

ZETADYN 4C

Frequency inverter

Translation of the original operating instructions



Content

| | | |
|----------|--|-----------|
| 1 | General information | 9 |
| 1.1 | Validity | 9 |
| 1.2 | Structure of the operating instructions | 9 |
| 1.3 | Target group | 9 |
| 1.4 | Structure of operating instructions | 9 |
| 1.5 | Exclusion of liability | 9 |
| 1.6 | Copyright | 10 |
| 2 | Safety instructions | 10 |
| 2.1 | General | 10 |
| 2.2 | Intended use | 10 |
| 2.3 | Pictographs | 10 |
| 2.4 | Product safety | 11 |
| 2.5 | Requirements placed on the personnel / due diligence | 11 |
| 2.6 | Commissioning | 11 |
| 2.7 | Working on device/ hazards through residual voltage | 11 |
| 2.8 | Modifications / interventions in the device | 11 |
| 2.9 | Operator's obligation of diligence | 12 |
| 2.10 | Employment of external personnel | 12 |
| 3 | Product overview | 12 |
| 3.1 | Application | 12 |
| 3.2 | Functional description | 12 |
| 3.2.1 | centrifugal masses | 12 |
| 3.2.2 | Current consumption of the ZETADYN 4 during acceleration | 13 |
| 3.3 | Service & maintenance | 13 |
| 3.4 | Transport | 13 |
| 3.4.1 | Storage duration: | 13 |
| 3.5 | Disposal & recycling | 13 |
| 4 | Mechanical installation | 13 |
| 4.1 | General notes | 13 |
| 4.1.1 | Switch cabinet installation | 14 |
| 4.1.2 | Wall installation | 14 |
| 4.2 | Dimensions / Minimum distances | 15 |
| 5 | Electrical installation | 15 |
| 5.1 | EMC-compatible installation | 16 |
| 5.1.1 | Cables motor / brake resistor | 17 |
| 5.1.1.1 | Cable length | 17 |
| 5.1.1.2 | Contacting the shielding of the motor cable on the ZETADYN 4 | 17 |
| 5.1.1.3 | Contacting of the shielding of the brake resistor line | 17 |
| 5.1.1.4 | Contacting the shielding on the motor | 18 |
| 5.1.1.5 | Contacting the shielding on the brake resistor | 18 |
| 5.1.2 | Control cables | 19 |
| 5.1.3 | STO line | 20 |
| 5.2 | Terminal positions | 21 |
| 5.3 | Wiring | 22 |
| 5.3.1 | Line laying ZETADYN 4C | 22 |
| 5.4 | Strain relief by cable ties | 22 |
| 5.5 | Protective ground connection | 23 |
| 5.6 | Mains connection (X1) | 23 |
| 5.6.1 | Network form | 23 |
| 5.6.2 | Cable cross section | 23 |
| 5.6.3 | Mains fuse | 23 |

| | | |
|----------|--|-----------|
| 5.6.4 | Type of cable | 23 |
| 5.6.5 | Connection | 23 |
| 5.7 | Line reactor-radio interference filter | 24 |
| 5.8 | Residual current operated device (RCCB) | 24 |
| 5.9 | Control transformer in the mains feed line | 25 |
| 5.10 | Motor connection (X3) | 25 |
| 5.10.1 | Cable cross section | 25 |
| 5.10.2 | Type of cable | 25 |
| 5.10.3 | Cable length | 25 |
| 5.10.4 | Connection | 26 |
| 5.10.5 | Electronic short-circuit | 26 |
| 5.11 | Motor temperature monitoring (X-MT) | 27 |
| 5.12 | Brake resistor (X 2) | 27 |
| 5.13 | Digital inputs (X-IN) | 29 |
| 5.13.1 | Connection with external power supply | 29 |
| 5.13.2 | Connection with internal power supply | 30 |
| 5.13.3 | Technical data | 30 |
| 5.13.4 | Terminal assignment X-IN | 31 |
| 5.13.5 | Binary traveling speed default | 32 |
| 5.14 | Digital outputs (X-OUT) | 32 |
| 5.14.1 | Digital outputs X-OUT | 32 |
| 5.14.1.1 | Connection X-OUT | 32 |
| 5.14.2 | Technical data X-OUT | 32 |
| 5.14.3 | Terminal assignment X-OUT | 33 |
| 5.15 | DCP / CAN interface (X-DCP, X-CAN) | 33 |
| 5.15.1 | DCP | 33 |
| 5.15.2 | CANopenLift | 34 |
| 5.16 | STO interface (X-STO) | 35 |
| 5.16.1 | Terminal assignment X-STO | 35 |
| 5.16.2 | Technical data X-STO | 35 |
| 5.16.3 | X-STO connection | 36 |
| 5.17 | Rotary encoder connection for asynchronous motors (X-ENC8, X-ENC15) | 36 |
| 5.17.1 | Technical data X-ENC8 X-ENC15 | 37 |
| 5.17.2 | Terminal assignment X-ENC8 | 37 |
| 5.17.3 | X-ENC15 pin assignment | 37 |
| 5.17.4 | Rotary encoder connection to terminal X-ENC8 | 38 |
| 5.18 | Rotary encoder connection for asynchronous motors (X-ENC15) | 38 |
| 5.18.1 | Technical data X-ENC15 | 39 |
| 5.18.2 | Pin assignment X-ENC15 for absolute value encoder with EnDat, SSI, ERN1387 and HIPERFACE interface | 39 |
| 5.19 | Rotary encoder simulation (X-ENCO) | 39 |
| 5.19.1 | Technical data X-ENCO | 39 |
| 5.19.2 | Connection X-ENCO | 40 |
| 5.20 | External 24V power supply (X-EXT) | 40 |
| 5.20.1 | Technical data | 40 |
| 5.20.2 | Connection X-EXT | 40 |
| 5.21 | Motor contactors (optional) | 40 |
| 5.21.1 | Monitoring of the motor contactors (X-CO) | 42 |
| 5.21.1.1 | Technical data internal contactor monitoring | 42 |
| 5.22 | Brakes | 43 |
| 5.22.1 | Brake release monitoring (X-BR) | 43 |
| 5.22.2 | Connection X-BR | 44 |
| 5.22.3 | Activation of the brakes without Silent Brake Module | 44 |
| 5.22.4 | Silent Brake Module | 45 |
| 5.23 | Connection suggestion ZETADYN 4C | 45 |
| 6 | Accessories | 46 |
| 6.1 | Operating terminal ZETAPAD | 46 |
| 6.1.1 | Mounting / Fastening | 47 |

| | | |
|-----------|--|-----------|
| 6.1.2 | Dimensions | 47 |
| 6.1.3 | Connection | 47 |
| 7 | Operation and parameterising | 49 |
| 7.1 | Possibilities for operation and configuration | 49 |
| 7.1.1 | Operating terminal ZETAPAD | 49 |
| 7.1.2 | Remote control via ZETAMON software | 49 |
| 7.1.3 | Remote control via the elevator controller display | 49 |
| 7.2 | Menu navigation | 49 |
| 7.2.1 | Control key functions | 50 |
| 7.2.2 | Menu and parameter navigation | 50 |
| 7.2.3 | The different operating levels | 50 |
| 7.2.4 | Meaning of the arrows appearing in the display: | 51 |
| 7.3 | Entering numerical values | 51 |
| 7.3.1 | Continuous change of a parameter value | 51 |
| 7.3.2 | Changing individual digits | 51 |
| 8 | Start-up | 52 |
| 8.1 | Switching on the ZETADYN 4 | 52 |
| 8.2 | Parameterising the ZETADYN 4 | 53 |
| 8.3 | Automatic operating-curves default | 56 |
| 8.4 | Testing the "Safe Torque Off (STO)" function | 56 |
| 8.5 | Setting the switch-off points | 57 |
| 8.5.1 | Interrupt points for the travel speeds V ₃ and V ₂ | 57 |
| 8.5.2 | Cut-off points for travel speed V ₁ | 57 |
| 8.6 | Carrying out the first test run | 57 |
| 8.7 | Optimisation of the startup and drive behaviour | 58 |
| 9 | "Safe Torque Off (STO)" function | 59 |
| 9.1 | General | 59 |
| 9.2 | Safety concept | 59 |
| 9.3 | Principle circuit diagram | 60 |
| 9.4 | Electrical connection | 60 |
| 9.5 | Notes for operation | 61 |
| 9.6 | Notes on use of motors | 62 |
| 9.7 | Deactivation of the STO function | 62 |
| 9.8 | Testing the "Safe Torque Off (STO)" safety function | 63 |
| 9.9 | Technical data | 63 |
| 10 | Serial communication | 64 |
| 10.1 | DCP (Drive Control & Position) | 64 |
| 10.1.1 | Electrical connection | 64 |
| 10.1.2 | The various DCP protocols | 64 |
| 10.1.3 | Configuring in DCP mode | 65 |
| 10.1.3.1 | Activating the DCP interface | 65 |
| 10.1.3.2 | Setting the DCP-leveling behavior | 66 |
| 10.2 | CANopen lift | 66 |
| 10.2.1 | Start-up the CAN-interface | 66 |
| 10.2.1.1 | Information for start-up | 66 |
| 10.2.1.2 | ZETADYN 4 | 66 |
| 10.2.1.3 | Bus-cable | 66 |
| 10.2.1.4 | Wiring | 66 |
| 10.2.1.5 | Electrical connection | 67 |
| 10.2.1.6 | Activating the interface | 67 |
| 10.2.1.7 | Operation modes | 67 |
| 10.2.1.8 | Command- and Statusbits of the recorder | 68 |
| 10.2.2 | Parameter | 69 |
| 10.2.2.1 | Parameter settings | 69 |

| | | |
|-----------|--|------------|
| 10.2.2.2 | Network Management Status | 69 |
| 11 | Parameter list | 70 |
| 11.1 | Basic-Level | 70 |
| 11.1.1 | Startup menu | 70 |
| 11.2 | Advanced-Level | 73 |
| 11.2.1 | LCD & Password menu | 73 |
| 11.3 | Motor name plate menu | 74 |
| 11.4 | Encoder & BC menu | 74 |
| 11.5 | Installation menu | 76 |
| 11.6 | Control system menu | 77 |
| 11.7 | Monitoring menu | 82 |
| 11.8 | Start menu | 84 |
| 11.9 | Acceleration menu | 85 |
| 11.10 | Travel menu | 85 |
| 11.11 | Decelerating menu | 86 |
| 11.12 | Stop menu | 86 |
| 11.13 | Controller menu | 87 |
| 11.14 | Parameter set 2 menu | 88 |
| 11.15 | Statistic menu | 88 |
| 11.16 | Memory Card menu | 89 |
| 11.17 | MMC-Recorder menu | 90 |
| 11.18 | Encoder adjustment menu | 92 |
| 11.19 | Safety gear menu | 92 |
| 11.20 | HW-Ident. menu | 93 |
| 11.21 | Power section menu | 93 |
| 11.22 | Menu checks | 93 |
| 11.23 | CAN menu | 94 |
| 11.24 | ZA-Intern menu | 94 |
| 11.25 | INFO menu | 95 |
| 12 | Travel options | 104 |
| 12.1 | Normal travel | 104 |
| 12.2 | Start-up and acceleration | 104 |
| 12.3 | Optimizing start up behavior | 105 |
| 12.3.1 | Damping the start-up jerk | 106 |
| 12.3.2 | Start-up variations | 106 |
| 12.4 | Optimizing the acceleration | 107 |
| 12.5 | Traveling speed defaults | 108 |
| 12.6 | Distance-dependent deceleration | 108 |
| 12.6.1 | Normal stop during path dependent deceleration | 108 |
| 12.6.2 | Arch travel with path-dependent deceleration | 109 |
| 12.7 | Time-dependent deceleration | 110 |
| 12.7.1 | Deceleration with reached traveling speed | 110 |
| 12.7.2 | Deceleration when traveling speed has not been reached | 111 |
| 12.8 | Optimizing deceleration | 112 |
| 12.9 | Crawl path optimization | 113 |
| 12.10 | Optimizing stopping | 115 |
| 12.11 | Optimizing the step alignment | 115 |
| 12.12 | Direct leveling | 116 |
| 12.13 | Readjustment | 117 |
| 12.14 | Operation in idle | 117 |
| 12.15 | Fast-start | 118 |
| 12.15.1 | Actuation | 118 |
| 12.15.2 | Monitoring functions for Quickstart | 119 |

