menu, Check the motor connection	●	●
523	ENC: Dif. neg	**Error:** Too large negative difference in the encoder counter level between two scan steps. The limit value equals 2 times the installation rated speed **Remedy:** Check whether the car counterweight is pulling up, Check motor data in the "Motor name plate" menu, Check the resolution type in the "Encoder & BC" menu, Check the "SPD_KP" parameter in the "Control system" menu, Check the motor connection	●	●
525	ENC: 1387 ADC Limit	**Fault:**signal track A or B of the absolute value or sinus encoder exceeding permitted limit value during travel Fault entry not made until end of travel Travel not cancelled **Remedy:** Check the encoder, Check the optional pcb for encoder connection Check the encoder type in the "Encoder & BC" menu,	●	●
529	Quickstart alarm	**Error:** During a quick start function, the machine moves more than 7mm while input "V=0" is triggered **Remedy:** Check the parameter in the "Motor name plate" menu Shorten time during which input "V=0" is triggered check the motor connections (U⇔U; V⇔V; W⇔W)	●	●
540	CO: ON!?	**Fault:** No signal is available at the end of the contactor monitoring time T_CDLY **Remedy:** Check the wiring of the contactor monitoring, check wiring the contactor control, check the power supply of the motor contactors , Check the power-supply of the contactor monitoring Check contactor switch-on time "T_CDLY " in the "Monitoring" menu Check the contactor monitoring in the "Monitoring" menu		●
544	CO/RF:Vx activ!	**Error:** 300 ms after switching off the digital outputs RB and MB due to a RF- or CO-interrupt, the travel comands of the elevator control are still activated **Remedy:** Check the analysis of the output signals from the inverter by the elevator control	●	
545	CO open early	**Error:** Motor contactors are open during travel **Remedy:** Check the motor contactor triggering Check the safety circuit	●	
546	CO: open early M	**Error:** Motor contactors are open during travel **Remedy:** Check the motor contactor triggering Check the safety circuit	●	
548	CO1: still on	**Error:** 5s after expiration of T_CDLY, a signal is still present on the contactor monitor input CO1 **Remedy:** Check the wiring of the contactor monitoring, check wiring the contactor control,		●
549	CO12: still on	**Error:** 5s after expiration of T_CDLY, a signal is still present on the contactor monitor input CO1 or CO2 **Remedy:** Check the wiring of the contactor monitoring, check wiring the contactor control,		●

Error no.	Error text	Error cause	M	S
550	MOT: Overload !	**Error:** Motor current exceeds the value max for time Tmax **Remedy:** Check the parameter in the "Motor name plate" menu Check the weight compensation Check the brake switching function	●	●
560	V > VZ	**Error:** Actual speed exceeds the specified nominal speed for readjustment when readjusting. **Info:** inverted Function Error is displayed if entered in mask At **CONFIG: 31:KL_IO** the function is entered in the mask automatically.	●	
575	MOT: Temp. -Alarm	**Error:** Motor temperature monitor triggered during the trip (error evaluation only if error no. 575 is entered in the mask function) **Remedy:** Check the parameter in the "Motor name plate" menu check the motor's duty cycle, check the motor for winding short, check the encoder Check the brake function	●	●
582	BR:T2 too small	**Error:** Brake does not open within time T2 (only active if brake monitor is switched on) **Remedy:** Check the brake triggering, check the brake opening time, check the configured brake opening time "T_2" in the "Start" menu and increase if necessary		●
583	BR: Fault Travel	**Error:** Brake monitoring contacts triggered during travel **Remedy:** Check the brake triggering, check the monitoring contacts, check the power supply of the brakes **Info:** inverted Function If entered in the mask, the error leads to immediate stop of travel	●	●
584	BR: Fault Travel	**Error:** Brake monitoring contacts triggered during travel Fault message at end of travel with additional information = 0: Brake monitor contacts have switched during travel but the brake was not closed Fault message without immediate interruption of travel and additional information ≠ 0: Brake was closed during travel **Additional information:** Indicates consequential fault **Remedy:** Check the brake triggering, check the monitoring contacts, check the power supply of the brakes	●	●
585	BR: T5 too small	**Error:** Brake does not close within time T5 (only active if brake monitor is switched on) **Remedy:** Check the brake triggering, check the brake closing time, check the configured brake opening time "T_5" in the "Stop" menu and increase if necessary		●
586	BR: Stop-Error	**Fault:** Monitoring contact of the brake briefly signals "Brake closed and then "Brake open" again longer as the time T5 (only active with the brake monitor switched on) **Remedy:** Check the brake triggering, check the brake closing time, check the configured brake opening time "T_5" in the "Stop" menu and increase if necessary		
590	RV1/RV2:Change	**Fault:** Change the direction specification during active travel **Additional information:** Display of the set direction 1 = RV1 3 = RV2 **Remedy:** Check control of travel directions	●	●

13.5.9 Error 7xx

- Trip abort due to errors between frequency inverter and control system

Error no.	Error text	Error cause	M	S
710	DCP: Timeout	Error: DCP communication interrupted during travel **Remedy:** check wiring (shields)	●	●
715	DCP: G0-G7 fail !	**Error:** Transmission error in the DCP protocol: Telegram for the speed preset (G0-G7) not received **Remedy:** Possibly the DCP-function of the elevator control is not compatible	●	●
720	DCP: Delay fail	**Error:** The DCP residual path increases during deceleration by more than 5cm **Remedy:** Check the absolute rotary encoder for its residual path determination Wrong residual path signal from open loop control	●	●
721	DCP: Dist. fail	**Fault:** There is no change in the residual path for 200 ms during the run **Remedy:** Check the absolute rotary encoder for its residual path determination Wrong residual path signal from open loop control	●	●
722	DCP: s_rest = 0?	**Error:** Residual path > 20mm jumps to 0mm **Remedy:** Check the absolute rotary encoder for its residual path determination Wrong residual path signal from open loop control	●	●
723	DCP: s_rest < 0!	**Error:** A negative residual path is transmitted during travel Remedy: Check the DCP wiring	●	●
780	DCP: Quick Start >20s	**Error:** In the quick start function, input "V=0" is triggered for over 20s **Remedy:** Shorten the time in which "V=0" is triggered	●	●
781	v0 at travel ?!l	**Error:** Input "V=0" is triggered during travel **Remedy:** Check the triggering of "V=0"	●	●
799	RF:Failure	**Error:** Control enable RF was switched off during travel (error evaluation only if error no. 799 is entered in the error mask) **Remedy:** Check the triggering of "RF"	●	●

13.5.10 Error 8xx

- CAN-specific errors

If an error occurs during operation with CANopen, the frequency inverter runs through status "ST_Delay" and finally goes to status "Wait drivecom. off". At this status the frequency inverter waits until the control system sends the command "Fault Reset".

Error no.	Error text	Error cause	M	S
800	CAN: Timeout	**Errors in Velocity Mode:** Heartbeat from control system is missing or at wrong time. **Errors in Position Mode:** Heartbeat from control system and/or encoder is missing or at wrong time. **Remedy:** Check CAN-connection Check if devices have the right heartbeat.	●	
810	CAN: Quick Stop Det.	**Error:** Control system activates a quick stop.		
820	CAN: Illegal Status	**Error:** Control system sends commands in wrong order. **Remedy:** Take care to the right order in CAN drive cycle	●	
830	CAN: Timeout Enab.-Det.	**Error:** Control system gives command "Enable Operation" not within T_CMD **Remedy:** Increase time for T_CMD		
831	CAN: Timeout Dis. Op.	**Error:** Control system gives command "Disable Operation" not within T_CMD **Remedy:** Increase time for T_CMD		

Error no.	Error text	Error cause	M	S
832	CAN: Timeout Shut-down	**Error:** Control system gives command "Shutdown" not within T_CMD. Occurs by closing the brakes. **Remedy:** Increase time for T_CMD		
833	CAN: Timeout Dis. Vol.	**Error:** Control system gives command "Disable Voltage" not within T_CMD. Occurs at end of travel. **Remedy:** Increase time for T_CMD		
840	CAN: ENC. Info missing	**Error:** The object "Encoder Info" was not written to the frequency inverter by the control system		

13.5.11 Error 9xx

- Fatal error, which can only be acknowledged by switching off the frequency inverter

Error no.	Error text	Error cause	M	S
905	MOP:HW-SW Error	**Error:** A hard- or software error occured after switching on the inverter. After 60s the inverter chabges to "Wait-Switch off" **Remedy:**Check the connectors between the Control Unit and Modul Print check the fuse on the Switching Power Print no Modul Print existing check EEprom on the Modul Print		
907	PFU: BR missing	**Fault:**When using a feedback unit in connection with a brake resistor the monitor contact of the brake resistor is not closed The temperature is monitored via a digital input with the function "PFU_BR" **Remedy:** Check connection of brake resistor temperature monitor, Check function of brake resistor temperature monitor, Check assignment of the ""PFU_BR" monitor function in the “Control” menu		
908	PFU: No function	**Fault:**When switching on the converter, the monitor contact of the feedback unit is not closed **Remedy:** Check connection of the feedback unit function monitor, Check feedback unit function monitor		•
909	PFU: Fault	**Fault:** Monitor contact of the feedback unit opens during operation of the converter **Remedy:** Check connection of the feedback unit function monitor, Check feedback unit function monitor		•
910	BC: No function	**Error:** When switching on the inverter, the monitoring contact for the Brake-Chopper or Brake resistor is not closed **Remedy:** Check the temperature monitor for the Brake-Chopper or Brake resistor, check the temperature monitoring for the Brake-Chopper or Brake-Resistor,		
911	BRxx: Overload	**Error:** The continious braking power of the Brake resistor is exceeded by 150 % within 120 s The inverter switches off during the travel **Remedy:** Check the configuration of the BR-type Check the connected BR	•	
912	BC: Fault	**Error:** Monitoring contact for Brake-Chopper or Brake resistor opens while the inverter is operating **Remedy:** Check the temperature monitor for the Brake-Chopper or Brake resistor, check the temperature monitoring for the Brake-Chopper or Brake-Resistor,		
913	DC: U_DC>U_BC	**Fault:** at a standstill, the voltage measured at the intermediate circuit (+DC/-DC) after 5 s is higher than trigger voltage U_BC **Remedy:** Defective analysis of the DC-link voltage U_DC The synchronous motor is operated without motor contactors and driven by an external load	•	