| | | |
|-----------|--|------------|
| 13 | Emergency evacuation | 120 |
| 13.1 | Evacuation with 1-phase mains supply 230V AC | 120 |
| 13.1.1 | Parameterisation | 120 |
| 13.2 | Evacuation with UPS | 121 |
| 13.2.1 | Evacuation through UPS with optimum power | 122 |
| 13.2.2 | Evacuation through UPS with minimum power | 122 |
| 13.2.3 | Parameterisation | 123 |
| 13.3 | Improving the positioning | 125 |
| 13.3.1 | Parameterisation | 125 |
| 13.4 | Connection diagram for UPS to ZETADYN 4C | 126 |
| 13.5 | Emergency evacuation by opening the brakes | 127 |
| 13.5.1 | Monitor function | 127 |
| 14 | Error diagnosis | 128 |
| 14.1 | Travel abort and acknowledgement during malfunctions | 128 |
| 14.1.1 | Travel abort | 128 |
| 14.1.2 | Acknowledgement | 128 |
| 14.2 | LED | 129 |
| 14.2.1 | Software update | 130 |
| 14.3 | Readout the error memory | 130 |
| 14.4 | Delete error memory | 131 |
| 14.5 | Error list | 131 |
| 14.5.1 | Masc-Funktion | 131 |
| 14.5.2 | Block function | 132 |
| 14.5.3 | Notes 0xx | 132 |
| 14.5.4 | Error 1xx | 132 |
| 14.5.5 | Error 2xx | 133 |
| 14.5.6 | Error 3xx | 134 |
| 14.5.7 | Error 4xx | 137 |
| 14.5.8 | Error 5xx | 138 |
| 14.5.9 | Error 7xx | 142 |
| 14.5.10 | Error 8xx | 142 |
| 14.5.11 | Error 9xx | 143 |
| 14.5.12 | Information texts | 145 |
| 14.6 | Operating modes of the ZETADYN 4 | 145 |
| 14.7 | Frequent startup problems | 146 |
| 14.8 | Automatic parameter check (APC) | 147 |
| 14.9 | Automatic parameter diagnostics (APD) | 147 |
| 15 | Energy saving | 148 |
| 15.1 | ZETADYN 4 standby function | 148 |
| 15.1.1 | Activate Standby 1 or Standby 2 mode | 148 |
| 15.2 | Power Feedback Unit (PFU) | 149 |
| 15.2.1 | Stand-by operation of the power feedback unit | 149 |
| 15.2.1.1 | Activation of stand-by mode | 149 |
| 15.2.1.2 | Electrical connection stand-by mode | 150 |
| 15.2.1.3 | Power feedback unit in connection with automatic emergency evacuation. | 150 |
| 16 | Special functions | 152 |
| 16.1 | Changing the Clock frequency | 152 |
| 16.1.1 | Fixed presetting of the clock frequency (Menu Power section/M_PWM=Fix f_PWM) | 152 |
| 16.1.2 | Automatic adjustment if the clock frequency (Menu Power section/M_PWM=Auto) | 152 |
| 16.2 | Rotary encoder calibration | 152 |
| 16.2.1 | Load-free alignment SSI-Encoder | 153 |
| 16.2.2 | Load-free alignment EnDat-Encoder | 156 |
| 16.2.3 | Checking the load-free alignment of the SSI- & EnDat-encoders | 157 |
| 16.2.4 | Rotary encoder calibration with closed brake | 158 |
| 16.2.5 | Alignment absolute encoder type ERN1387 | 160 |

| | | |
|-----------|--|------------|
| 16.2.6 | Error messages during absolute value encoder calibration | 161 |
| 16.3 | Safety Brake | 161 |
| 16.4 | Reset | 163 |
| 16.5 | Memory card | 164 |
| 16.5.1 | Software update | 164 |
| 16.5.1.1 | Software update with the ZETAPAD operating terminal | 164 |
| 16.5.1.2 | Software update without the ZETAPAD operating terminal | 165 |
| 16.5.1.3 | Error flash code during a software update | 166 |
| 16.5.2 | Saving parameters | 167 |
| 16.5.3 | Loading parameters | 167 |
| 16.5.4 | Saving parameters lists, printer lists and error lists | 168 |
| 16.5.5 | Performing measurements | 168 |
| 16.5.6 | Saving configurations | 168 |
| 16.5.7 | Loading configurations | 169 |
| 16.6 | Checking the motor phases | 170 |
| 16.7 | Field weakening | 170 |
| 16.8 | Open loop operation (operation without encoder) | 171 |
| 16.8.1 | Activate operating mode for open loop operation | 171 |
| 16.8.2 | Parameters for open loop operation | 171 |
| 16.8.3 | Functions with Open-Loop-operation | 172 |
| 16.8.3.1 | U/f-characteristic curve | 172 |
| 16.8.3.2 | Current-control | 172 |
| 16.8.3.3 | Slip-compensation | 173 |
| 16.8.3.4 | Tilting protection | 174 |
| 16.8.4 | Improvements with Open-Loop-operation | 175 |
| 16.8.4.1 | Optimizing start up behavior | 175 |
| 16.8.4.2 | Slip-compensation | 175 |
| 16.9 | Operation with a 3-phase 230 VAC power supply | 175 |
| 16.10 | Controlled emergency stop in inclined elevators | 176 |
| 16.11 | Travel direction counter | 176 |
| 16.11.1 | Parameters for the travel direction counter | 176 |
| 16.11.2 | Configuring the travel direction change counter | 177 |
| 16.11.3 | Configuring a preallocated travel direction change counter | 177 |
| 16.11.4 | Output functions | 178 |
| 16.11.5 | Resetting the travel direction counter | 178 |
| 16.11.6 | Restore the counter reading from the absolute value encoder | 178 |
| 16.12 | Self-monitoring of the brakes according to EN81-A3 | 179 |
| 16.12.1 | Activation of the self-monitoring | 179 |
| 16.12.2 | Activation of the ZETADYN lock in case of a malfunctioning brake circuit | 179 |
| 16.12.3 | Function test of the self-monitoring | 179 |
| 16.13 | Autotune function | 180 |
| 16.14 | Support with acceptance test | 182 |
| 16.14.1 | Rotary encoder test | 182 |
| 16.14.2 | Motor temperature test | 182 |
| 16.14.3 | Testing of the protection device according to EN81-A3 | 183 |
| 16.14.3.1 | Powerless drifting of the cabin from the floor | 183 |
| 16.14.3.2 | Travel with maximum acceleration from floor | 183 |
| 16.14.4 | Capture device test | 184 |
| 16.14.5 | Driving ability test | 185 |
| 16.14.6 | Motor brakes test | 186 |
| 16.15 | Electronic name plate | 186 |
| 17 | Enclosure | 188 |
| 17.1 | Technical data ZETADYN 4C | 188 |
| 17.1.1 | ZETADYN 4C011 - 032 | 188 |
| 17.2 | Adjustment card | 189 |
| 17.3 | Brake resistor allocation | 190 |
| 17.4 | Type designation | 190 |
| 17.5 | Part numbers | 190 |

| | | |
|------|---------------------------------|-----|
| 17.6 | Declaration of conformity | 191 |
| 17.7 | Certificates | 195 |
| 17.8 | Index | 201 |

1 General information

1.1 Validity

These operating instructions apply to:
Frequency inverter from the series: ZETADYN 4C
from software version 4.46

1.2 Structure of the operating instructions

These operating instructions help you to work safely on and with the frequency inverter ZETADYN 4C. They contain safety instructions that must be complied with as well as information that is required for failure-free operation of the frequency inverter.

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

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

1.3 Target group

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

1.4 Structure of operating instructions

The operating instructions have a systematic structure. The order of the individual chapters corresponds to the order of the work steps for first time installation of the frequency inverter.

The operating instructions contain the following information:

- Device description
- Mechanical and electrical installation
- Accessories
- Operation and parameterising
- Start-up
- "Safe Torque Off (STO)" function
- Parameter list
- Drive options and special functions
- Evacuation mode
- Diagnostic
- Software ZETAMON
- Enclosure



1.5 Exclusion of liability

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

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

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

Symbols description

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

1.6 Copyright

These operating instructions contain copyright protected information. The operating instructions may be neither completely nor partially photocopied, reproduced, translated or put on data medium without previous explicit consent from ZIEHL-ABEGG SE. Infringements are liable for damages.
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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 4C 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 ZETADYN 4 is liable for any personal harm or material damage arising from non-intended use!

2.3 Pictographs

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

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



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 SE. These parts were specifically designed for the device. There is no guarantee that parts from non-original sources are designed and manufactured in correspondence with load and safety requirements.

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

2.9 Operator's obligation of diligence

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

In particular, the operator must ensure that

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

2.10 Employment of external personnel

Maintenance and service work are frequently carried out by external employees who often do not recognize the specific situations and the thus resulting dangers.

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

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

3 Product overview

3.1 Application

The ZETADYN 4C is a field-oriented Frequency inverter for speed control of three-phase motors developed for use in elevator machines.

The frequency inverter is equipped with a microprocessor control. This tracks the motor through time and distance-restricted programs that are selected using the superordinate elevator control system. The use of IGBT modules and pulse width modulation with variable switching frequency enables low-noise operation of the motor. The user interface, interfaces and software adapted specially to lift technology enable easy installation and start-up of the frequency inverter.

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 provides an AC mains with variable frequency and variable voltage. The size of the voltage and frequency depends on the selected travelling speed and the load to be operated. The motor is operated optimally in all operating points by using field-orientated control. This provides every required torque almost without delay. The full rated motor torque is already available at standstill (speed 0). All speed curves are driven in a speed-controlled and load-independent manner. The field-orientated control enables very accurate compliance with the specified travel curve over the whole speed range. The closed loop control can be used up to a speed of 4 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).

3.2.1 centrifugal masses

In order to reduce the acceleration current, all additional inertia weights are to be removed. Solid hand wheels are to be replaced with plastic or aluminium hand wheels.

However, please note that the removal of the inertia weights may cause an imbalance.

3.2.2 Current consumption of the ZETADYN 4 during acceleration

When selecting the ZETADYN 4, 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 ZETADYN 4 can be loaded with up to 180% of the reference current for up to 10 s. 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:

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

3.3 Service & maintenance

These jobs must be completed during the recurrent maintenance work:

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

3.4 Transport

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

3.4.1 Storage duration:

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

Storage duration:

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

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

New formation:

To reform, the ZETADYN 4 needs to be connected to reduced voltage for ca. 1 hour (230 VAC at L1 / L2).

3.5 Disposal & recycling

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

4 Mechanical installation

4.1 General notes

The ZETADYN 4C frequency converter is a closed compact device that is designed for wall mounting in the machine room or lift shaft. It can also be installed in the switch cabinet but adequate cooling must be provided in this case (see chapter "Switch cabinet installation").



Danger!

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

Before installation

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

During installation

- Mount the device in a torsion free conditions
- Installation position: vertical, connection terminals (X1, X2, X3) at bottom; no horizontal assembly
- Mount the frequency inverter so that it is isolated
- Prevent drilling chips, screws and other foreign bodies from reaching the interior of the frequency inverter
- Maintain the stated minimum clearances to ensure unobstructed cooling- air feed as well as unobstructed outgoing air discharge (see fig. "Minimum clearances")

Ambient conditions

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

4.1.1 Switch cabinet installation

CAUTION!

Caution!

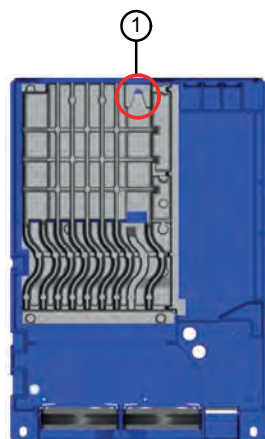
The frequency inverter is designed for wall mounting in the machine room or elevator shaft. Adequate cooling must be ensured for assembly in the switch cabinet. The power loss of the frequency inverter (see chapter "Technical Data") must be taken into account here.

The specified installation position and the minimum distances must be observed when assembling in the switch cabinet.

4.1.2 Wall installation

The ZETADYN 4C is mounted on the wall using a 3-point fastening.

- ▷ Attach fastening screw for the upper fastening point.



1 Upper fastening point

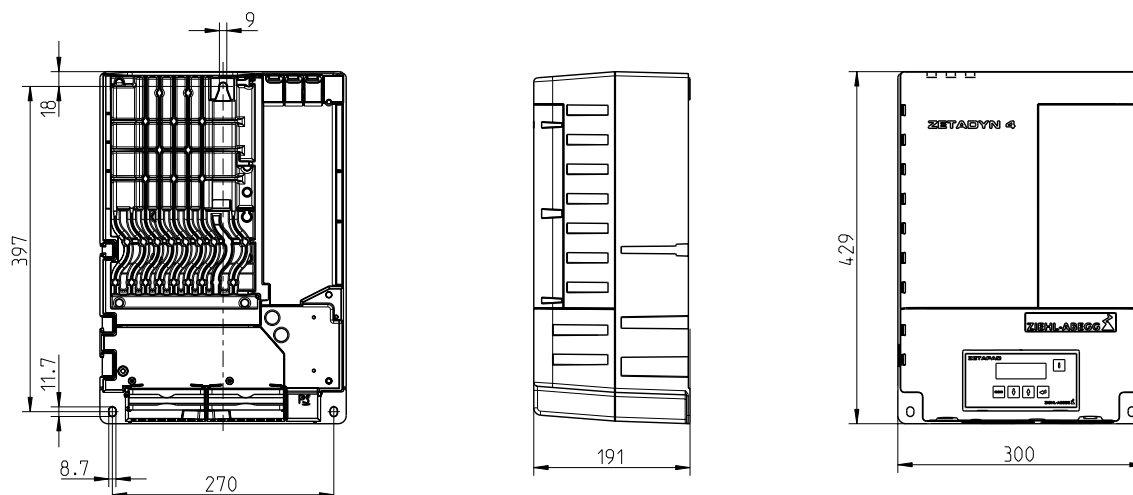
- ▷ Hang the ZETADYN 4C on the upper fastening point.
- ▷ Mark the positions of the lower fastening points.