Error no.	Error text	Error cause	M	S
914	X-ENC15:Miss.	**Fehler:**Bei Einschalten des Umrichters wird kein Geber an X-ENC 15 erkannt **Remedy:** Check encoder connection reset the inverter		
916	X_ENC15:Discon.	**Error:** Interruption of the encoder signal during travel **Remedy:** Check encoder connection Switch frequency inverter off and then back on		
917	BRxx activ	**Error:**The internal Transistor for the brake resistor is still triggered 5,5s after travel-end	●	
918	MP:Temp.missing	**Error:** Temperature detector on power stage is not supplying any measure-ments **Remedy:** Change the device Check fuse on SP board		●
920	MOP:ERRNMI active	**Error:** Overcurrent during standstill **Remedy:** Check the brake chopper / brake resistor wiring	●	
930	MP: UCE Alarm BR	**Error:** The voltage monitoring of the transistor of the Brake resistor has triggered (Overcurrent of the electric circuit of the Brake resistor) **Remedy:** Check wiring of the Brake-Resistor Check Brake-Resistor Check whether the correct type is configured in the "Encoder & BC/BC_Typ" menu		●
931	MP:ERR_EXT active	**Error:** internal error message of the output stage **Remedy:** Switch frequency inverter off and then back on Replace the device (only after consultation of the Ziehl-Abegg-Hotline)		●
950	TD_CNT: Drive Limit	**Error:** Number of maximum drives reached! Only one travel with the actual rope remains. **Remedy:** Change ropes and reset the down counter. After resetting the ZETADYN 3 there is one additional drive possible.		●
994	MOP: Timeout 2	**Error:** I standstill the communication between the Motor-Management-Pro-cessor (MOP) and the Application-Processor (APP) is interupped for more than 7.5 s Increased BR-protection	●	
995	ENC:1387 CD-Lim	**Fault:** signal track C and/or D of absolute value encoder type ERN1387 exceeds permitted limit value before travel starts **Remedy:** Check the encoder, Check the optional pcb for encoder connection Fault can only be reset once the frequency inverter is switched off	●	●

13.5.12 Information texts

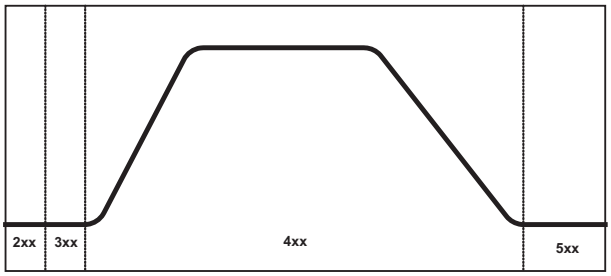
An information text appears in the display for approx. 2 s for faults which are not saved in the fault list.

Information text	Cause
CO-Interrupt	During a non distance-dependent travel (speeds V4 ... V7) the travel contactors are opened. During the halt process the motor contactors open before the timer T5b has expired. The number of CO interruptions is counted in the **Statistics/SCO** menu.
RF-Interrupt	The controller enable (signal CE) is deactivated during travel. During the halt process the controller enable (signal CE) is deactivated before the timer T5b has expired. The number of CE interruptions is counted in the **Statistics/SCE** menu.
s1 = 0 cm	During the distance-dependent delay phase from travelling speed V2 or V3 to position-ing speed V1 the signal is already deactivated for the positioning speed V1.
Attention! n*>n	Calculated speed n* is greater than the speed n specified on the rating plate.
automatic pre-signment?	After changing the parameter V*, you can confirm the request " automatic pre-sign-ment?" with yes or no.
Until rope change xxx travels possible	Shows the remaining travels with the actual rope. Information will be shown in the display until pressing the [ESC] button.

13.6 Operating conditions of the inverter

The frequency inverter software divides the operating curve into various sections. Each of these sections is assigned a status number that refers to a defined service condition.
If an error occurs, the status number is stored with the error number in ther error list.
Furthermore, the operating conditions are displayed with the status number and in plain test in the "Info/Page02" menu.

status	Condition of the inverter	status	Condition of the inverter
10	Checking of voltage supply	430	Constant running at speed V3(time-dependent, V1 is not activated)
21	Check software version	431	Round down the acceleration to V3 (distance-dependent)
22	Parameter transmission	432	Linear acceleration to V3 (distance-dependent)
30	Check absolute value encoder	433	Constant travel with V3 (distance-dependent)
41 42	Check input BC 41: Power feedback unit 42: Brake chopper or brake resistor	435	Deceleration with safety ramp
50	Adjust current transformer	440	distance dependent travel with DCP4
70	Check temperature power unit	480	Retract to standstill
100	Device off	490	fast stop
105	Power feedback unit on standby	500	Keep motor at speed 0 (T4)
110	Machine ready	510	Wait until motor brakes are closed (T5)
200	Start-up check	515	Brake gets additional current feed for 1s
210 ... 223	Check absolute value encoder	520	S Switch off current to motor (T5b)
300	Wait until motor contactors switched on (T0)	530	Wait until motor contactors switched off (T6)
305	Checking the motor phases	535	Travel interrupted due to interruption of the controller enable RF
310 311	A Build-up of magnetic field in the motor (T1)	536	Travel interrupted due to interruption of the contactor monitor COx
320	Wait until motor brakes have opened (T2)	540	Wait for standstill
330	Accelerate motor to speed V_T3 (T3)	550	Checking the input BR after travel finished
340	Start up	560	End of travel
400	Accelerate to speed Vx	900	Delay of automatic acknowledgement after remedying the cause of the fault (2 s)
402	Constant running at speed Vx	950	Parameter change
404	Delay from speed Vx	982	Motor type changed
410	Constant running at speed V1	988	Wait for reset
420	Constant running at speed V2	990	Fault input BC
421	Round down the acceleration to V2 (distance-dependent)	991	No absolute value encoder detected
422	Linear acceleration to V2 (distance-dependent)	992	Temperature of the power section missing
423	Constant travel with V2 (distance-dependent)	997	Frequency converter is in stand-by mode
424	Rounding up and linear delay from V2 (distance-dependent)	998	Wait until frequency converter is switched off
425	Rounding down of the delay from V2 (distance-dependent)		



Travel curve with related status numbers

13.7 Automatic parameter check (APC)

The Automatic parameter check checks the input values for plausibility and tolerances while the parameters are being entered.
The APC function aims to prevent erroneous parameter inputs. Every message must be acknowledged by the user with the ↵ key
You can activate or deactivate the APC function in the **Monitoring / APC** menu. The factory setting is ON.

```
Monitoring
↳APC      On
  ↳       On
Auto.Parameter Control
```

Through the APC function:

- Values are restricted (Limit)
- Parameters are set (Set)
- Parameters are updated (Update). Parameters that are not preset are updated during a software update.

13.8 Automatic parameter diagnostics (APD)

During Automatic parameter diagnostics, the following are checked:

- The parameters for plausibility and tolerances
- Device functions for functional errors

Erroneous parameters or functions are shown in the display.
Every message must be acknowledged by the user with the ↵ key. The APD function can be activated in the **"Statistic / APD"** menu. After checking, the function is reset to "OFF".

```
Statistic
↳APD      Off
  ↳       On
Auto. Parameter
```

14 Energy saving

14.1 Stand-by function frequency converter

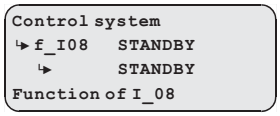
To save energy at standstill the frequency converter ZETADYN 3 can be switched to stand-by mode. Internal components of the frequency converter are switched off in stand-by mode. This means that the frequency converter has a much lower power loss at standstill.

	ZETADYN								
	3xx011	**3xx013**	**3xx017**	**3xx023**	**3xx032**	**3xx040**	**3xx050**	**3xx062**	**3xx074**
Power losses during standstill [W]	24			27			32		
Power loss in stand-by [W]	11	11	12	12	13	13	14	16	17

14.1.1 Activation of stand-by mode

Switching to standby mode is only possible when the controller enable (input CE) is switched off.

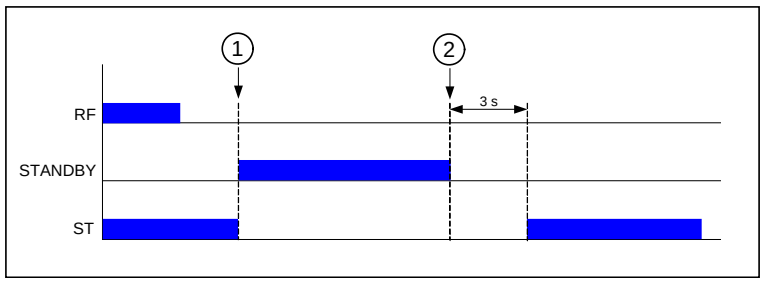
Configure digital input in the **Control system**menu to **STANDBY**.



Activation of the STANDBY digital input:

- Converter switches to standby mode
- Output **ST fault** is deactivated

3 s after deactivation of the digital STANDBY input the frequency converter is ready for operation again. The ST fault output is activated (see diagram).



Function stand-by mode ZETADYN 3

1 STANDBY input is activated
2 STANDBY input is activated
RF Controller enable
STANDBY Input with STANDBY function
ST Fault

14.2 Power Feedback Unit (PFU)

The power feedback unit offers the possibility to save energy by feeding the energy generated in a generator run into the supply network. This energy is used by other consumers in the building.

Information

By using a power feedback unit graduation in energy efficiency class A according to VDI 4707 can be achieved!

14.2.1 Stand-by operation of the power feedback unit

To reduce the power loss of the power feedback unit at standstill the REVCON power feedback unit can be switched to stand-by mode.

		Revcon				
		SVC 07- 400	**SVC 13 - 400**	**SVC 22 - 400**	**SVC 33 - 400**	**SVC 70 - 400**
Power losses during standstill	[W]	24				
Power loss in stand-by	[W]	8				

14.2.1.1 Activation of stand-by mode

Parameterise digital output (preferably PWM) in the **Control system** menu to the **PFU** function.

```
Control system
↳ f_PWM   PFU
  ↳       PFU
Function PWM
```

To switch the power feedback unit to stand-by mode the output A2 of the power feedback unit must be switched to GND!

Deactivation of the digital output PFU:

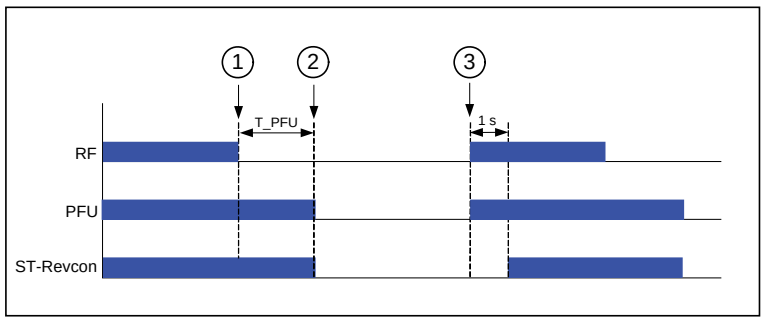
- Power feedback unit switches to standby mode

The time between the end of travel and activation of the PFU output can be specified with the **Encoder & BC/T_PFU** parameter.

```
Encoder & BC
↳ T_PFU   0            s
  ↳       60
Wait time PFU PWM
```

If the parameter **T_PFU** is set to **0s** , the output PFU is always active.
Standby is now deactivated.