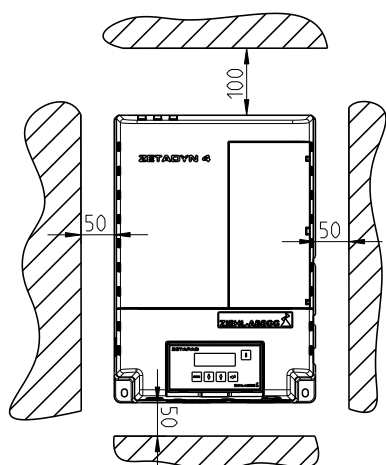
2 Lower fastening points

- ▷ Drill the fastening holes (the ZETADYN 4C can be moved to the side and must not be removed).
- ▷ Fix the ZETADYN 4C with one screw each at the lower fastening points.

4.2 Dimensions / Minimum distances



ZD4C01M0
 Dimensions ZETADYN 4C in mm



ZD4C01M0
 Minimum distances ZETADYN 4C in mm

5 Electrical installation



Danger!

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



Danger!

It is not permitted to operate the ZETADYN 4C with the housing covers removed, as exposed live parts are present inside the frequency inverter. Failure to observe this provision can lead to serious injury.



Caution!

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

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

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

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 frequency inverter corresponds to the following standards:

- EN 12015:2004 Electromagnetic compatibility – Product family standard for lifts, escalators and moving walks – Emission
- EN 12016:2004 + A1:2008 Electromagnetic compatibility – Product family standard for lifts, escalators and moving walks – Immunity

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

- Use only shielded cables for motor and brake chopper or brake resistor connections
- Max. motor line length is 25 m
- Wind unshielded cables of brake resistor type BR11-A around 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 (inputs and outputs, rotary encoder cable, etc.) must be connected to earth potential on the inverter side
- Use shielded lines in the switching cabinet also
- Do not twist shielding for connections; use a suitable shield connection system
- Run the control cables and the encoder cables separate from the power cables
- Provide connected inductances (brakes, motor contactors) with suppressors
- Feed the power supply of the motor contactors through the mains filter of the lift control



Information

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



Toroidal core BR11-A

5.1.1 Cables motor / brake resistor

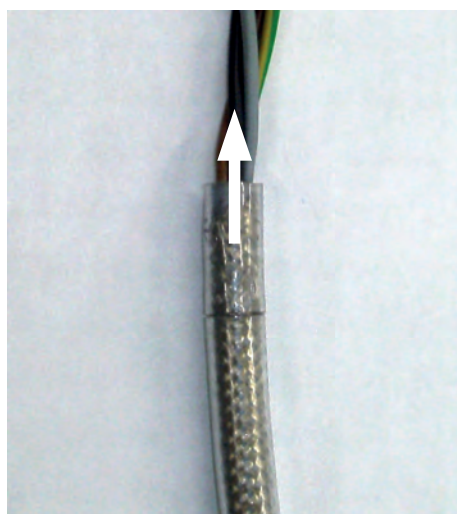
5.1.1.1 Cable length

Motor line: the maximum line length is 25 m.
Brake resistor line: the maximum line length is 5 m.

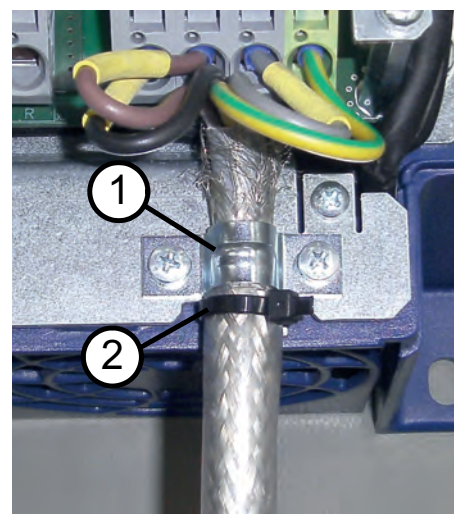
In the case of a supply line > 25 m (motor line) or > 5 m (brake resistor line), it is no longer possible to guarantee compliance with **DIN EN 12015** (Electromagnetic compatibility – Emission) and **DIN EN 12016** (Electromagnetic compatibility – Immunity).

5.1.1.2 Contacting the shielding of the motor cable on the ZETADYN 4

On the ZETADYN 4, the shielding of the motor line must be connected to earth potential with the clip provided (see fig.).



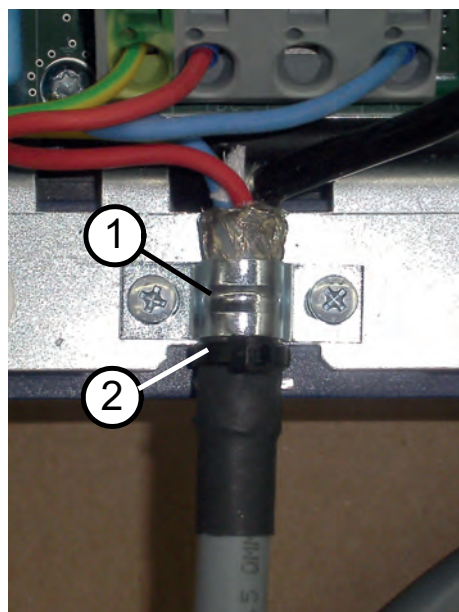
Remove the sheath



1 Clip
2 Cable tie for strain relief

5.1.1.3 Contacting of the shielding of the brake resistor line

On the ZETADYN 4 and the brake resistor, the shielding of the brake resistor line must be connected to earth potential with the clip provided (see fig.).



EMC connection, brake resistor line
1 Clip
2 Cable tie for strain relief

5.1.1.4 Contacting the shielding on the motor

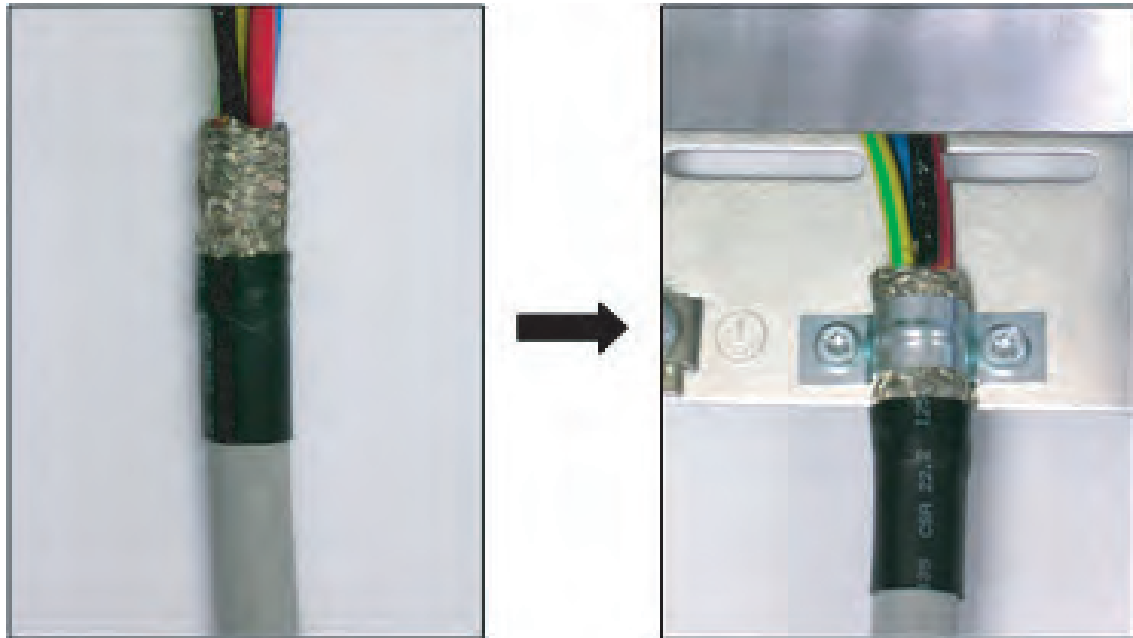
Connect the shielding on the motor side to the PE junction that is located directly on the motor housing.

For prefabricated motor lines from ZIEHL-ABEGG SE, 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.

5.1.1.5 Contacting the shielding on the brake resistor

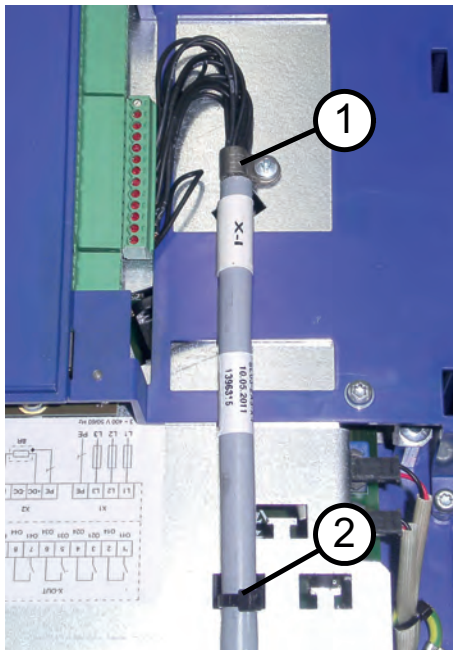
On the brake resistor the shielding must be connected with earth potential with the clip provided (see fig.).



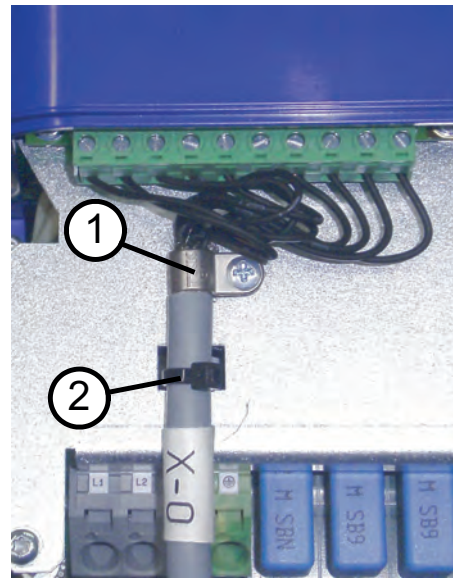
EMC-connection brake resistor

5.1.2 Control cables

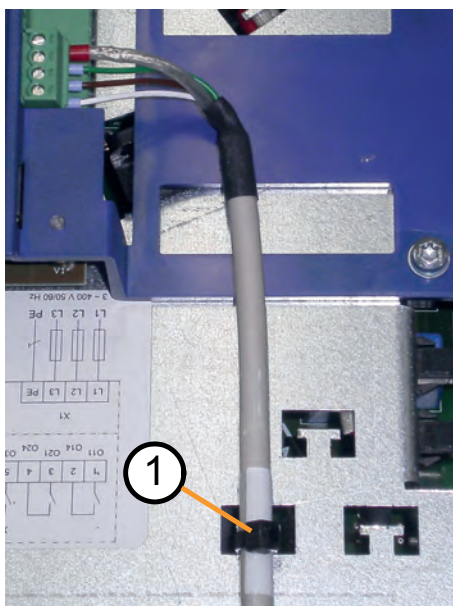
The shields of the control cables (digital inputs and outputs, DCP) must be connected to earth potential on the converter side. Earth clips are available in the ZETADYN 4 for this (see fig.).



Shielding digital inputs line
 1 Earthing clip
 2 Strain relief by cable ties



Shielding digital outputs line
 1 Earthing clip
 2 Strain relief by cable ties



Strain relief DCP line
 1 Strain relief by cable ties

5.1.3 STO line

For the STO signals, it is possible to use separate jacketed cables or a protected routing. Shielded lines must be used in each case. The shield must be placed on both sides. The shielding of the STO lines must be connected to earth potential over a large area on the inverter side. Earthing clips are provided in the ZETADYN 4 for this (see fig.).