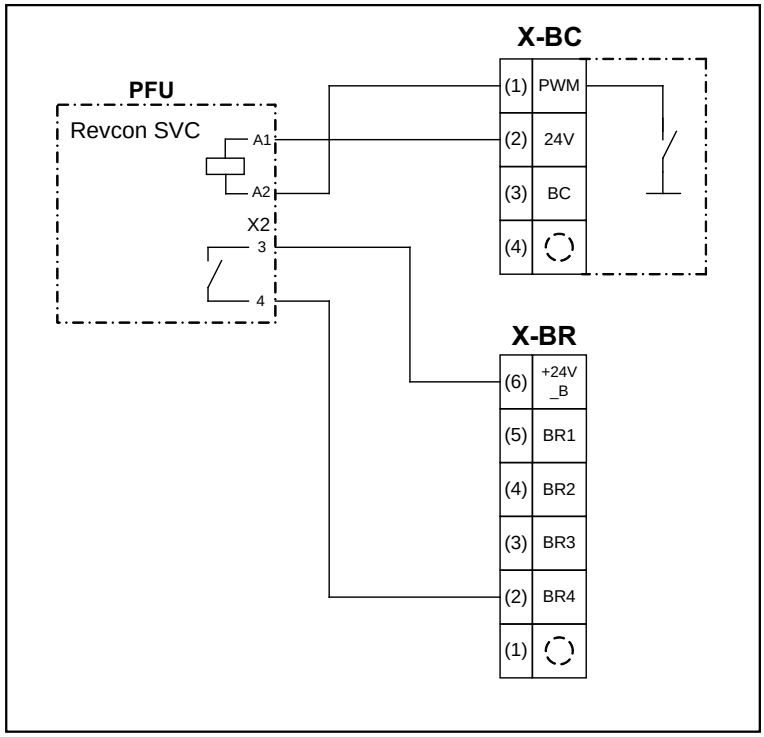
1 s after deactivation of the digital output PFU the power feedback unit is ready for operation again (see diagram).



Function stand-by mode Revcon

1 End of travel
2 Output with the "PFU" function is activated
3 Output with the "PFU" function is deactivated
RF Controller enable
PFU Output with the "PFU" function
ST-Revcon Output "Fault" of the power feedback unit

14.2.1.2 Electrical connection stand-by mode



Connection Revcon power feedback unit with stand-by mode

14.2.1.3 Power feedback unit in connection with automatic emergency evacuation.

CAUTION!

In lift systems with automatic emergency evacuation by a single-phase mains supply (emergency power supply unit/UPS) or battery (EVAC 3B) the power feedback unit is not active due to the too operating voltage failure. To avoid too high a voltage in the intermediate circuit when evacuating by a generator run, a brake resistor must be used in addition to the power feedback unit!

The combination power feedback unit + brake resistor must be entered in the **Encoder & BC/BC_Typ** menu

```
Encoder & BC
↳ BC_TYP  PFU+BR17
  ↳       PFU+BR25
BR/BC-Type
```

15 Special functions

15.1 Changing the Clock frequency

The factory setting of the frequency converter's clock frequency depends on the size and motor type:

Model size	Synchronous motor	Asynchronous motor
ZETADYN 3xx009-1 ZETADYN 3xx011 ZETADYN 3xx013 ZETADYN 3xx023 ZETADYN 3xx032 ZETADYN 3xx040	Clock frequency 16 kHz auto (Parameter M_PWM=Auto)	Clock frequency 16 kHz auto (Parameter M_PWM=Auto)
ZETADYN 3xx050 ZETADYN 3xx062 ZETADYN 3xx074 ZETADYN 3xx110 ZETADYN 3xx180	Clock frequency 8 kHz fix (Parameter M_PWM=Fix f_PWM)	Clock frequency 16 kHz auto (Parameter M_PWM=Auto)

Information

If necessary the clock frequency can be changed continuously between 2.5 and 16 kHz in the **Power section** menu.
For release the ESC key must be pressed for approx. 5 s. until **Ziehl-Abegg-Intern FREIGABE** appears in the display.

Information

Only change the clock frequency after consultation with the Ziehl-Abegg hotline. Consultation can clarify the effect of changing the clock frequency on the service life of the frequency inverter.

CAUTION!

Caution!

Increasing the clock frequency causes

- **a performance reduction of the frequency inverter (see Technical Data chapter)**
- **a greater power loss and thus increased heating of the frequency inverter**

The service life of the frequency inverter is negatively influenced by the higher temperatures.

15.1.1 Fixed presetting of the clock frequency (Menu Power sectionl/M_PWM=Fix f_PWM)

After setting at the factory, the cycle frequency of the frequency inverter is 8 kHz. If required, this can be changed infinitely between 2.5 and 10 kHz in the menu "Leistungsteil/f_PWM".

15.1.2 Automatic adjustment if the clock frequency (Menu Power sectionl/M_PWM=Auto)

The inverter works with the clock frequency which is configured in the the enu "Power section/f_PWM_H".
If required the inverter switches to the clock frequency which is configured in the menu "Power section/f_PWM"

15.2 Encoder offset-alignment

CAUTION!

Caution!

S

Make sure you perform an encoder alignment if you operate a synchronous motor. Operating the motor without encoder-offset alignment can cause uncontrolled motor movements.
Traveling is prohibited before an absolute encoder offset alignment has been performed!

Information

In Ziehl-Abegg motors, the absolute encoder is already aligned in the factory to the offset value "0".
It is not necessary to perform an absolute encoder offset alignment!

Options for calibrating an absolute value encoder
The frequency converter ZETADYN 3BF has two different methods of calibrating the absolute value encoder:

- **load-free** calibration of theabsolutevalue encoder
- calibration of the absolute value encoder with **brake closed**

General conditions required for an encoder alignment without load:

- The installation and motor data must be configured
- Load-free operation (ropes must be removed from the traction sheave)
- Brake monitoring must be activated corresponding to the number and type of brakes in use ("Monitoring / BR" menu)
- Contactor monitoring must be configured according to the type of contact for monitoring ("Monitoring / CO" menu)
-

General conditions required for an encoder alignment closed brake:

- The installation and motor data must be configured
- It must be ensured that the brake does not open during the calibration (disconnect brake)
- Brake monitoring must be activated corresponding to the number and type of brakes in use ("Monitoring / BR" menu)
- Contactor monitoring must be configured according to the type of contact for monitoring ("Monitoring / CO" menu)

15.2.1 Load-free alignment SSI-Encoder

When aligning the SSI encoder, the frequency inverter supplies the motor with direct current. During this, the rotor jumps to the middle of the nearest magnetic poles. In this rotor position, the absolute rotary encoder must be manually aligned to its zero point. To ease installation, it is recommended to connect the encoder to the frequency inverter before installation and to align the offset value "0" (value in **Encoder-adjust. / ENC_POS** menu). After that, mount the encoder into position - shifting as little as possible – into the position in which the terminal screw is easily accessible.

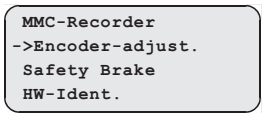
Information

The calibration should always be done twice. Any inaccuracy in the 1st calibration is detected by the 2nd calibration and can be corrected.

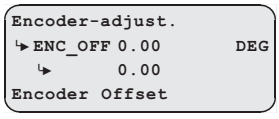
If the encoder terminal screw is not accessible in the "ENC_POS = 0" position, the encoder can be adjusted to the value of any pole pair (see table).

Pole pair	ZETATOP-motor SM 160 / SM200 / SM225 / SM250	ZETASYN-motor SM700 / SM860
1	0	0
2	819	546
3	1638	1092
4	2458	1638
5	3277	2185
6	4096	2731
7	4915	3277
8	5734	3823
9	6554	4369
10	7373	4915
11	-	5461
12	-	6007
13	-	6554
14	-	7100
15	-	7646

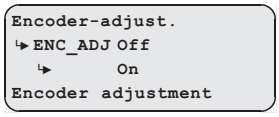
Carrying out the load-free alignment with SSI-encoder



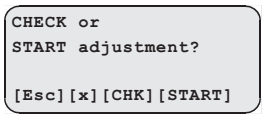
Select menu **Encoder adjustment**



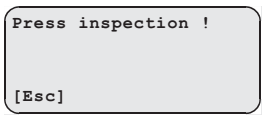
Select parameter **"ENC_OFF"**
Enter "ENC_OFF=0"



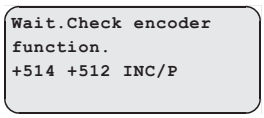
Select parameter **"ENC_ADJ"**
Switch on encoder adjustment with "ENC_ADJ=ON"



Start Encoder-adjustment with **[START]**

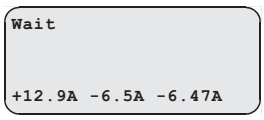


Keep the inspection run push-button pressed.

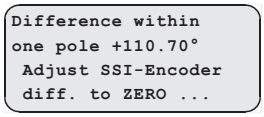


The motor is powered in phase U and the rotor to zero of the next pole.
Encoder check, check the motor data for plausibility.

- Display of number of expected (calculated) impulses / pole pair (e.g. 512)
- Display of impulses counted between the poles (e.g. 514)



Rotor is held in zero point of the next pole
- Display of motor current of phases U V W



Offset value (electrical angle, 360° per pole)

Adjust encoder mechanically?

No

Adjustment by entering the offset value:
The encoder is not moved mechanically, the offset value is retained and is corrected by entering the encoder offset value in the controller unit.
The offset value must be available when changing devices!
If the value is not available, a new encoder adjustment must be made!

End the adjustment procedure by switching off the inspection run.

```
Please check and
if necessary set
ENC_OFF=249.32°
[OK]
```

The encoder offset must be corrected to the specified value!
The value must be noted.

```
Encoder-adjust.
↳ENC_OFF 249.32     DEG
  ↳      249.32
Encoder Offset
```

Yes

Mechanical adjustment of the encoder:
Adjust the encoder as exactly as possible to the value **0°** by turning and tighten the locking screw carefully, correct the encoder position if necessary.
At the end of the adjustment procedure the encoder must be tightened and value close to **0**.
At deviations less than ± 2.00° the adjustment is considered correct. A
deviation of max. ± 1° is recommended.

End the adjustment procedure by switching off the inspection run.

```
Mechanical SSI-
Adjustment is quite
correct!
[OK]
```

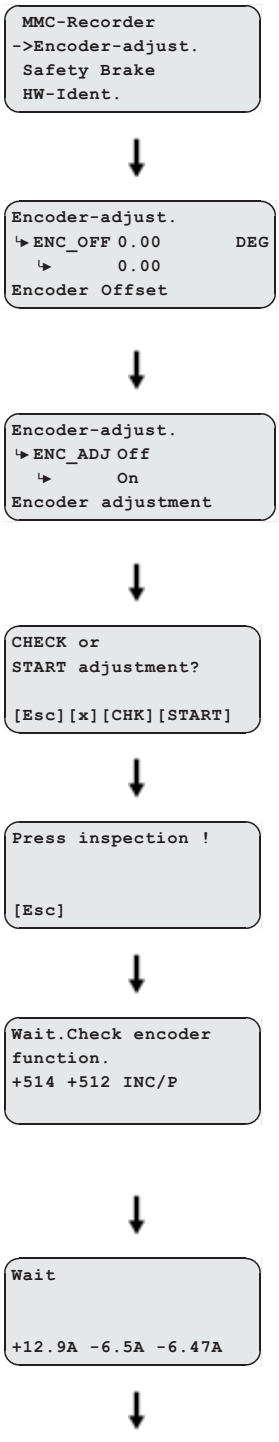
15.2.2 Load-free alignment EnDat-Encoder

When aligning the EnDat encoder, the frequency inverter supplies the motor with direct current. During this, the rotor jumps to the middle of the nearest poles. In this rotor position, the offset value is stored in the encoder, which sets the encoder to the “0“ position.

Information

The calibration should always be done twice. Any inaccuracy in the 1st calibration is detected by the 2nd calibration and can be corrected.

Carrying out the load-free alignment with EnDat-encoder



Select menu **Encoder adjustment**

Select parameter **"ENC_OFF"**
Enter "ENC_OFF=0"

Select parameter **"ENC_ADJ"**
Switch on encoder adjustment with "ENC_ADJ=ON"

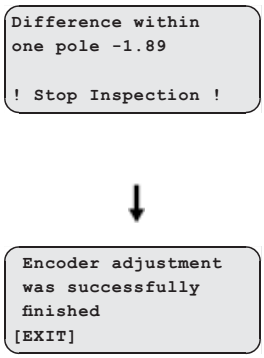
Start Encoder-adjustment with **[START]**

Keep the inspection run push-button pressed.

The motor is powered in phase U and the rotor to zero of the next pole.
Encoder check, check the motor data for plausibility.

- Display of impulses counted between the poles (e.g. 514)
- Display of number of expected (calculated) impulses / pole pair (e.g. 512)

Rotor is held in zero point of the next pole
- Display of motor current of phases U V W



Display of difference between calculated and measured angle between 2 poles

End the adjustment procedure by switching off the inspection run.
The offset value is saved in the encoder.

15.2.3 Checking the load-free alignment of the SSI- & EnDat-encoders

When checking the encoder offset, the frequency inverter supplies each individual pole in the motor with direct current. The offset is determined on each pole and the average offset is calculated from that. This offset can be stored in the frequency inverter.

Information

The offset determined during the inspection is not stored in the frequency inverter because if the inverter is replaced, the new inverter will not have the identical encoder offset. You must carry out a new encoder offset alignment or enter the old encoder offset.

Information

During the encoder-offset alignment, the traction sheave must turn in the right-hand direction (when looking at the traction sheave). After completing the alignment, the traction sheave must be in the same position as when the procedure was started.

Saving the checking

To save the result, a memory card needs to be in the X-MMC card slot during the check.
The result is filed under **travel number.POL** in the folder **/3BF/DEVICE/Seriennummer/LST.**

Carrying out the checking of the encoder offset

```
 MMC-Recorder
->Encoder-adjust.
 Safety Brake
 HW-Ident.
```

Select menu **Encoder adjustment**

↓

```
Encoder-adjust.
↳ENC_OFF 0.00        DEG
  ↳      0.00
Encoder Offset
```

Select parameter **"ENC_OFF"**
Enter "ENC_OFF=0"

↓

```
Encoder-adjust.
↳ENC_ADJ Off
  ↳      On
Encoder adjustment
```

Select parameter **"ENC_ADJ"**
Switch on encoder adjustment with "ENC_ADJ=ON"

↓

```
CHECK or
START adjustment?

[Esc][x][CHK][START]
```

Start check with **[CHK]**

↓

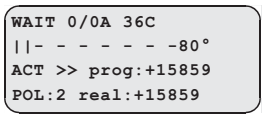
```
Press inspection !


[Esc]
```

Keep the inspection run push-button pressed for approximately 2 minutes.
The offset value check now runs automatically and lasts about 2 minutes.
The rotor now makes a full revolution and the offset value is determined at every pole.

↓

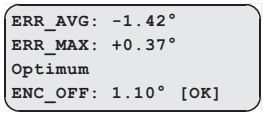
```
Press inspection !

Iu + 13.0A
Iv + 6.5A
```

↓



Information is shown in the display during automatic adjustment:
Line 1:
0/0A: Current in motor phase U / V
36: Current temperature of the power unit
Line 2:
Display rotor position
Line 3:
ACT: Current action
M1 / M2: Measurement 1/2
-> <- Slow positioning of a pole
>> << Fast positioning of the next pole
prog: Latest current pointer position
Line 4:
POLE: Number of the approached pole pair
real: Currect encoder position within a pole

Release inspection run push-button



Result of the check is displayed:
Line 1:
ERR_AVG: Average error in degrees (electr. angle)
Line 2:
ERR_MAX: Maximum error in degrees of average value
Line 3+4:
Optimum ENC_OFF: Correction factor encoder offset (electr. angle)

15.2.4 Encoder alignment with closed brakes

If the encoder is calibrated with the brake closed, there is no need to take the cables off the traction sheave. This allows calibration to be performed with much less effort.

CAUTION!

Caution!

The electric brake of the motor may not open during the encoder calibration!
It is recommended to remove the electrical connection of the brake for the duration of the encoder calibration!

Information

Considerable noise may occur at the motor for 10 - 15 s during calibration. These noises are caused by the special form of energization of the motor and are normal for this kind of encoder calibration.
Pleas keep the button for the inspection travel still closed!

CAUTION!

Caution!

The offset determined (ENC_OFF) must be entered manually in the menu **Encoder-Abgleich/ENC_-OFF**. This saves the offset in the frequency inverter.
If the device is replaced, the offset needs to be entered in the new device!

Perform calibration of EnDat or SSI encoders

```
 MMC-Recorder
->Encoder-adjust.
 Safety Brake
 HW-Ident.
```

Select menu **Encoder adjustment**

```
Encoder-adjust.
↳ENC_OFF 0.00       DEG
  ↳      0.00
Encoder Offset
```

Select parameter **"ENC_OFF"**
Enter "ENC_OFF=0"

```
Encoder-adjust.
↳ENC_ADJ Off
  ↳      On
Encoder adjustment
```

Select parameter **"ENC_ADJ"**
Switch on encoder adjustment with "ENC_ADJ=ON"

```
CHECK or
START adjustment?

[Esc][x][CHK][START]
```

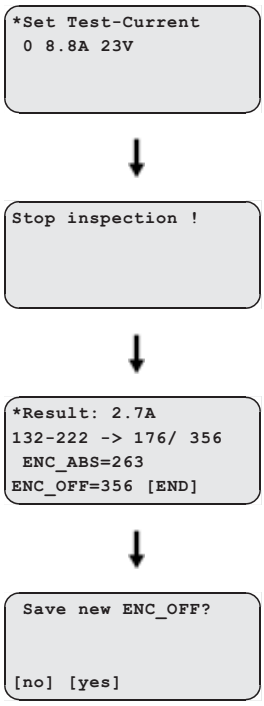
Start check with **[X]**

```
Is the elec. connec.
to the mechanical
brake disconnected?
[Esc] [Yes][No]
```

Disconnect electrical connection of the mechanical brake

```
Press inspection !


[Esc]
```

Keep the inspection run push-button pressed.



Motor voltage is increased until motor current flows.
Calibration is performed.

Release inspection run push-button

Result of the adjustment is displayed (176 / 356)

Query whether determined encoder offset is to be saved
[yes]: Value is saved
[no]: Value is not saved

15.2.5 Alignment absolute encoder type ERN1387

The calibration of absolute value encoders of type ERN1387 corresponds to calibration with brake closed.

Information

To minimize inaccuracies in determination of position, the sensor calibration must be performed **4 times** with the brake closed!

The traction sheave needs to be turned through approx. 90° after every calibration.

Positions for the encoder alignment

Carry out encoder calibration type ERN1387

```
* Result: 2.7A
144-228 -> 186/ 6

ENC_OFF= 6 [END]
```

Perform encoder calibration 4 times with brake closed.
Note the value for ENC_OFF after each calibration

$$ECN\_OFF = \frac{ECN\_OFF_1 + ECN\_OFF_2 + ECN\_OFF_3 + ECN\_OFF_4}{4}$$

Calculating the average offset

```
Encoder-adjust.
↳ENC_OFF 6.00 DEG
  ↳      6.00
Encoder Offset
```

Enter mean offset in parameter **ENC_OFF** in the menu **Encoder-adjust.**

15.2.6 Error messages during encoder offset alignment

Error no.	Error text	Error cause
01	Drop out of inspect.	Measurement was aborted too soon
05	Phase UVW is missing	Phase current too small Iu < 200mA Iv, Iw < 100mA
06	No encoder impulses	no encoder pulses Encoder defective or motor brake is closed
07	Wrong dir. Check UVW	Wrong direction motor phases are mixed up
08	Wrong amount of pole	Wrong number of pole pairs Deviation of the increments by ± 10% within one pole
10	Asym. current	Motor current is unsymmetrical
12	Drop out of inspect.	Signals for the inspection trip were removed too early
30	BR is not off.	Brake monitor contacts are active even before the encoder offset alignment started
40	CO1 does not turn on	Contactor monitor contacts do not switch or contactors are not open
50	BR does not turn on	Brake monitor contacts do not switch or brakes are not open
52	Input CO interrupt	Contactors open during encoder calibration
60	Adj.cannot be stored	Encoder error, absolute value cannot be written into the encoder memory
61	Adj.did not store	Encoder error, absolute value not saved in encoder
70	BR1..4 are activ	Brake opens when carrying out an encoder calibration with closed brake
71	Check nominal power!	Motordaten sind nicht korrekt

15.3 Safety Brake

Function to release the car from the safety gear.

In this function, the motor builds up its maximum torque dependent on the configured values for the pulse sequence, thus attempting to pull the car from the arrester.