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

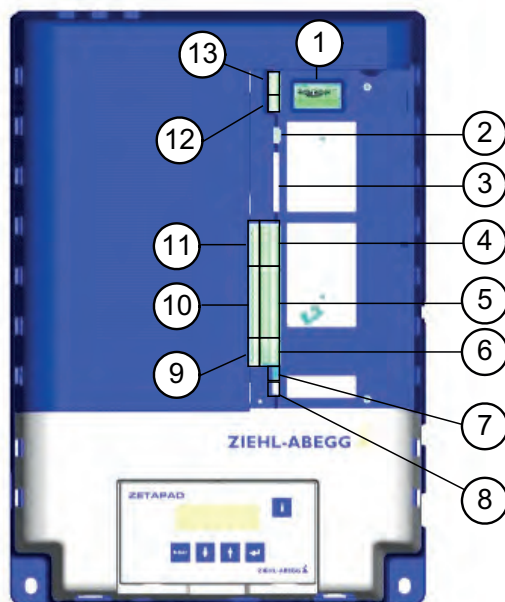


For example, STO line shielding can be performed using the pre-assembled connecting lead L-SL-xx-HX-ZA4-STO (see chapter "STO interface (X-STO)")

1,2 Earthing clips

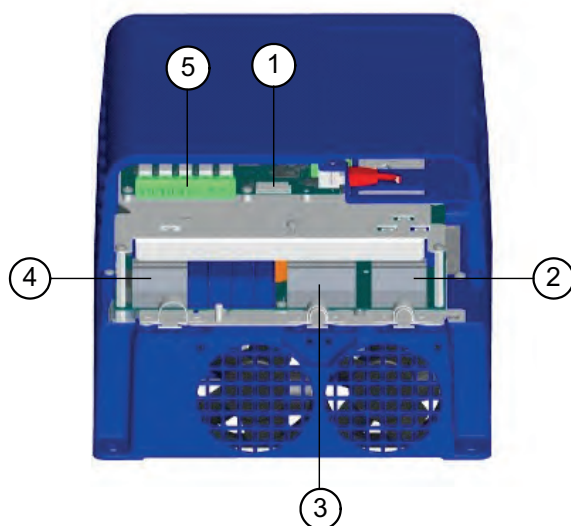
3 Strain relief by cable ties

5.2 Terminal positions



Terminal positions top

- 1 X-STO Safe Torque Off
- 2 X-MT motor temperature monitor
- 3 X-ENC15 rotary encoder SUB-D
- 4 X-ENC8 rotary encoder
- 5 X-IN digital inputs
- 6 X-CAN CAN
- 7 J1 terminating resistance CAN line
- 8 X-PAD ZETAPAD
- 9 X-DCP DCP
- 10 X-MON input monitor functions
- 11 X-ENCO rotary encoder simulation
- 12 X-AN analogue inputs
- 13 X-EXT external 24V voltage supply



Front terminal positions

- 1 X-MMC memory card
- 2 X3 motor
- 3 X2 brake chopper / brake resistor
- 4 X1 line
- 5 X-Out digital outputs

5.3 Wiring

The frequency inverter is fitted with clips and recesses to feed the different lines into the ZETADYN 4C. The table and figures below show their allocation and positions.

| | |
|---|---------------------------------------|
| Power line, X-OUT line | Recess at bottom left |
| Motor cable | Clip, recess bottom right |
| Brake resistor cable | Clip, second recess from bottom right |
| X-DCP, X-IN, X-ENC8, X-CAN, X-MON, X-ENC8 lines | Recess bottom right |

5.3.1 Line laying ZETADYN 4C



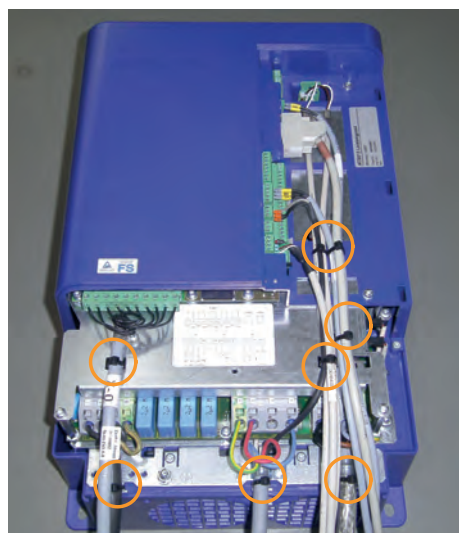
Line laying front
 1 Power line, X-OUT line
 2 Protective earth connection
 3 Brake resistor cable
 4 Motor line, X-DCP, X-IN, X-ENC8, X-CAN, X-MON, X-ENC8 lines

5.4 Strain relief by cable ties



Information

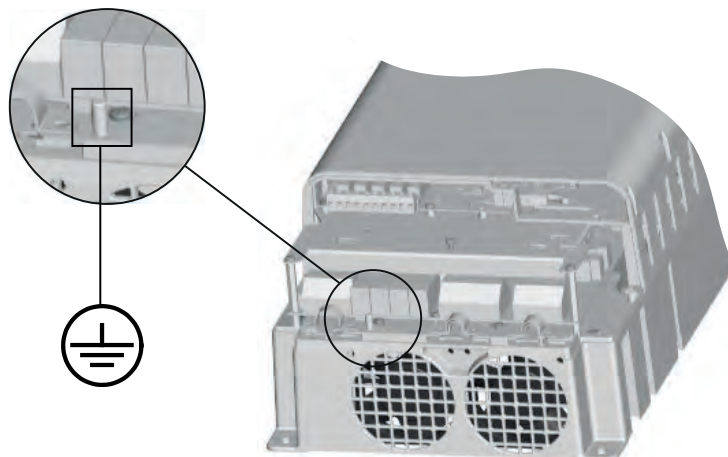
A cable tie must be attached to all lines for strain relief (see fig.).



Strain relief by cable ties

5.5 Protective ground connection

In accordance with the defined networks in DIN EN 60990, the frequency inverter has a leakage current > 3.5 mA and must therefore be permanently connected. In accordance with EN 50178, item 5.2.11 and 5.3.2.1, the PE conductor connection must have a cross-section of at least 10 mm². In the case of PE conductors < 10 mm², an additional PE conductor must be connected. The cross-section must correspond at least to the cross-section of the PE conductor on the connecting lead. M6 threaded bolts are available on the ZETADYN 4 for connecting the PE conductors (see fig.).



Protective earth conductor connection ZETADYN 4C

5.6 Mains connection (X1)



Danger!

Before connecting to mains you have to check if the technical Data on the rating plate of the ZETADYN 4 are according to the required connecting values.

5.6.1 Network form

The mains filter and ZETADYN 4 are designed for use in an earthed supply system. Permissible network forms are:

- TN network
- TT network



Information

The line filter and ZETADYN 4 are unsuitable for use in the IT network!

5.6.2 Cable 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.

5.6.3 Mains fuse

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

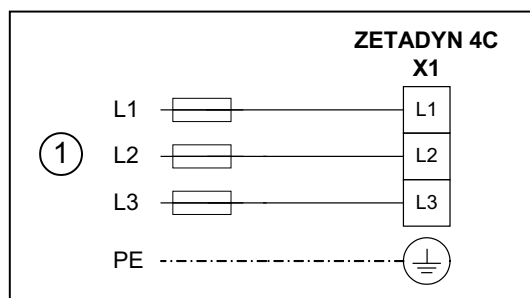
5.6.4 Type of cable

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.

5.6.5 Connection

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.



Line connection ZETADYN 4C
 1 Mains 3~ 400V/PE/50Hz

5.7 Line reactor-radio interference filter

The line reactor and radio interference filter integrated into the device ensures compliance with the product series standards listed below:

- 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

5.8 Residual current operated device (RCCB)

Frequency inverters of the ZETADYN type require no RCD circuit breaker for operation.

The output of the ZETADYN C is monitored by an electronic short-circuit protection. On detecting a short-circuit current at the output of the ZETADYN (and thus negligible impedance between the phase and a body or the protective earth of the circuit or a protective earth of the operating medium in the case of an error) the output current is switched off within a time of <math><20 \mu\text{s}</math>. On condition that the potential equalisation for the ZETADYN and the motor was performed according to the valid standards (VDE -Part 540:2012-06 and DIN EN 50178:1997), this behaviour is sufficient for the automatic switch off in case of an error demanded by VDE 0100-

If an RCD circuit breaker is required for special reasons (e.g. fire protection), an all current-sensitive RCD circuit breaker type B must be used. For maximum operational reliability Ziehl-Abegg recommends the use of an RCD circuit breaker with reference fault current 300 mA for fire protection according to regulation VdS 3501.



Information

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

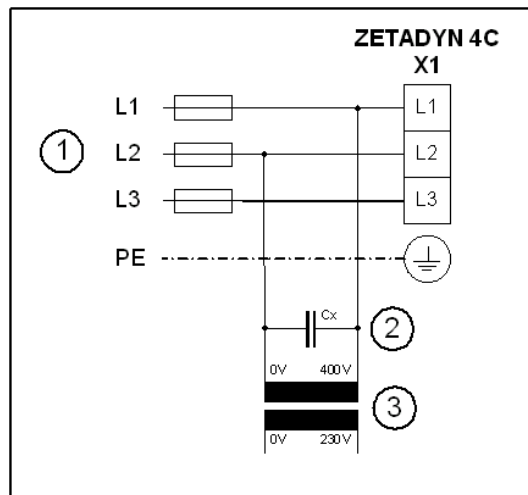
5.9 Control transformer in the mains feed line

CAUTION!

Caution!

When using a control transformer in the ZETADYN 4'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 Capacitor
- 3 Control transformer

Recommended capacitor types for Cx:

- Epcos Typ B2583210 μ F/640V-AV
- Capacitors for motor start-up with the following data: 10 μ F/450 VAC

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

5.10 Motor connection (X3)

5.10.1 Cable cross section

The line cross-section must be specified dependent on the motor's current and the ambient conditions (e.g. temperature, wiring method) in accordance with DIN VDE 0298-4.

5.10.2 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.
 Rated voltage U₀ / U: 450 / 750 VAC

5.10.3 Cable length

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.

5.10.4 Connection



Danger!

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

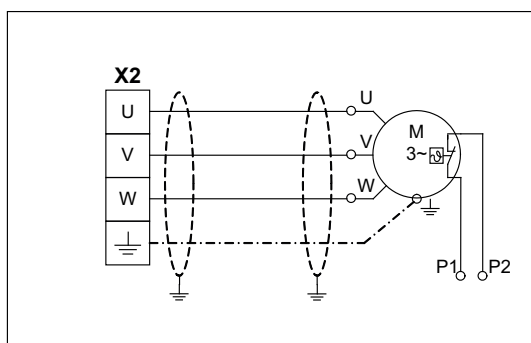
The motor connection is designed with spring contact terminals. To avoid damage to the connection terminals and to ensure a safe contact, a suitable screwdriver must be inserted into the terminals as far as it will go to fully open them when connecting cables.



Danger!

When operating the motor with a rotary encoder, the line to the motor must be connected on the motor and inverter side phase-correct: U -> U / V -> V / W -> W.

Never swap the connection; not even if the rotary direction of the motor is false!! If the motor phases are swapped, motor control is generally not possible. This can lead to jerky movements or uncontrolled acceleration of the motor.



Connection asynchronous motor / synchronous motor

5.10.5 Electronic short-circuit



If emergency evacuation is performed by opening the brakes, the motor windings are short-circuited by a self-activating electronic short-circuit to prevent uncontrolled acceleration of the lift. The short-circuit generates a speed-dependent brake torque which is sufficient in most cases to limit the lift speed to a safe value.



Information



- The electronic short-circuit is also active when there is no operating voltage on the ZETADYN 4.
- Please contact Ziehl-Abegg if you want to switch off the electronic short-circuit.

CAUTION!

When operating synchronous motors from other manufacturers, make sure that they can be operated with the electronic short-circuit and that manual emergency evacuation with short-circuited motor windings is permissible.

5.11 Motor temperature monitoring (X-MT)



Information

The X-MT terminal is a standard part of the ZETADYN 4C frequency inverter.



Information

The detection of over temperature of the motor doesn't cause a drive interruption. The current drive will be completed.

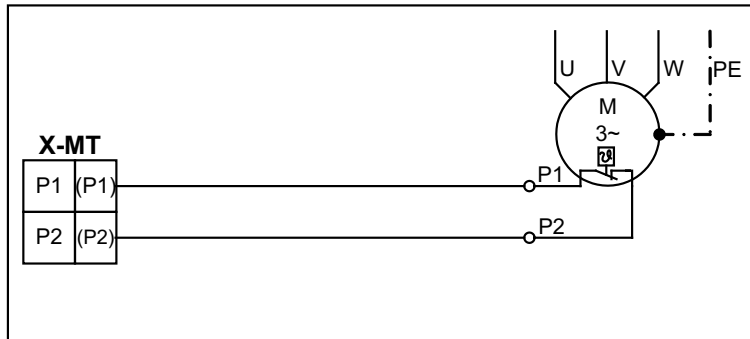
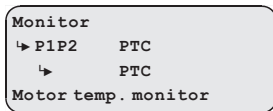
If an over temperature of the motor will be detected at stop, there is no further drive possible.

The temperature monitoring is carried out according to IEC 61800-5-1:2003-02 (switching point at 3500 Ω)

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 menu **Monitoring/P1P2!**



Temperature monitoring connection
 () terminal designation of connector



Information

If you do not use the temperature monitor and install a PTC thermistor (PTC in accordance with DIN 44082) or a KTY84-130 temperature sensor, you must switch off the temperature monitor (**Monitors/P130P1=Off**). Short-circuiting of the inputs P130 and P1 is detected as an error by the ZETADYN 4C.

5.12 Brake resistor (X 2)

CAUTION!

Caution!

**An existing temperature monitor absolutely must be connected to the ZETADYN 4!
 The brake resistor or the brake chopper may be burnt out in the event of a fault!**

CAUTION!

Caution!

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

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 type

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



Information

The pre-assembled line of the BR11-A does not have double insulation. You can order a retrofit kit for routing in accordance with VDE 0100-400 from ZIEHL-ABEGG SE. Item number: 357260

Cable length

The maximum line length is 5 m.

When lines over >5 m are used, compliance with **DIN EN 12015** (electromagnetic compatibility – electrical interference) and **DIN EN 12016** (electromagnetic compatibility – noise immunity) is no longer guaranteed.

If the 11 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.

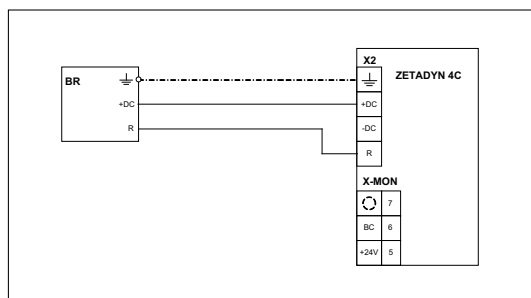
A shielded, self-extinguising cable is required for this.

Brake-Resistor connection

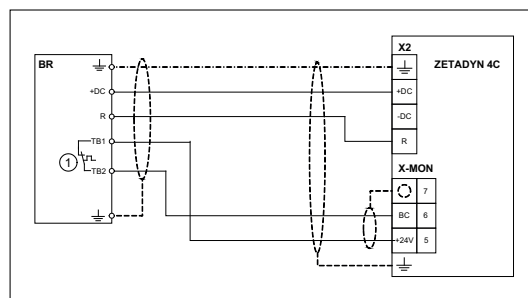


Information

The brake resistor of the BR11-A type has no temperature monitor.

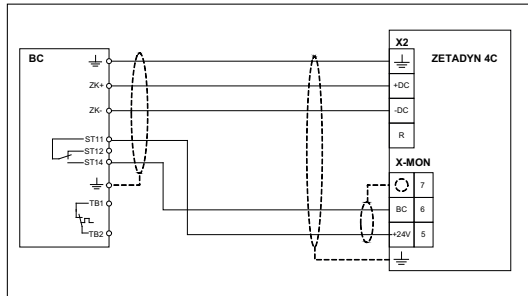


Connection of BR11-A / BR 14-A



Installation position BR17 / BR25 / BR50 / BR100
 1 Max. contact load: 5 A / 250 VAC

Brake-Chopper connection



Connection of BC25 / BC50 / BC100
 1 Max. contact load: 5 A / 250 VAC

5.13 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 power supply in the ZETADYN 4.



Information

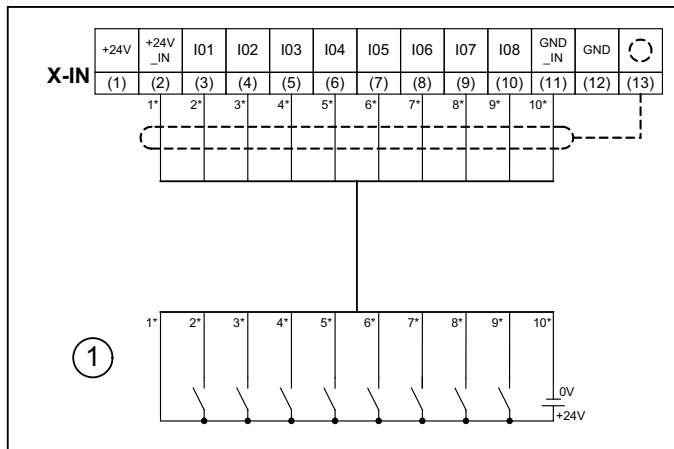
If the digital inputs are connected to the internal or external voltage supply, all inputs, i.e. also CO1, CO2, BR1, BR2, BR3, BR4 and BC are supplied by the internal or external voltage supply. The bridges +24V/+24V_IN and GND/GND_IN are wired on the plug at the factory so that the internal voltage supply is active. If the +24V/+24V_IN and GND/GND_IN terminals are not bridged, it is not possible to supply the inputs with the internal voltage supply.



Information

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

5.13.1 Connection with external power supply



Connection of digital input with external power supply

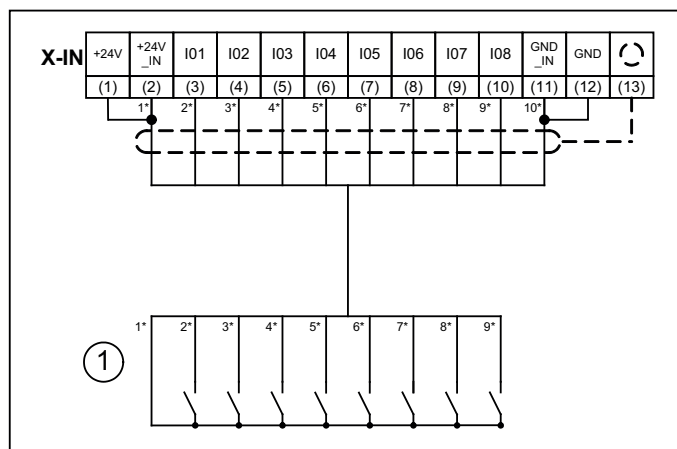
- 1 Modulation
- () terminal designation of connector
- * Wire number of the pre-assembled connecting lead X-I



Information

When using the external power supply the bridges between the terminals +24V / +24V_IN and GND / GND_IN the pre-assembled control cable X-I are not required. These must be removed!

5.13.2 Connection with internal power supply



Connection of digital input with internal power supply

1 Modulation

() terminal designation of connector

* Wire number of the pre-assembled connecting lead X-I



Information

When using the internal power supply a bridge must be inserted between the terminals +24V / +24V_IN and between GND / GND_IN. These bridges are already integrated into the pre-assembled X-I cable.

The cable GND_IN (wire no.10) is not required. This must be removed from the connection terminal both on the converter side and the control side and insulated.

CAUTION!

Caution!

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

5.13.3 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. 8 mA |
| Clamping range | max. 1,5 mm ² |

5.13.4 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\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 | V4* |
| 21:ST_IO | RF | V1 | V2 | V3 | VZ | RV1 UP | RV2 DOWN | Free* |
| 24:CSILVA | RF | BIN0 | BIN1 | BIN2 | Free | RV2 DOWN | RV1 UP | Free* |
| 25: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* |
| 31:KL_IO | V4 | V1 | V2 | V3 | VZ | RF+RV1 | RF+RV2 | PARA*2 |
| 32: S_SMART | RF* | V1* | LZ* | V3* | V5* | RV1 UP* | RV2 DOWN* | Free* |

* 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

**5.13.5 Binary traveling speed default
 Standard (CONFIG=15:ZA_BIN)**

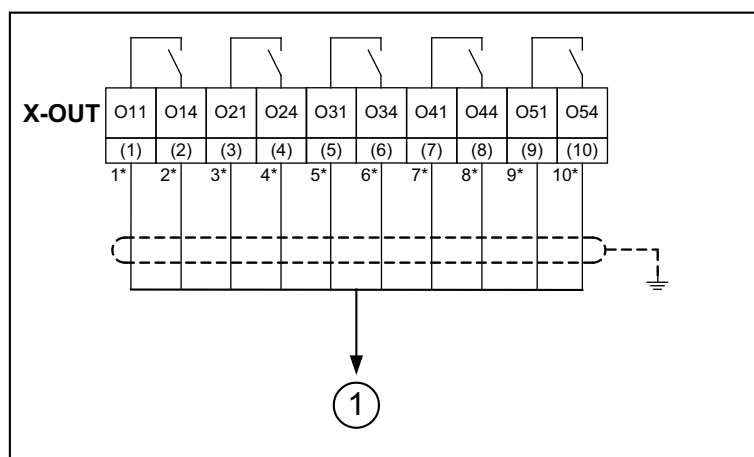
| Travel speed V_3 | Binary inputs | | |
|------------------|---------------|------|------|
| | BIN2 | BIN1 | BIN0 |
| - | 0 | 0 | 0 |
| V1 | 0 | 0 | 1 |
| V2 | 0 | 1 | 0 |
| V3 | 0 | 1 | 1 |
| V4 | 1 | 0 | 0 |
| V5 | 1 | 0 | 1 |
| V6 | 1 | 1 | 0 |
| VZ | 1 | 1 | 1 |

5.14 Digital outputs (X-OUT)

5.14.1 Digital outputs X-OUT

The connection terminal X-OUT is equipped with 5 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.

5.14.1.1 Connection X-OUT



Connection of the digital outputs X-OUT

1 Modulation

() terminal designation of connector

* Wire number of the pre-assembled connecting lead X-O

5.14.2 Technical data X-OUT

| | |
|-------------------------|--------------------------|
| Short-circuit-proof | no* |
| Min. switching capacity | 5 mA / 12 VDC |
| Max. switching capacity | 2 A / 250 VAC |
| Cable cross section | max. 2,5 mm ² |

CAUTION!

Caution!

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

5.14.3 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 | O51-- 54 |
| 00:Free | Fault* | MB_Brake* | MotContact* | V < V_G1* | STO-Info* |
| 01:ZA_IO | Fault | MB_Brake | MotContact | V < V_G1 | STO-Info |
| 03:BP_IO | Fault | MB_Brake | MotContact | V < V_G1 | STO-Info |
| 08:KN_IO | Fault | MB_Brake | MotContact | V < V_G1 | STO-Info |
| 11:NL_IO | Fault | MB_Brake | MotContact | V < V_G1 | STO-Info |
| 13:SS_IO | Fault | MB_Brake | MotContact | V < V_G1 | STO-Info |
| 15:ZA_BIN | Fault | MB_Brake | MotContact | V < V_G1 | STO-Info |
| 16:WL_IO | Fault | MB_Brake | MotContact | V < V_G1 | STO-Info |
| 21:ST_IO | Fault | MB_Brake | MotContact | V < V_G1 | STO-Info |
| 24:CSILVA | Fault | MB_Brake | MotContact | V < V_G1 | STO-Info |
| 25:S+S | MotContact | MB_Brake | V=O | Fault | STO-Info |
| 27:MAS_BIN | Fault | MB_Brake | MotContact | Off* | STO-Info |
| 30:KS_IO | Fault | MB_Brake | MotContact | V < V_G1 | STO-Info |
| 31:KL_IO | fault | MB_Brake | MotContact | EVAC.DIR | STO-Info |
| 32: S_SMART | Fault | MB_Brake | MotContact | SD | STO-Info |

* The function of the outputs can be changed

5.15 DCP / CAN interface (X-DCP, X-CAN)

As an alternative to the conventional wiring, it is possible to actuate the ZETADYN 4 via DCP or CANopen lift (see chapter "Serial communication").

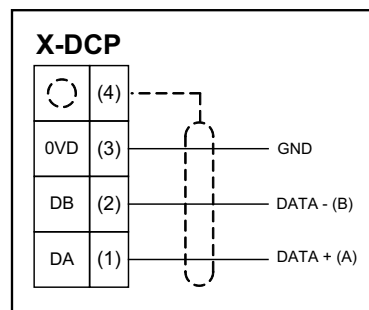


Information

The X-DCP and X-CAN terminals are standard parts of the ZETADYN 4C.

5.15.1 DCP

- Use a shielded cable for the connection. The shielding must be grounded on the inverter side.
- Make the connection between the ZETADYN 4 and the control without additional terminal points.
- The maximum line length is 50 m.



DCP connection

() terminal designation of connector

☞ For more detailed information on DCP, see chapter "Serial communication/DCP (Drive Control & Position)"

5.15.2 CANopenLift

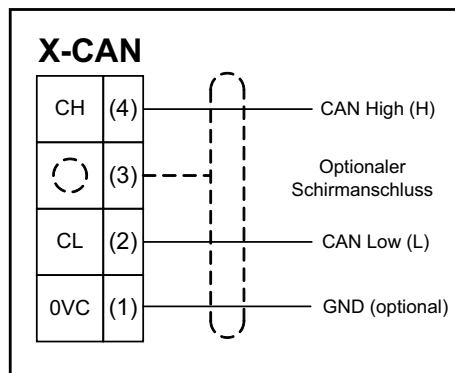
- A shielded bus-cable is not needed, but the data wires should be twisted.
- The installation takes place in line structure. The separate devices are connected to the bus with short branch lines.
- The bus should be terminated with a terminating resistor of 120 - 150 Ohms, at both ends of the bus.
-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

CAUTION!

Caution!

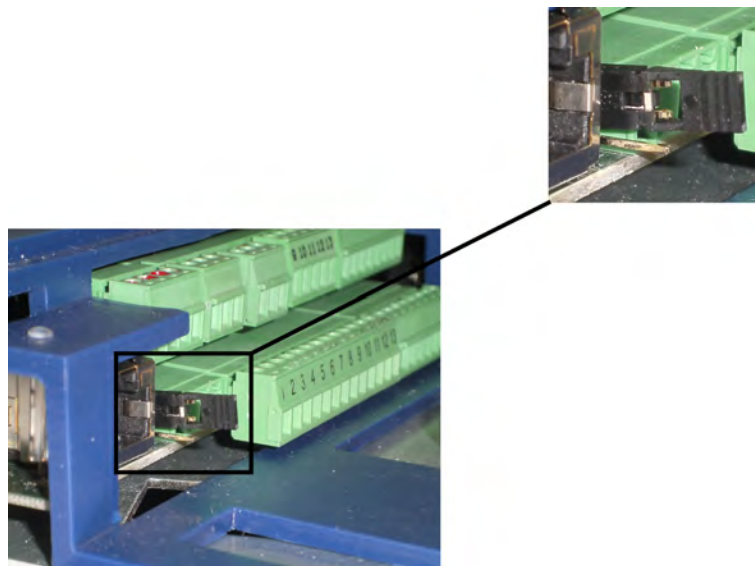
Incorrectly wired connections can destroy the electrical / electronic components. Electrostatic discharges can be hazardous to the electronic components and lead to errors in the software.