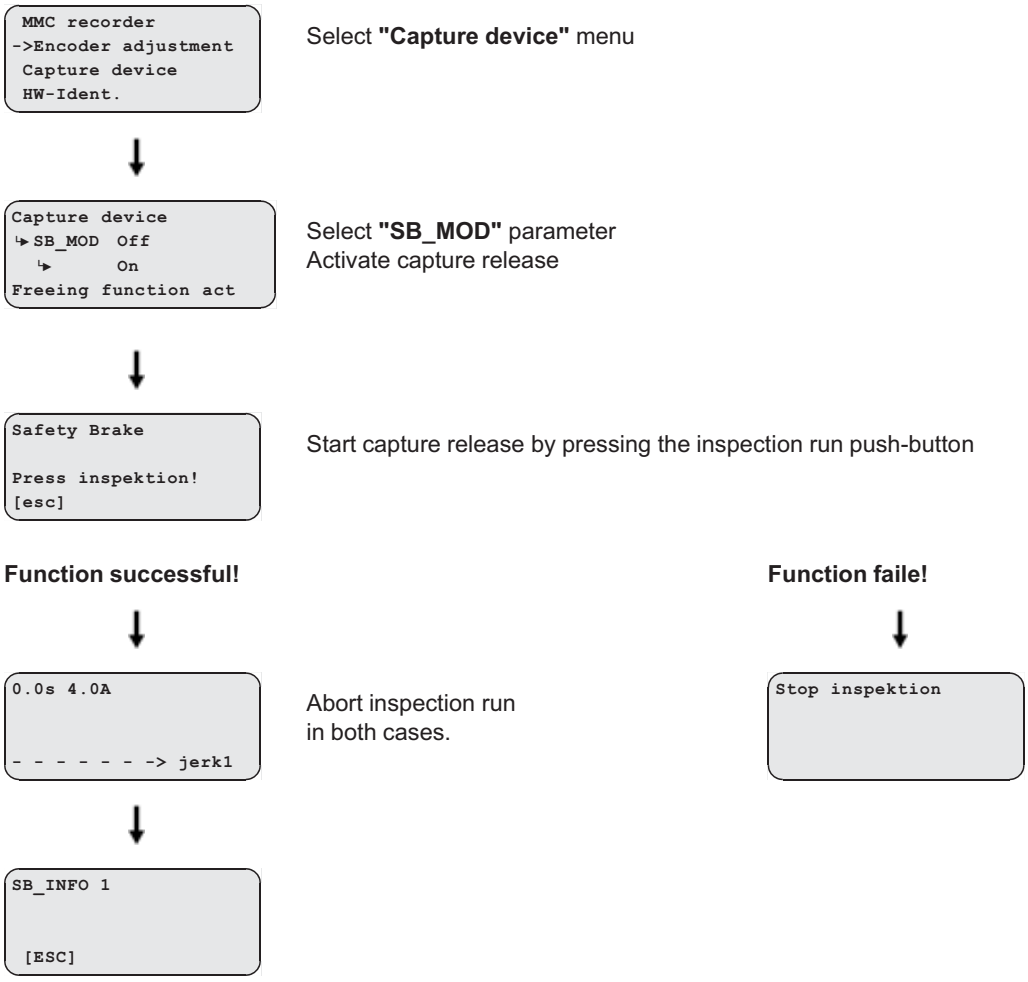
In order to provide the maximum power, the clock frequency of the pulse width modulation is reduced during the safety-brake function time.

CAUTION!

Caution!

Do not repeatedly carry out the safety brake function because that can destroy the frequency inverter.

Carrying out the safety brake-function



Information
If required, the parameters impulse amplitude, impulse time, impulse pause and number of impulses can be changed in the **Capture device** menu.

Possible errors during safety gear mode

Error no.	Error description
1	The travelling was interrupted too early by the user. Travel command has to be longe existent.
2	No absolute encoder existent. Check encoder connection.
3	No value could be read out of the encoder. Check encoder cable.
10	Asymetric motor current. Difference over 12.5%. Check motor phases / contactors.
30	The brake release monitoring reports open brakes although the frequency inverter did not open them. Check brake monitoring respectively the brakes.
40	Motor contactors do not switch.
50	Brake does not switch.
71	SIN / COS - Error
72	Missing SSI module
73	Missing SSI dialogue
74	EnDat Light Error
75	EnDat Amplitude Error
76	EnDat Position Error
77	EnDat Supply Error

15.4 Reset

Allocating the parameters of the frequency inverter with a factory setting or customer specific settings. The works setting is made by a numeric input in the **Statistics/RESET**menu.

Reset-functions:

Reset-No.	Effect
77	**preset parametred frequency inverter:** Parameters will be set with customer specific datas **Standard frequency inverter:** Parameters will be set with standard data
90	deleting of: • Parameter • Error list • Error messages Parameters will be set with standard data
99	deleting of: • Parameter • Error list • Error messages • Encoder-Offset "ENC_OFF" (will be set to 0) Parameters will be set with standard data

CAUTION!

Caution!

S

In synchronous motors, the parameters for the encoder offset (ENC_OFF) are set to 0 during a reset. If a value was entered beforehand for ENC_OFF, after performing a reset either an encoder-offset alignment must be carried out or the old values for ENC_OFF must be entered!

Operating the motor without encoder-offset alignment can cause uncontrolled motor movements!

CAUTION!

Attention! - Reset 90 and 99

Any pre-configuration carried out in the Ziehl-Abegg factory is lost when the reset is carried out.
The parameters are assigned the factory settings. These do not correspond to the pre-configuration!

Information

You can only start-up again after entering the parameters in the **Motor name plate**, **Encoder & BC**, **Installation**, **Control system** and **Monitoring** menus (see "Commissioning" chapter).

15.5 Memory card

The following functions are feasible when using a memory card (MMC card or SD card) in the X-MMC card slot:

- Software-Update (see "Memory card / Software update" chapter)
- Storing parameters (see "Parameter list / Menu Memory Card / Function SAV_PAR" chapters)
- Loading parameters (see "Parameter list / Menu Memory Card / Function LOD_PAR" chapters)
- Storing parameter lists, error lists and parameters with allocation of the frequency inverter serial number (see "Parameter list / Menu Memory Card / Function SAV_ALL" chapters)
- Continuous recording of operating curves with an MMC recorder and saving the measurements in standstill (see "Parameter list / Menu MMC recorder" chapter)

15.6 Software Update

If a software update becomes necessary, you can carry it out using a memory card.

The update is available at:

- Internet (www.ziehl-abegg.com)
- Email with software from Ziehl-Abegg
- With software from Ziehl-Abegg written on a memory card

Information

For software updates, the memory card must have free memory amounting to at least 1MB!

Caution!

Carry out a supervised inspection trip after completing the update!

15.6.1 Loading the update on a memory card

(1) Save the update as a ZIP file from Internet download or email to the local data medium.

Saving email update

Saving the download update

(2) Extracting the ZIP file to a local data medium

Extracting the ZIP file

The directory created on the local data medium contains two files:

- "Readme.txt": Contains information about the procedure to update a ZETADYN 3
- "D1275A04.exe": Contains the software update itself. The file name is assigned depending on the software version.

(3) Start the exe file.

Directory content

(4) Select the card reader drive and press "extract".

Select drive and extract

(5) If the extraction was successful, a file structure is stored on the memory card. Confirm with "OK"

"Extraction successful" message

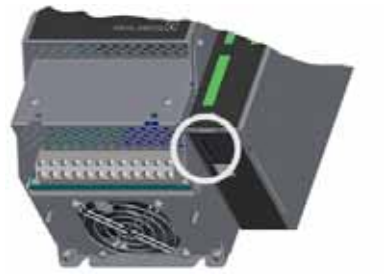
(6) The memory card can now be used for to update.

15.6.2 Updating with the ZETAPAD operating terminal

1. Insert the memory card with the software update into the "X-MMC" card slot **of the ZETADYN 3** (see Fig. in the following chapter).
2. Configure the parameters in the "Memory Card / UPDATE=27" menu.
3. **Do NOT insert the memory card into the card slot of the ZETAPAD!**
4. The Update starts (duration max. 300s).
5. Following another automatic reset, the frequency is once more ready for operation.

15.6.3 Updating without the ZETAPAD operating terminal

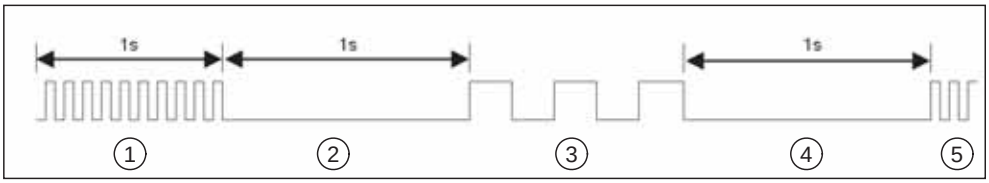
1. Switch off the master switch and wait until the controller unit is voltage free.
2. Insert the memory card with the software update into the "X-MMC" card slot **of the ZETADYN 3** (see Fig.).
3. Switch on the master switch. The inverter starts again.
4. After the LED "OP1" illuminates for the first time, remove the memory card and then reinsert it. You must complete this procedure within 5s (watch for fast "OP1" flash code).
5. The Update starts (duration max. 300s).
6. Following another automatic reset, the frequency is once more ready for operation.



X-MMC card slot position

15.6.4 Error flash code during a software update

If an error occurs during the software update, a flash code is issued by LED OP1 for the corresponding error message.



1 Quickly flashing (10 pulses/s)
2 Break (1s)
3 Slowly flashing (Number of pulses corresponds to the error message in the table below)
4 Break (s)
5 Cycle is repeated

Number of pulses	Error description
1	EEPROM is missing
2	The memory card does not contain a software update
3	The update software on the memory card is identical with the software in the frequency inverter
4	The memory card does not contain a valid software update
5	The files in the update software are identical
6	External application-processor RAM is defective
8,14	Internal programing voltage does not switch on
8,19	Internal programing voltage does not switch off (it is possible that the prog. key is blocked)
16	Error while deleting the program memory (flash delete error)
17	Error while writing the program memory (Flash write error) (Flash write error)
18	Error while checking the written files in the program memory (flash data error)
23	Memory card was removed too early

15.7 Checking the motor phases

To avoid undefined motor activities due to wrong connection, short circuit , broken wires, etc, the motor phases will be checked during the start procedure. Therefor the current in the phases U/V/W will be measured before the brakes are opening.

Due to this monitoring function the starting procedure will be extended by 300ms.By using the factory setting "Single" and having correct monitoring result only the first travel after switching-on the inverter will be extended.

If during the inspection an error is detected the error message **E412 - MOT:UVW fail** is displayed.

The different monitoring functions can be selected in the menu **ZA-Intern/UVW_CHK** . The factory setting is "Single".

Function	Description
Single	Motor phases will be check with the first travel after switching-on the inverter. With a successful control no more further examination is made. If the examination is incorrect, with each start an examination is made until a correct examination could be accomplished.
Cont	Motor phases will be check with each travel
Off	Checking of the motor phases is deactivated

The testing voltage can be selected in the menu **ZA-Intern/UVW_PEK** an. The factory setting is "f(P)".

Function	Description
f(P)	The testing voltage depends on the nominal voltage of the motor, which is entered in the menu **Motor name plate**. In case of an error the testing voltage is displayed in the error message.
1V ... 10V	Selecting the testing voltage between 1 V und 10 V. In case of an error the testing voltage is displayed in the error message.
15V	Test voltage 15V.

Error "E412 - MOT:UVW fail" occurs, but the motor connection is correct
If the error "E412 - MOT:UVW fail" occurs even though the motor is connected correct, maybe the testing voltage is to small. The testing voltage has to be increased manually.