The bus cable is connected by the interface X-CAN at the ZETADYN 4



Connection CAN

To activate the terminating resistance, the jumper at terminal J1 must be plugged to the top two pins (see fig.).



👉 For more detailed information on CANopen lift, see chapter "Serial communication/CANopen lift"

5.16 STO interface (X-STO)

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

- Separate relays must be used for every input for switching the STO signals (two-channel activation).
- When wiring the STO signals, short-circuits and external shorts must be ruled out on power lines and terminal points because the internal diagnostics of the ZETADYN 4C does not detect any short-circuits on the power lines:
 - Outside the switch cabinet, the STO line must be permanently laid (fixed) and protected against external damage (e.g. cable duct, armoured tube or similar). If separate jacketed cables are used for the STO_A and STO_B signals, the cables must not be laid with protection (according to ISO 13849-2).
 - Air and creep distances of at least 2 mm must be kept between the STO_A, STO_B and +24V_STO signals according to EN81 (e.g. at terminal points).
 - Terminals which comply with a CENELEC or IEC standard must be used.
 - The wiring technique must be compliant with DIN EN 60204-1.
- External shorts must be ruled out in the exciter voltage of the relays that actuate the STO inputs (end of the safety chain).
- Supply cables (power cable, motor cable) and STO cables must be laid separately.
- The maximum line length is 50 m.
- Use shielded lines.

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

- Safe disconnection between coil and contacts according to EN 60664-1 or equivalent standard.
- Rating according to the technical data of the STO inputs (typ. 24 V/12 mA). It is recommended to use relays with hard gold-plated contacts.
- Switching voltage min. 60 VDC



Danger!

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

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

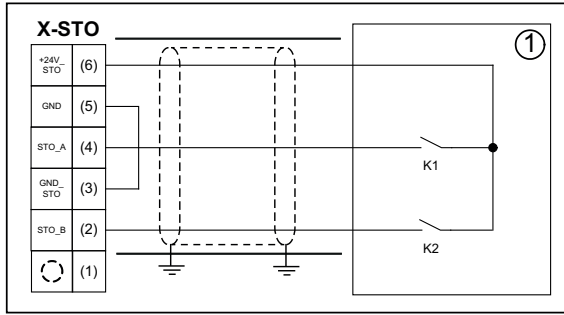
5.16.1 Terminal assignment X-STO

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

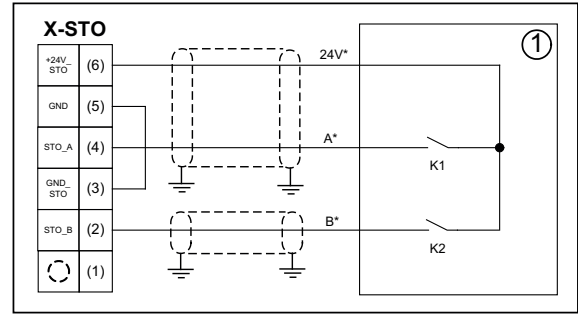
5.16.2 Technical data X-STO

| | |
|-------------------------------|--|
| Voltage range | 0...30 VDC |
| Switching level LOW / HIGH | 0 V < LOW < 3 VDC 15 V < HIGH < 30 VDC, typical: 24 VDC |
| Current consumption at 24 VDC | typ. 12 mA per input |
| Connection terminal range | min. 0,25 mm ² ...max. 2,5 mm ² |

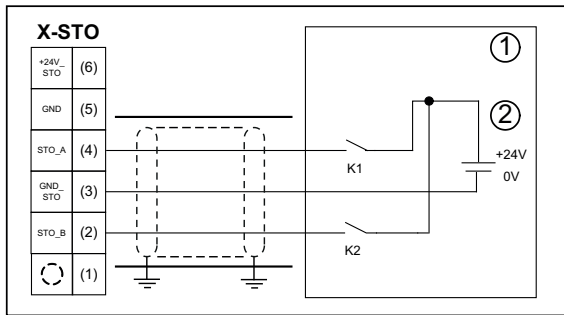
5.16.3 X-STO connection



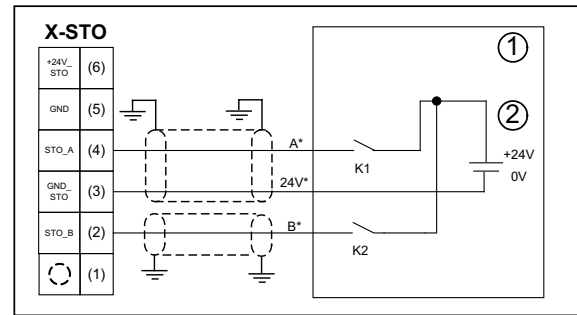
Connection with internal 24 V voltage and protected routing
 1 Modulation



Connection with internal 24 V voltage using two separate jacketed cables
 1 Modulation
 * Wire designation of the pre-assembled connecting lead L-SL-xx-HX-ZA4-STO



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



Connection with external 24 V voltage using two separate jacketed cables
 1 Modulation
 2 External voltage source SELV/PELV
 * Wire designation of the pre-assembled connecting lead L-SL-xx-HX-ZA4-STO



Danger!

When using an external 24 V voltage source to activate the STO inputs, only SELV/PELV voltages may be used.
 When using an external 24 V voltage source and the pre-assembled connecting leads L-SL-xx-HX-ZA4-STO, the plug pin allocation must be adapted according to the figure. In this case, remove the 24V marking on the wire because this is now used for the ground connection.

5.17 Rotary encoder connection for asynchronous motors (X-ENC8, X-ENC15)

X-ENC8: 8-pole terminal strip for connection with single wires

X-ENC15: 15-pole SUB-D jack for connection with Sub-D plug



Information

At the X-ENC 15 connection, both incremental encoders for asynchronous motors and absolute encoders for synchronous motors can be connected.



Information

- Use a shielded cable for the connection.
- Attach the shielding on the frequency inverter corresponding to the terminal or pin assignments.
- Make the connection between the ZETADYN 4 and the rotary encoder without additional terminal points.

CAUTION!

Caution!

The pin assignment of the SUB-D socket X-ENC15 is not standardised. When using encoders from other manufacturers, make sure that these have the same contact assignment and an interface with identical specification.

CAUTION!

Caution!

Before the rotary encoder is plugged in/connected, the rotary encoder type and resolution used must be configured in the "Encoder & BC/ENC_TYPE" and "Encoder & BC/ENC_INC " menus.

```
Encoder & BC
↳ ENC_Typ TTL rect.
  ↳ TTL rect.
Encoder type
```

```
Encoder & BC
↳ ENC_INC 2048
  ↳ 2048
Encoder resolution
```

5.17.1 Technical data X-ENC8 X-ENC15

| | |
|--|--|
| Rotary encoder types | Sine encoder Incremental encoder TTL Incremental encoder HTL (X-ENC8 only) |
| Rotary 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. 1,5 mm ² |
| Max. cable length | 25 m |

5.17.2 Terminal assignment X-ENC8

| | |
|---------|---|
| A | Track A |
| /A | Track A inverse |
| B | Track B |
| /B | Track B inverse |
| +5/8V_E | +5 V power supply for sinus and TTL encoder |
| GND | Ground |
| +24V_E | +24 V power supply for HTL encoder |
| ⊘ | Shielding |

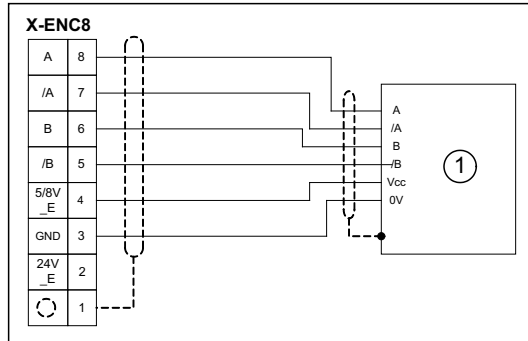
5.17.3 X-ENC15 pin assignment

| | | |
|----|--------|---|
| 1 | - | - |
| 2 | - | - |
| 3 | - | - |
| 4 | +5 V_E | +5/8V voltage supply (power supply is switched off if the rotary encoder is missing) |
| 5 | DGND | Ground voltage supply of rotary encoder |
| 6 | - | - |
| 7 | B | Analog track B |
| 8 | - | - |
| 9 | - | - |
| 10 | - | - |

| | | |
|---------|------|---|
| 11 | - | - |
| 12 | A | Analog track A |
| 13 | /A | Analog track A inverse |
| 14 | /B | Analog track B inverse |
| 15 | DGND | Ground voltage supply of rotary encoder |
| Housing | | Shielding |

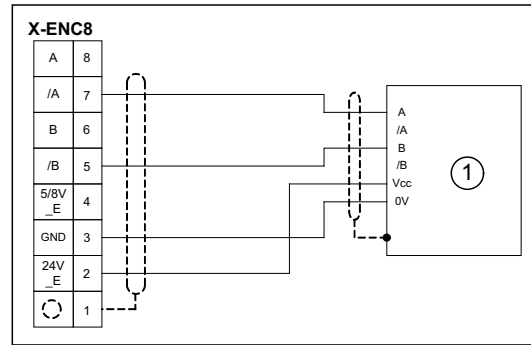
5.17.4 Rotary encoder connection to terminal X-ENC8

TTL incremental encoder (5V), sine encoder (1V_{ss})



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 incremental encoders!

- signal A ↔ input /A
- signal B ↔ input /B

5.18 Rotary encoder connection for asynchronous motors (X-ENC15)



Information

At the X-ENC 15 connection, both incremental encoders for asynchronous motors and absolute encoders for synchronous motors can be connected.

Caution!

CAUTION!

The pin assignment of the SUB-D-socket X-ENC15 is not standardised. When using encoders from other manufacturers, make sure that these have the same contact assignment and an interface with identical specification.

Caution!

CAUTION!

Before the rotary encoder is plugged in/connected, the encoder type and resolution used must be configured in the **"Encoder & BC/ENC_TYPE"** and **"Encoder & BC/ENC_INC "** menus.

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

```
Encoder & BC
↳ ENC_INC 2048
  ↳ 2048
Encoder resolution
```

5.18.1 Technical data X-ENC15

| | |
|--|--|
| Rotary encoder types | Absolute value encoder with EnDat, SSI or Hiperface interface Absolute value encoder type ERN1387 |
| Rotary 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 V _{ss} ... 1,2 V _{ss} (typ. 1V _{ss}) |
| Connection cable | Shielded twisted pair cable |
| Max. cable length | 25 m |

5.18.2 Pin assignment X-ENC15 for absolute value encoder with EnDat, SSI, ERN1387 and HIPERFACE interface

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

5.19 Rotary encoder simulation (X-ENCO)

The rotary encoder simulation transforms the signals of the rotary encoder mounted on the motor into differential signals according to ANSI standard RS422 and transmits them to the control. The resolution of the rotary encoder simulation is identical to the resolution of the rotary encoder.



Information

The X-ENCO connection is not a connection for the rotary encoder but an output for transmission of data to the control. The rotary encoder is connected to the connection X-ENC8 or X-ENC15.



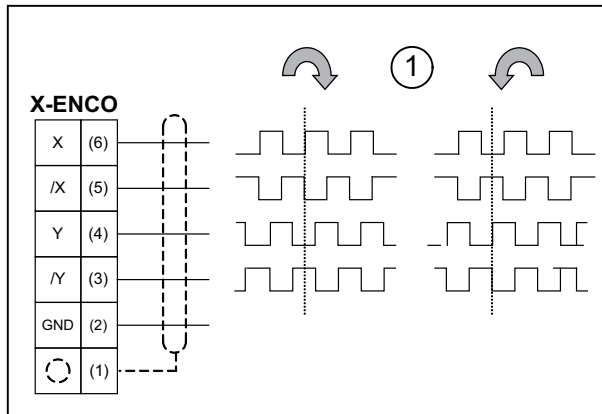
Information

As a result of the connection of an external 24 V voltage source to terminal X-EXT, the rotary encoder simulation is active even when the ZETADYN 4 is switched off.

5.19.1 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. 1.5mm ² |

5.19.2 Connection X-ENCO



Connection of rotary encoder simulation

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

5.20 External 24V power supply (X-EXT)

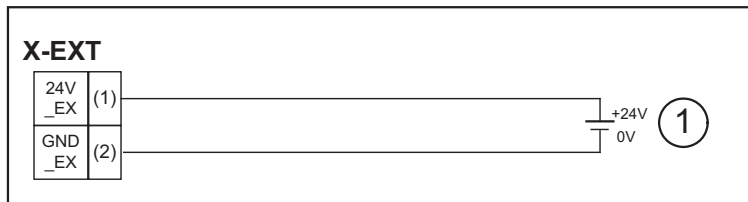
By applying an external 24 V power supply to terminal X-EXT, the following functions are active even when the ZETADYN 4 is switched off:

- Communication between control and ZETADYN 4
- Rotary encoder simulation
- ZETAPAD (parameter changes is possible)
- USB interface of the ZETAPAD

5.20.1 Technical data

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

5.20.2 Connection X-EXT



Connection external power supply

- 1 external power supply
 () terminal designation of connector

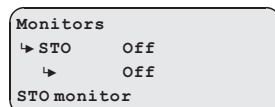
5.21 Motor contactors (optional)

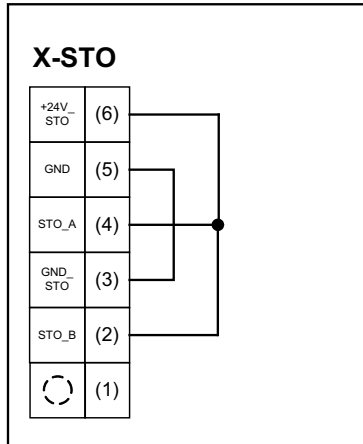


Information

The STO connection must be bridged if motor contactors are used (see fig.).
 The monitor of the STO function must also be deactivated.

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





STO connection bridged

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.

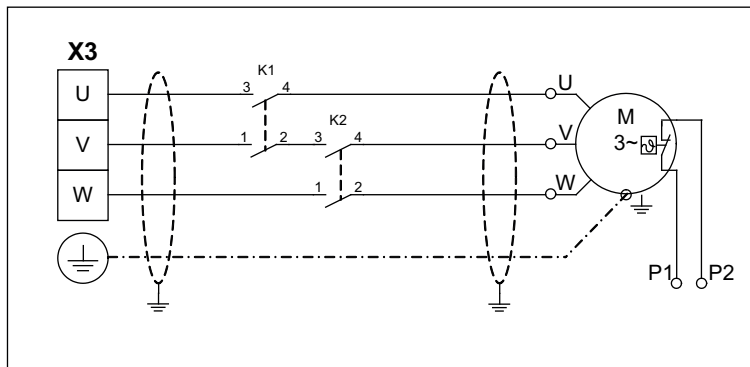
The maximum line length to the motor contactors when using non-shielded lines is **200mm**. If there is a greater distance between the contactors and ZETADYN 4, you must use shielded lines!



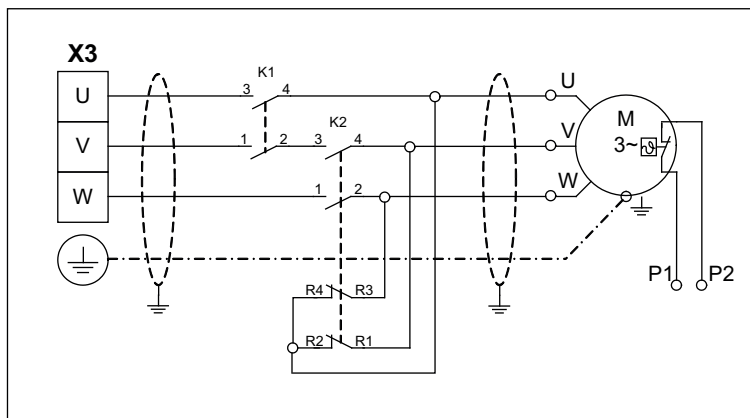
Danger!

When operating the motor with an encoder, the feed line to the motor must be connected on the motor and inverter side phase-correct: $U \leftrightarrow U / V \leftrightarrow V / W \leftrightarrow W$.

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.

5.21.1 Monitoring of the motor contactors (X-CO)



Information

The switching states of the motor contactors must be monitored according to EN 81-1. The ZETADYN 4 contactor monitoring does not substitute this monitoring of the motor contactors demanded in EN 81-1!

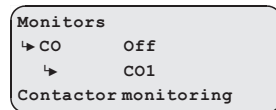
The ZETADYN 4 monitors the switching status of the motor contactors. The contactors must be applied during travel. Opening the contactors during travel (e.g. through chatter) leads to an immediate travel abort.

CAUTION!

Caution!

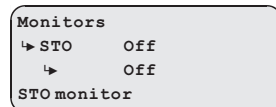
Operating gearless motors is only permissible with connected and activated contactor monitoring!

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



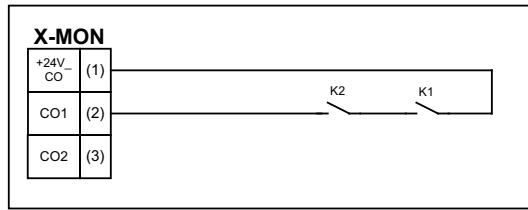
The monitor of the STO function must also be deactivated.

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

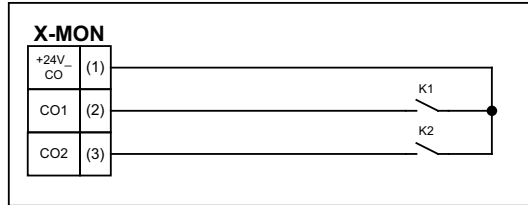


5.21.1.1 Technical data internal contactor monitoring

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



Connection internal contactor monitoring – series circuit
 1 Parameter "Monitoring/CO=CO1"
 () terminal designation of connector



Connection internal contactor monitoring – separate
 1 Parameter "Monitoring/CO=CO1&CO2"
 () terminal designation of connector

CAUTION!

Caution!

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

5.22 Brakes

5.22.1 Brake release monitoring (X-BR)



Information

The brake release monitoring serves as monitoring for redundancy and the operation status of the brakes.

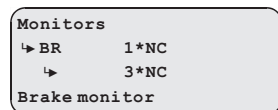
It is recommended to connect the brake air monitor to the ZETADYN 4C for optimum starting and stopping.

The monitoring conforms chapter 9.10 of EN81-1:2010 for brakes as protection for the upside traveling elevator car against overspeed.

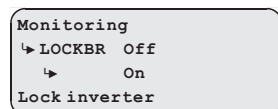
When the lock function is activated, the brake release monitoring fulfils the requirements for self-monitoring according to chapter 9.11.3 EN81-1:2010 for brake elements for protection against unintended movement of the cabin.

| | |
|-----------------------------|--|
| Monitoring voltage | +24 VDC / 8 mA |
| Contact type | Normally open contact (NO) or normally closed contact (NC) |
| Number of inputs | 4 |
| Clamping range | max. 1,5 mm ² |
| Current consumption at 24 V | typ. 8 mA |

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



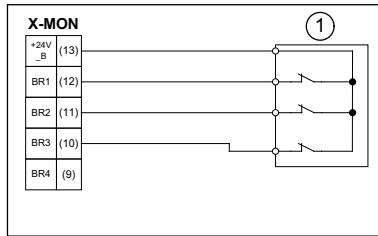
The lock function of the ZETADYN is engaged by activating the "LOCKBR=On" parameter in the menu **Monitoring**.



Activation of the parameter ensures that the ZETADYN locks on detection of a faulty brake circuit. The ZETADYN lock can only be released by setting the "Monitors / UNLOCK = On" parameter.

Activation of the parameter ensures that the ZETADYN locks on detection of a faulty brake circuit. The ZETADYN lock can only be released by setting the "Monitors / UNLOCK = On" parameter.

5.22.2 Connection X-BR



Brake release monitor connection
 1 Monitoring contacts
 () terminal designation of connector

CAUTION!

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

5.22.3 Activation of the brakes without Silent Brake Module

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.).

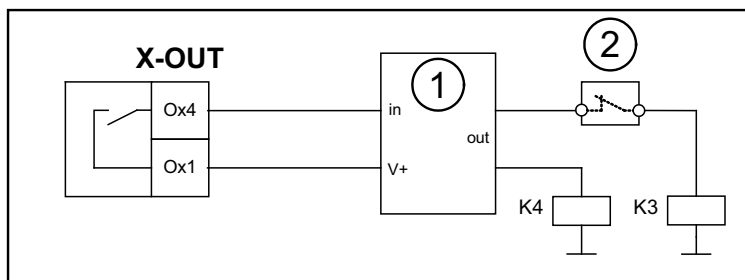


Information

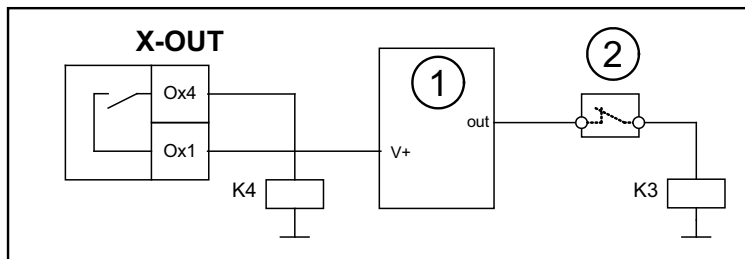
To achieve optimum travel and position behavior, the brakes must be **instantaneously** opened and closed via this contact!

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 Modulation
 2 Safety circuit



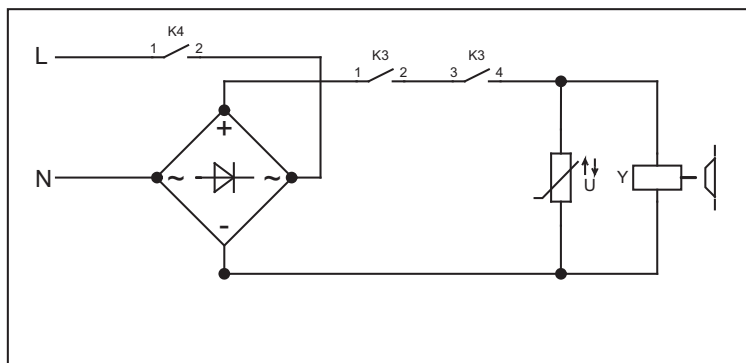
Actuating the brakes via the frequency inverter and control
 1 Modulation
 2 Safety circuit

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!



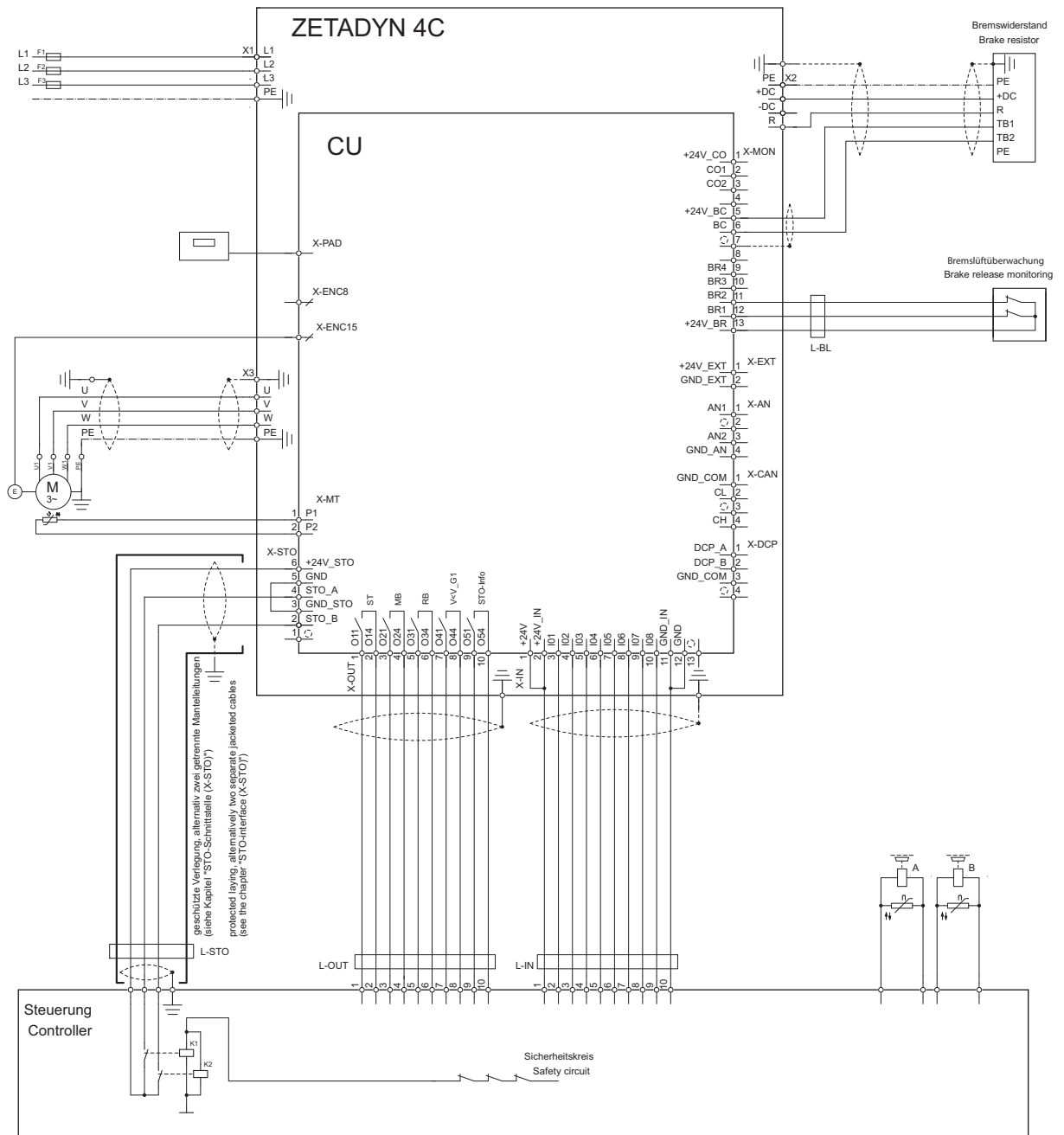
Simplified diagram for brake activation

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

5.22.4 Silent Brake Module

Information about the Silent Brake Module can be found in the operating manual for the Silent Brake Module.