15.8 Field weakening

The operation with field weakening is only possible with asynchronous motor.

If the requiered motor speed n* for an asynchronous motor is higher than the reated speed of the motor, the ZETADYN 3 switches automatically to operation with field weakening (parameter Motor-Model/F_WEAK=Const.).

In operation with field weakening the magnetizing current I_0 is reduced over the complete speed range of the motor. The cos phi of the motor data will be increased. Thereby the required speed will be reached.

The original and the new calculated motor data can be compared in the "Info/page05" menu.

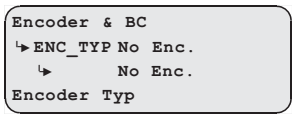
15.9 Operation without encoder (Open-Loop)

Information
Restrictions with Open-Loop-operation:

- no distance dependent deceleration
- no arch-travel
- possibly higher heating of the motor
- worse positioning accuracy than with Closed-Loop-operation
- worse travel confort than with Closed-Loop-operation
- maximum travel speed: 1,0 m/s

15.9.1 Activate operating mode for operation without encoder

To be able to commission a motor without an encoder, the operating mode has to be activated before



Adjust the parameter **ENC_TYP=No Enc.** in the menu **Encoder & BC**

Further procedure is identical to commissioning for operation with an encoder. This is described in the section entitled **Commissioning**.

15.9.2 Parameter for Open-Loop-operation

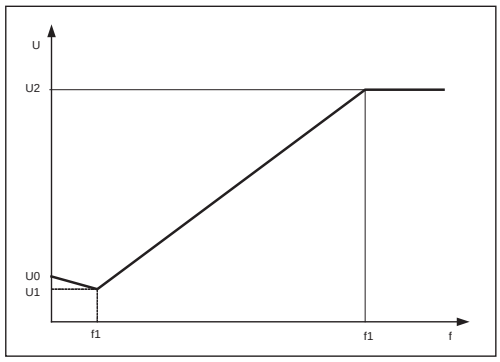
For the Open-Loop-operation additional parameters to improve the travel performance are available in the menu **Controller**.
The parameters are visible only if operation without an encoder is activated.
If it is necessary to change parameters, the parameter **Controller/UF_ED=manually** must be entered.

Parameter	Description	Value range	Factory setting
C_MOD	Controller Mode Selection of the operation mode of the frequency inverter **FOC:** Operation with encoder (Closed-Loop) **U/f:** Operation without encoder (Open Loop)	FOC U/f	FOC
UF_ED	U/f-Edit-mode Enabling the additional parameters with Open-Loop-operation (U/f)	On Off	Off
V_0	Minimum travel speed at start The setpoint for V_0 will be activated before the brake opens	0 ... 0.2 m/s	autom. preconfiguration
V_STOP	Minimum travel speed at stop The brake will be closed when the V_STOP is reached	0 ... 0.2 m/s	autom. preconfiguration
I_Kipp	Tilting protection: If the entered limit value is exceeded, the set value for the speed will be reduced.	0 ... 90A	autom. preconfiguration
U0	Voltage at speed 0 of the frequence dependent voltage characteristic	0 ... 460 V	autom. preconfiguration
U1	Start voltage of the frequency dependent voltage characteristic	0 ... 460 V	autom. preconfiguration
U2	Corner voltage of the frequency dependent voltage characteristic	0 ... 460 V	autom. preconfiguration
f1	Start frequency of the frequency dependent voltage characteristic	0 ... 125 Hz	autom. preconfiguration
f2	Corner frequency of the frequency dependent voltage characteristic	0 ... 125 Hz	autom. preconfiguration
s_FIL	Filter for measuring motor current for the slip compensation	0 ... 400 ms	autom. preconfiguration
s_COMP	Operation with slip-compensation **On:** Slip-compensation is activated **Off:** Slip-compensation is deactivated	On Off	Off
s_LIM	Maximum slip-frequency-compensation		autom. preconfiguration
U_S_MX	Maximum output voltage for the slip compensation	0 ... 300 V	80
I_IxR	Current controller, sets the minumm current with wihich the motor is energised	0 ... 90 A	Nominal current (I) of the motor
I_FIL	Filter of the motor current for the slip-compensation	0 ... 125 Hz	autom. preconfiguration
IxR_KP	P-contribution of the controller for the current	0 ... 10 V/A	autom. preconfiguration
IxR_TI	I-contribution of the controller for the current	5 ... 1000 ms	20 ms
IxR_KC	Correction factor of the controller for the current	0 ... 127	0.2
IxR_KD	D-contribution of the controller for the current	0 ... 3.0	0.0
IxR_MX	Maximum limitation of the controller	0 ... 100 %	20
IxR_MN	Minimum limitation of the controller	0 ... 100 %	0
FADE1	Fading-in and fading-out the current-control and the slip-compensation depending on the frequency of the rotating field in the stator	0 ... 125 Hz	autom. preconfiguration
FADE2	Fading-in and fading-out the current-control and the slip-compensation depending on the frequency of the rotating field in the stator	0 ... 125 Hz	autom. preconfiguration

15.9.3 Functions with Open-Loop-operation

15.9.3.1 U/f-characteristic curve

With entering the motor data in the menu "motor name plate" the parameters "U0", "U1", "f1" and "f2" will be pre-assigned. By these parameters the U/f-characteristic curve will be defined. The U/f-characteristic curve sets the motor voltage depending on the frequency of the rotating field in the stator.



U/f-characteristic curve

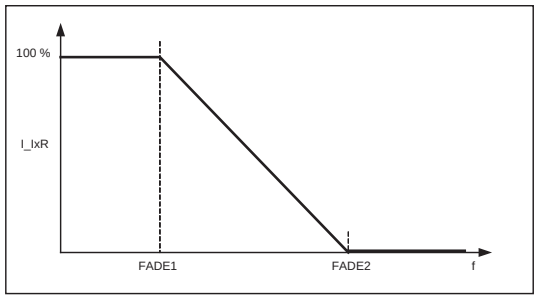
15.9.3.2 Current-control

For improving the startin, the stopping as well as the travelling with a slow speed, the motor will be energised with a minimum current (Parameter "Controller/I_IxR"). With the parameters FADE1 and FADE2 the current can be set depending on the frequency (f) of the rotating field in the stator.

f < FADE1:
If the frequency of the rotating field in the stator is less than FADE1 the motor will be energised with 100% of I_IxR.

f > FADE2:
If the frequency of the rotating field in the stator is greater than FADE2 the current I_IxR is 0

FADE1 < f < FADE2:
If the frequency of the rotating field is between FADE1 and FADE2 the current-control depends on the characteristic curve: the higher the frequency the lower is the current impression.
The characteristic curve is defined by the values for FADE1 and FADE2.



Fader-function for the current-control

15.9.3.3 Slip-compensation

With asynchronous motors the slip (difference between synchronous speed and asynchronous speed) is proportional to the load of the motor and therefore porportional to the motor current. This leads to different travel speeds in upwards and downwards direction with the same load.
Example:
The nominal speed of a motor is 1430 rpm. With empty car in downwards direction the speed is 1430 rpm. In upwards direction the speed is 1570 rpm.
The difference of 140 rpm will be settled by the slip-compensation.

The slip-compensation will be activated with the parameter **Controller/s_COMP=On**.

```
Controller
↳s_COMP  On
  ↳      On
U/F: Slip-Comp.
```

Functionality:
The motor current is recorded by a filter (parameter "s_FIL"). Proportional to the measured motor current:

- the slip-frequency will be added or subtracted to the output frequency of the U/f-characteristic curve
- voltage will be added dto the output voltage of the U/f-characteristic curve

The additional values of the slip-compensation will be limited by following parameters:

```
Controller
↳s_LIM   5          Hz
  ↳      5
U/f:Limitation slip
```

Frequency: parameter "s_LIM"

```
Controller
↳U_S_MX  80          V
  ↳      80
U/f:Max. voltage of.
```

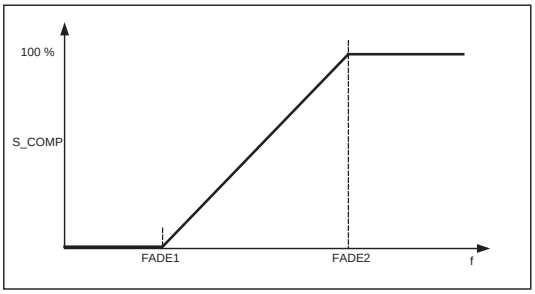
Voltage: parameter "U_S_MX"

The slip-compensation depends on the paremeter FADE1 and FADE2:

f < FADE1:
If the frequency of the rotating field in the stator is less than FADE1 the slip-compensation is switched off.

f > FADE2:
If the frequency of the rotating field in the stator is greater than FADE1 the slip-compensation is activated 100 %.

FADE1 < f < FADE2
If the frequency of the rotating field in the stator is between FADE1 and FADE2 the slip-compensation depends on the characteristic curve: the higher the frequency the higher the slip-compensation.
The characteristic curve is defined by the values for FADE1 and FADE2.
Thereby a seamless transition from current-control to slip compensation and backwards is existing.

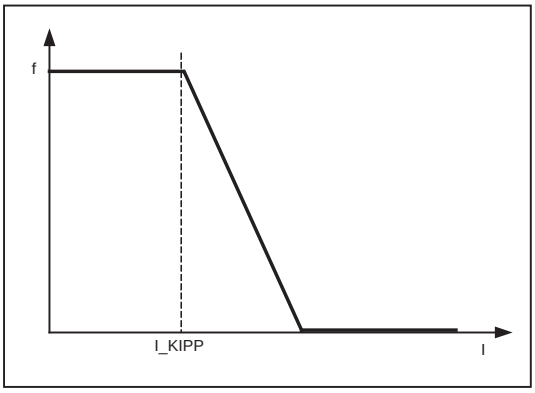


Fader-function with slip-compensation

15.9.3.4 Tilting protection

Avoids an uncontrolled tilting of the speed.

Functionality:
The motor current is recorded by a filter (parameter "s_FIL").
If the setted limit value for the current (Parameter "I_KIPP") is exceeded, the setpoint for the speed will be reduced linear to the motor current.



Tilting protection

15.9.4 Improvements with Open-Loop-operation

Information
The described possibilities for improvements apply only to parameter which are available only in the U/f-operation mode (Open-Loop).
Possibilities for improving travel curve or the signal-timing are described in the chapter "Commissioning".

15.9.4.1 Optimizing start up behavior

If the motor has a rollback during the start, the minimum current, which is impressed to the motor, too low. In this case the parameter "Controller/I_IxR" must be increased to minimise the rollback.

```
Controller
↳► I_IxR   15          A
  ↳►       18
```

15.9.4.2 Slip-compensation

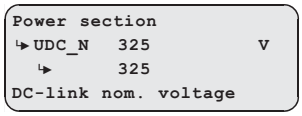
Due to the different speeds in upwards and downwards direction the different positioning travels or inexactness during the stopping can occur. By having nearly the same speed in both directions these inaccuracies can be minimised. The adjustment of the speed is carried out by the slip-compensation.

The slip-compensation will be activated with the parameter **Controller/s_COMP=On**.

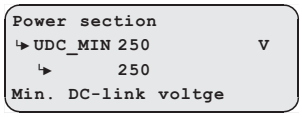
```
Controller
↳► s_COMP  On
  ↳►       On
U/F: Slip-Comp.
```

15.10 Operation with a 3-phase 230 VAC power supply

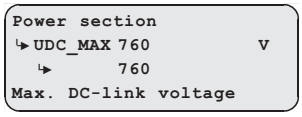
The ZETADYN 3 frequency inverter can be operated with a 3~ 230 VAC power supply.
For this purpose, it is only necessary to adapt various monitoring functions to the lower power supply.



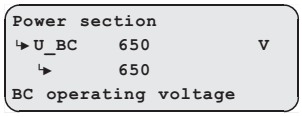
In the menu **Power section** configure the parameter **UDC_N=325 V**



In the menu **Power section** configure the parameter **UDC_MIN=250 V**



In the menu **Power section** configure the parameter **UDC_MAX=760 V**



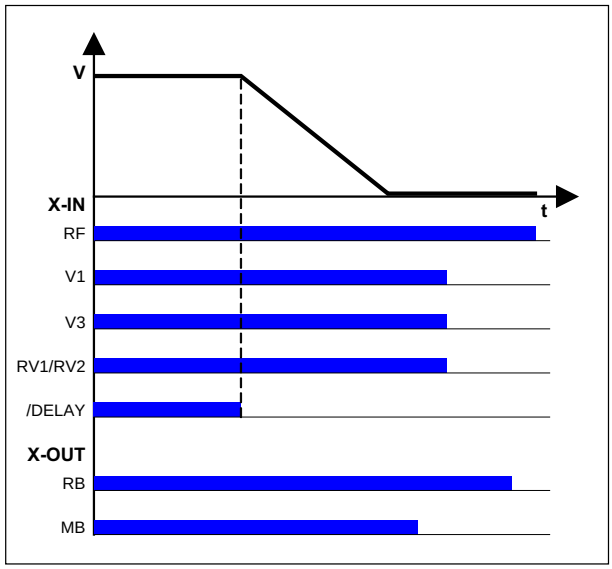
In the menu **Power section** configure the parameter **U_BC=650 V**

15.11 Controlled emergency stop in inclined elevators

If an emergency stop is implemented in inclined elevators by suddenly closing the brakes, the abrupt stop can lead to injury to passengers. To avoide this, the cabin should also be braked controlled in emergency stop.
The **/DELAY** input function is available for this.
When deactivating the input with the **/DELAY** function, the motor is delayed with the delay parameterised in the **Controller/A_MAX** menu (see fig.).

Information

At the end of the emergency stop the fault **E208 - DELAY active** is output.
A new run can only be performed after activating the **/DELAY** input function!



Controlled emergency stop

RF Controller enable
V1 Positioning speed
V3 Travel Speed
RV1/RV2 Direction default
/DELAY Delay in emergency stop
RB Controller ready
MB_Brake Mechanical brake

15.12 Travel direction counter

Information
The travel direction counter is a down counter which is counting the allowed travel direction changes with coated ropes. With the travel direction counter the frequency inverter shows an accurately timed info text when a rope change is necessary.

15.12.1 Parameters for the travel direction counter

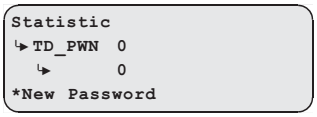
For the travel direction counter there are the following parameters, available in the menu **Statistic**.
In order to be able to use all parameters, the password **TD_PWN** must be assigned first.

Parameter	Description	Value range	Factory setting
TD_PWN	New password A number between 0 and 9999 can be used as a password	0 ... 9999	0
TD_PWC	Displays the password in coded form. If you lose the password, please contact the manufacturer.	nicht einstellbar	21689
TD_PW	Enter password.	0 ... 9999 0 = no password	0
TD_CNT	Initial value of the down counter	0.00 ... 10.00 M	0.00

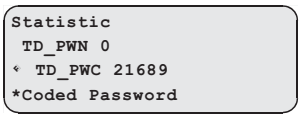
The current counter readings and the start value of the direction change counter are also available in the **INFO menu** on **page 20**.

15.12.2 Parametrization of the counter

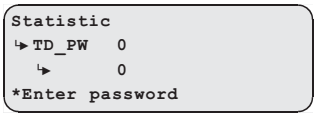
For using the travel direction counter, the following parameters have to be adjusted.



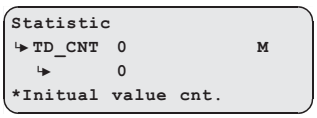
Assign new password with the parameter **TD_PWN** in the menu **Statistic**.
If there is already a password existing, you have to enter it to "TD_PW" before it can be replaced by a new password.



The coded password is shown with the parameter **TD_PWC** in the menu **Statistic**.
With the coded password Ziehl-Abegg AG can decode the original password.
For example if the owner has forgotten it.



Before you can change TD_CNT you have to enter the password to the parameter **TD_PW** in the menu **Statistic**.



Enter the maximum allowed travel directions with the parameter **TD_CNT** in the menu **Statistic**.

CAUTION!

Caution!
Before replacing the ZETADYN 3, the value TD_CNT of the actual ZETADYN 3 has to be set into TC_CNT of the new ZETADYN 3.

15.12.3 Output functions

Two special counter functions can be assigned to the digital outputs of the ZETADYN 3 when using the change of direction counter:

Parameter	Function	Explanation
Info rope	Rope-change necessary	Contact closes when the actual rope still can be used, for approx 1 year. Contact stays close until the down-counter will be reset.
TD_CNT ext.	Monostable trigger circuit	The output relay gives an impulse to the output at every travel direction change. For connecting an external counter, e.g. in the control system

15.12.4 Resetting the travel direction counter

Information

At the end of maximum change of direction ZETADYN 3 is locked and the error **"E950 TD_CNT: Drive Limit"** appears in the display.
To move the cabin into the position for a cable change after locking the inverter, ZETADYN 3 must be switched off and back on. Then a further run is possible.

After a successful cable change, the password must be entered in the **Statistics** menu and the down counter set to its new start value:

```
Statistic
↳TD_PW   0
  ↳      0
*Enter password
```

Entert he current password in the menu **Statistics**, Parameter **TD_PW** to be able reset the value of the down counter.

```
Statistic
↳TD_CNT  0           M
  ↳      0
*Initual value cnt.
```

Enter the maximum allowed travel directions with the parameter **TD_CNT** in the menu **Statistic**.

After successfully setting the down counter the number of counter resets **"TD_RES"** is increased by one.
To display the current value of TD_RES the ↩ key must be pressed in the INFO menu on page 20

16 Enclosure

16.1 Technical data ZETADYN 3BF

16.1.1 ZETADYN 3BF011 - 032

		ZETADYN				
		3BF011	**3BF013**	**3BF017**	**3BF023**	**3BF032**
Electrical data						
Mains connection voltage	[V]	3~ 180 ... 440 absolut				
Mains frequency	[Hz]	50 / 60 (±1,5 Hz)				
Network form		TT TN				
Typ. motor output (400V)	[kW]	4,6	5,5	7,5	11	14
Duty cycle at rated current and clock frequency 8 kHz	[%]	60				
Rated current for 60 % duty ratio and clock frequency 8 kHz fix	[A]	11	13	17	23	32
Rated current for 60 % duty ratio and clock frequency 12 kHz fix*	[A]	9	11	15	20	27
Rated current for 60 % duty ratio and clock frequency 16 kHz fix*	[A]	8	10	13	17	23
Max. operating current (for max. 3s)	[A]	20	24	31	42	58
Power loss at rated current, clock frequency 8 kHz and duty ratio of 60 %**	[W]	97	165	204	288	360
Power loss at rated current, clock frequency 16 kHz and duty ratio of 60 %**	[W]	137	225	304	448	570
Power losses during standstill	[W]	24			27	
Power loss in stand-by	[W]	11	11	12	12	13
Switching Freq.	[kHz]	4 ... 16				
Motor frequency	[Hz]	max. 200				
Terminal cross-section mains / motor	[mm^2]	6,0			10,0 Hülse 16,0 massiv	10,0 Hülse 10,0 massiv
Min. cable cross-section Brake-Chopper / Brake-Resistor	[mm^2]	-	2,5	2,5	2,5	6,0
Ambient conditions						
Protection class		IP20				
Ambient conditions operation	[°C]	0 ... 55 from 40°C power reduction of 1.66% / 1K temperature increase				
Relative humidity	[%]	90 / condensation prohibited				
Installation height	[m überNN]	up to 2000 above 1000m power reduction of 1.0% / 100m				
Storage and shipping temperature	[°C]	-20 ... +60				
Physical data						
Weight	[kg]	7,2			10,8	
Dimensions h x w x d	[mm]	340 x 195 x 185			340 x 245 x 185	

* *With a variable clock frequency (menu **power section/M_PWM=Auto**) a power reduction does not take place.*
** *including radio interference filter and line reactor*

16.1.2 ZETADYN 3BF040 - 074

		ZETADYN			
		3BF040	**3BF050**	**3BF062**	**3BF074**
Electrical data					
Mains connection voltage	[V]	3~ 180 ... 440 absolut			
Mains frequency	[Hz]	50 / 60 (±1,5 Hz)			
Network form		TT TN			
Typ. motor output (400V)	[kW]	19,0	24,0	30,0	37,0
Duty cycle at rated current and clock frequency 8 kHz	[%]	60			
Rated current for 60 % duty ratio and clock frequency 8 kHz fix	[A]	40	50	62	74
Rated current for 60 % duty ratio and clock frequency 12 kHz fix*	[A]	34	42	53	63
Rated current for 60 % duty ratio and clock frequency 16 kHz fix*	[A]	30	38	46	55
Max. operating current (for max. 3s)	[A]	72	90	112	134
Power loss at rated current, clock frequency 8 kHz and duty ratio of 60 %**	[W]	445	550	650	750
Power loss at rated current, clock frequency 16 kHz and duty ratio of 60 %**	[W]	675	821	980	1150
Power losses during standstill	[W]	27	32		
Power loss in stand-by	[W]	13	14	16	17
Switching Freq.	[kHz]	4 ... 16			
Motor frequency	[Hz]	max. 200			
Terminal cross-section mains / motor	[mm^2]	16,0	35 inflexible 25 flexible with cable end sleeve		
Min. cable cross-section Brake-Chopper / Brake-Resistor	[mm^2]	6,0			
Ambient conditions					
Protection class		IP20			
Ambient conditions operation	[°C]	0 ... 55 from 40°C power reduction of 1.66% / 1K temperature increase			
Relative humidity	[%]	90 / condensation prohibited			
Installation height	[m über NN]	up to 2000 above 1000m power reduction of 1.0% / 100m			
Storage and shipping temperature	[°C]	-20 ... +60			
Physical data					
TT	[Nm]	-	25 mm^2=2,5 / 35 mm^2=4,5		
Weight	[kg]	10,8	23,8	24,6	24,6
Dimensions h x w x d	[mm]	340 x 245 x 185	500 x 360 x 190		

* *With a variable clock frequency (menu **power section/M_PWM=Auto**) a power reduction does not take place.*

16.1.3 ZETADYN 3BF110 - 180

		ZETADYN	
		3BF110	**3BF180**
Electrical data			
Mains connection voltage	[V]	3~ 180 ... 440 absolut	
Mains frequency	[Hz]	50 / 60 (±1,5 Hz)	
Network form		TT TN	
Typ. motor output (400V)	[kW]	55	90
Duty cycle at rated current and clock frequency 8 kHz	[%]	60	
Rated current for 60 % duty ratio and clock frequency 8 kHz fix	[A]	110	180
Rated current for 60 % duty ratio and clock frequency 12 kHz fix*	[A]	110	180
Rated current for 60 % duty ratio and clock frequency 16 kHz fix*	[A]	93	153
Max. operating current (for max. 3s)	[A]	198	324
Power loss at rated current, clock frequency 8 kHz and duty ratio of 35/60 %**	[W]	1116	1860
Power loss at rated current, clock frequency 16 kHz and duty ratio of 35/60 %**	[W]	1706	2980
Power losses during standstill	[W]	73	80
Power loss in stand-by	[W]	33	40
Switching Freq.	[kHz]	4 ... 16	
Motor frequency	[Hz]	max. 200	
Terminal cross-section mains / motor	[mm^2]	95	
Min. cable cross-section Brake-Chopper / Brake-Resistor	[mm^2]	16,0	
Ambient conditions			
Protection class		IP10	
Ambient conditions operation	[°C]	0 ... 55	
Relative humidity	[%]	90 / condensation prohibited	
Installation height	[m über NN]	up to 2000 above 1000m power reduction of 1.0% / 100m	
Storage and shipping temperature	[°C]	-20 ... +60	
Physical data			
TT	[Nm]	25 - 30	
Weight	[kg]	57,0	63,0
Dimensions h x w x d	[mm]	1050 x 427 x 311	

* *With a variable clock frequency (menu **power section/M_PWM=Auto**) a power reduction does not take place.*

16.2 Adjustment card

"Motor name plate" menu

MOT_TYP	
n	
f	
I	
P	
cos phi	
TYP	

Encoder & BC menu

ENC_TYP	
ENC_INC	
BC_TYP	

Installation menu

V*	
MOD_n*	
__D	
__iS	
__i1	
__i2	
Q	
F	
G	

Control system menu

CONFIG	
MO_DR	
f_I01	
f_I02	
f_I03	
f_I04	
f_I05	
f_I06	
f_I07	
f_I08	
f_O1	
f_O2	
f_O3	
f_O4	
V_G1	
V_G2	
V_G3	

Monitoring menu

MOD_ST	
CO	
BR	
P1P2	
T_ENC	
T_CO	
T_BR	
S_MB	
I_MAX	
T_I_MAX	
APC	
MASK1	
MASK2	
MASK3	
MASK4	
MASK5	

Start menu

M_START	
K_START	
T_0	
T_1	
T_2	
T_3	

Acceleration menu

A_POS	
R_POS1	
R_POS2	

Travelling menu

V_1	
V_2	
V_3	
V_Z	
V_4	
V_5	
V_6	
V_7	

Deceleration menu

A_NEG	
R_NEG1	
R_NEG2	
S_DI3	
S_DI2	
S_DI1	
S_ABH	

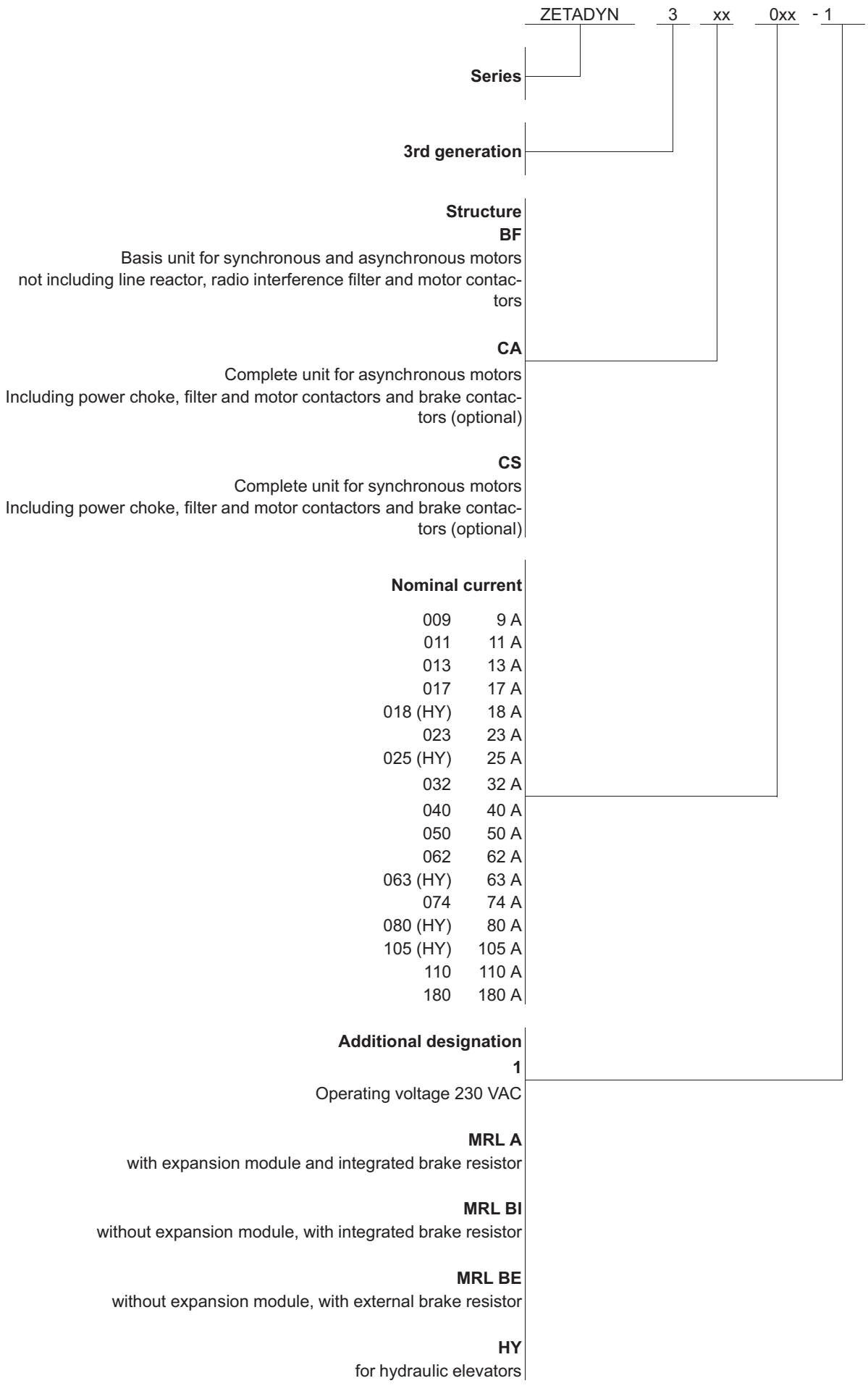
Stop menu

T_4	
T_5	
T_5b	
T_6	

Controller menu

SPD_KP	
SPD_TI	

16.3 Type designation



16.4 Part numbers

Inverter	Article-No.
ZETADYN 3BF009-1	352190
ZETADYN 3BF011	352170
ZETADYN 3BF013	352171
ZETADYN 3BF017	352172
ZETADYN 3BF023	352173
ZETADYN 3BF032	352169
ZETADYN 3BF040	352178
ZETADYN 3BF050	352179
ZETADYN 3BF062	352176
ZETADYN 3BF074	352177
ZETADYN 3BF110	352191
ZETADYN 3BF180	352192

16.5 Declaration of conformity

A-KON09_01 / 10.06.2010

ZIEHL-ABEGG

EG-Konformitätserklärung
Declaration of Conformity

Firma *Company*	**Ziehl-Abegg AG** Heinz-Ziehl-Straße D-74653 Künzelsau Germany
Produkte *Products*	**Regelgeräte für Aufzugsantriebe ZETADYN 3BF, 3CA und 3CS** *Control devices for elevator machines ZETADYN 3BF, 3CA and 3CS* 3BF011, ..., 3BF180 3BF018-HY, ..., 3BF105-HY 3CA011, ..., 3CA074 3CS011, ..., 3CS074 3CA018-HY, ..., 3CA080-HY **Die Ziffern bezeichnen die Umrichtergröße in Ampere.** *The digits represent the inverter size in amps.*

Diese Produkte sind entwickelt, konstruiert und gefertigt in Übereinstimmung mit der Richtlinie für Elektromagnetische Verträglichkeit 2004/108/EG.
These products are developed, designed and manufactured in accordance with the EMC directive 2004/108/EEC.

Folgende harmonisierte Normen sind angewandt:
The following harmonized standards are in use:

EN 12015	**Elektromagnetische Verträglichkeit – Produktfamiliennorm für Aufzüge – Störaussendung** *Electromagnetic compatibility – Product family standard for lifts – Emission*	EN 12015:2004
EN 12016	**Elektromagnetische Verträglichkeit – Produktfamiliennorm für Aufzüge – Störfestigkeit** *Electromagnetic compatibility – Product family standard for lifts – Immunity*	EN 12016:2004 + A1:2008

Eine technische Dokumentation ist vollständig vorhanden.
The complete technical documentation is available.

Diese Produkte sind im Sinne der EMV-Richtlinie nicht selbständig betreibbare Geräte. Die Einhaltung der Richtlinie ist abhängig von der korrekten Installation und Konfiguration der Geräte, einschließlich der Verwendung der vorgeschriebenen oder integrierten Netzfilter, Netzdrosseln und Bremswiderständen. Die Einbauanweisungen der Betriebsanleitung sind einzuhalten. Die Geräte sind nur für den Einsatz durch Fachkräfte geeignet.
These products are in terms of the EMC directive not to be operated as independent units. The compliance with the directive depends on the correct installation and configuration of the units, including the prescribed or integrated line filters, line chokes and brake resistors. The installation instructions of the manual have to be followed. The units are considered only for professional use.

Künzelsau, den 10.06.2010

Ziehl-Abegg AG

ppa.

Ralf Arnold
Leitung Geschäftsbereich Antriebstechnik / *Director Drive Division*

16.6 Index

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ZIEHL-ABEGG