5.23 Connection suggestion ZETADYN 4C



ZD4C01K2

6 Accessories

6.1 Operating terminal ZETAPAD

The ZETAPAD is an operating module independent of the ZETADYN 4. It can be used to operate and configure all ZETADYN 3 and ZETADYN 4 frequency inverters.

Remote control of the frequency inverter is feasible when a longer connection line is used.

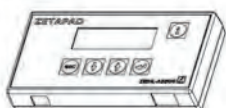
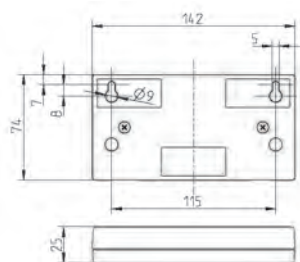
6.1.1 Mounting / Fastening

To fasten it to the ZETADYN 4, the ZETAPAD is inserted into the recess on the lid and pressed in.



The ZETAPAD can also be fixed to a magnetic base. This is done using three magnetic strips which are included. The magnetic strips are stuck into the three recesses on the bottom of the ZETAPAD.

6.1.2 Dimensions



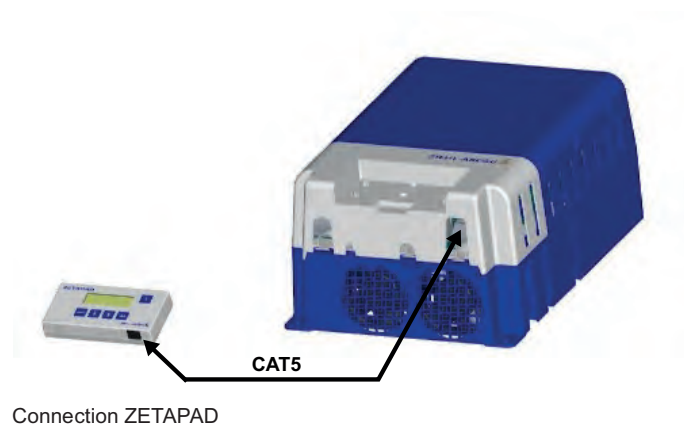
ZETAPAD dimensions

6.1.3 Connection

The connection has to be effected on the RJ45-female plug of the operating terminal and the ZETADYN 4 (X-PAD).

Connection cable

CAT5 network cable, 8-core
both sides RJ-45 plug, 8-pole
maximum line length: 50 m
line cross-section \geq AWG26



7 Operation and parameterising

7.1 Possibilities for operation and configuration

The following operations can be performed with the aid of the various operating facilities on the ZETADYN 4:

- 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 ZETADYN 4. It can be used to operate and configure frequency inverters of the ZETADYN 4 type and evacuation modules of the EVAC 4 type.

7.1.2 Remote control via ZETAMON software

When the ZETAMON software is used the ZETADYN 4 can be operated by a PC / Notebook (see chapter "ZETAMON Software").

7.1.3 Remote control via the elevator controller display

The prerequisite for this is an elevator control system which supports the DCP protocol or CANopen lift protocol as well as an existing connection between the ZETADYN 4 and the elevator control system. Please see the elevator control system operating instructions for information on operating the frequency inverter 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 Control key functions

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

7.2.2 Menu and parameter navigation

| | | |
|---------------------------|---|--|
| Main page | <pre>ZIEHL-ABEGG AG ZETADYN 4CS011-D SN: 09229587/0002 Phone: +49 794016308</pre> | - Actuate with any key |
| Menu section | <pre>ZETADYN 4 ->Startup Statistic Memory Card</pre> | - Select required menu Confirm menu selection |
| Parameter section | <pre>Startup USR_LEV Basic ->MOT_TYP SM250 n 96 rpm</pre> | Parameter selection - Confirming parameter values |
| Changing parameter | <pre>Startup ↳ MOT_TYP SM225 ↳ SM250 Motortype</pre> | - Enter / select parameter value. - Confirm value |

7.2.3 The different operating levels

The firmware of the ZETADYN 4C is divided into two operating 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  key.
- The level which is active after the controller start can be set by the parameter **LCD & Password/USR_LEV**.

7.2.4 Meaning of the arrows appearing in the display:

| | | |
|---|--------------------------|---|
| <pre>Motor-Typenschild -> Encoder & BC Anlage-daten Steuerung</pre> | → | Selecting a menus in the menu level |
| <pre>Motor-Typenschild n 128 rpm > f 18.0 Hz I 40.4 A</pre> | └ | Selecting changeable parameters in the menu |
| <pre>Anlage-Daten MOD_n* Mit D..i2 n* 94 rpm __D 0.240 m</pre> | └┘ | Selected parameter can be modified, but is blocked at the moment. The block can be implemented by assigning a password or functionally (dependent on another parameter) |
| <pre>Start T_2 1.0 s T2_real 0.8 s T_3 0.1 s</pre> | └┘ | Value / function of a parameters is only displayed for informational purposes and cannot be modified. |
| <pre>Serial-No-----01 ZETADYN 4CA013 SN:06128238/0001 3.17-1037</pre> | i Zahl | Current position (page number) in the INFO-menue |
| <pre>MMC-Recorder REC_MOD On REC_CFG 0 REC_NUM 0</pre> | <input type="checkbox"/> | The recorder for recording measurements on the memory card is activ |
| <pre>Start T_2 1.0 s T2_real 0.8 s T_3 0.1 s</pre> | ERR | Fault of the ZETADYN 4 The ZETADYN 4 must be switched off |

7.3 Entering numerical values

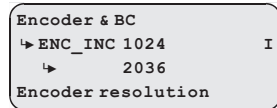
Entering numerical parameter values can be done using two different facilities:

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.

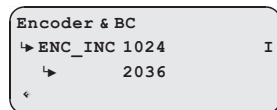


7.3.2 Changing individual digits

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

After selecting the parameter, use **▲** to 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 start-up assumes the factory settings for the digital inputs and outputs, rotary 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
- Rotary encoder connected



Information

Startup takes place in the basic level. To go to the advanced level, press the  key long (see chapter "Operation and Parameterisation / The different operating levels") or go to the **Startup** menu and set the **USR_LEV = Advanced** parameter.

```
Start-up
↳ USR_LEV Advanced
  ↳ Advanced
User level
```

8.1 Switching on the ZETADYN 4

When the mains voltage is applied, the ZETADYN 4 switches on after a self test. The display shows the following:

```
Ziehl-Abegg AG
ZETADYN 4C
SN:12345678/123
Phone +49 794016308
```

8.2 Parameterising the ZETADYN 4

If the ZETADYN 4 doesn't have preset parameters, you have to adjust the following parameters before start-up.

```
ZETADYN 4
->Startup
Statistic
Memory Card
```

Select menu **"Startup"**



```
Start-up
↳ LCD      Deutsch
↳          English
Sprache - Language
```

Select parameter **"LCD"**

Choose language

The languages German and English are integrated as standard. A third language can be loaded with the memory card.



```
Start-up
↳USR_LEV Basic
↳          Advanced
User level
```

Select parameter **"USR_LEV"**

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



```
Start-up
↳MOT_TYP SM 200
↳          SM 200
Motor
```

Select parameter **"MOT_TYP"**

Enter the operated motor type



```
Start-up
↳ n      72      rpm
↳          72
Rated speed
```

Select parameter **"n"**

Enter nominal speed of the motor



Information

A With asynchronous motors it is possible to determine the motor data automatically by means of the Autotune function of the ZETADYN 4C and to save them in the parameter memory. See the "Special functions/Autotune Function" for further information about the Autotune function.



```
Start-up
↳ f      18.0    rpm
↳          18.0
Rated frequency
```

Select parameter **"f"**

Enter nominal frequency of the motor



```
Start-up
↳ f      13.7    rpm
↳          13.7
Rated current
```

Select parameter **"I"**

Enter nominal current of the motor



```
Start-up
↳ U      360      V
↳       360
Rated voltage
```

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



```
Start-up
↳ f      5.5      rpm
↳       5.5
Rated power
```

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



```
Start-up
↳ cos phi 0.75
↳       0.75
Power factor
```

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



```
Start-up
↳ TYPE   Star
↳       Triangle
Connection type
```

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



```
Start-up
↳ ENC_TYP EnDat/SSI
↳       EnDat/SSI
Encoder type
```

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



```
Start-up
↳ ENC_INC 2048      INC
↳       2048
Encoder resolution
```

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



```
Start-up
↳ BC_TYP BR11
↳       BR11
BR/BC type
```

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



```
Start-up
↳ v*     1.00      m/s
↳       1.00
Nominal speed
```

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



```
Start-up
↳ _D     0.315      m
↳       0.400
Driving disk diam.
```

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



```
Start-up
↳ __is 1:1
↳      1:1
Suspension
```

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



```
Start-up
↳ __i1 23.00
↳      23.00
Gearbox i1:i2
```

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



```
Start-up
↳ __i2 1
↳      1
Gearbox i1:i2
```

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



```
Start-up
↳ Q 600 kg
↳   600
Nominal load
```

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



```
Start-up
↳ CONFIG 01: ZA_IO
↳         01: ZA_IO
Configuration
```

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



```
Start-up
↳ MO_DR Left
↳       Left
Motor rotation direction
```

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



```
Start-up
↳ BR Off
↳   3*NO
Brake monitor
```

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



```
Start-up
↳ P1P2 Off
↳     PTC
Motor temp. monitor
```

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



```
Start-up
↳ K_START 1.0
↳         1.0
Control vers. at start
```

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



```
Start-up
↳ SPD_KP 1.00
  ↳      1.00
Controller basic gain
```

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

8.3 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 | A_NEG | V_2 |
| R_POS1 | R_NEG1 | V_3 |
| R_POS2 | R_NEG2 | |

8.4 Testing the "Safe Torque Off (STO)" function

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

| Test step | Result |
|---|---|
| Check the state of the two inputs STO_A and STO_B at standstill of the drive (no travel signals). | In the Info menu /Start/Stop the STO_A and STO_B inputs must be marked inactive by a small dot. A large dot must be visible next to the DIAG display. |
| Trigger application of a travel command, e.g. by briefly pressing the Recover UP or DOWN button. | In the Info menu /Start/Stop the STO_A and STO_B inputs must be marked active by a large dot. A large dot must be visible next to the DIAG display. Attention: As soon as the large dots are visible at STO_A and STO_B, remove the travel command. |
| At standstill of the drive (no travel signals), bridge the normally open contact of the relay for triggering the STO_A signal so that the STO_A input is activated. | In the Info menu /Start/Stop the STO_A input must be marked active by a large dot. A large dot must be visible next to the DIAG display. After a time of approx. 1 second, the displays for STO_A and DIAG change from a large dot to a small dot (all displays marked as inactive). The ZETADYN 4 triggers the "STO-Diagnostic" error (error 960). Then remove the bridge at the relay contact again. Then reset the error by switching the line voltage off/on. |
| At standstill of the drive (no travel signals), bridge the normally open contact of the relay for triggering the STO_B signal so that the STO_B input is activated. | In the Info menu /Start/Stop the STO_B input must be marked active by a large dot. A large dot must be visible next to the DIAG display. After a time of approx. 1 second, the displays for STO_B and DIAG change from a large dot to a small dot (all displays marked as inactive). The ZETADYN 4 triggers the "STO-Diagnostic" error (error 960). Then remove the bridge at the relay contact again. Then reset the error by switching the line voltage off/on. |
| At standstill of the drive (no travel signals), bridge both normally open contacts of the relay for triggering the STO_A/STO_B signals so that both inputs are activated. | The ZETADYN 4 triggers the "STO: Travel signal missing" error (error 534) after the time specified by the T_SDLY parameter. Then remove the bridge at the relay contacts again. |

The STO safety function test should be repeated at regular intervals (e.g. annually during the TUEV inspection).

8.5 Setting the switch-off points

8.5.1 Interrupt points for the travel speeds V_3 and V_2

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

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

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

The following parameters influence the deceleration paths:

- 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 indicated in the display after confirming the change.

```
Travel
s31= 1.53m [ok]
```

To have some leeway to optimise the travel behaviour, the interrupt points should be set to a deceleration path larger than that which was calculated. Subsequent reduction of the creep path can be performed directly at the frequency inverter in the menus **Delay/S_DI3** (for V_3) and **Delay/S_DI2** (for V_2).

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_1

To prevent overshooting the flush alignment, the interrupt points V_1, dependent on the deceleration A_NEG, must be set between **2 and 5 cm** 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!

S Operating synchronous motors without encoder offset can cause uncontrolled motor movements



In synchronous motors, an encoder offset calibration must be made prior to initial travel (see chapter "Special functions/rotary encoder calibration")!

When a Ziehl-Abegg motor is purchased in connection with a frequency inverter, the offset alignment is already taken care of.

If third-party motors are used, the offset must be performed as described in the chapter "Special functions/rotary encoder calibration".

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.

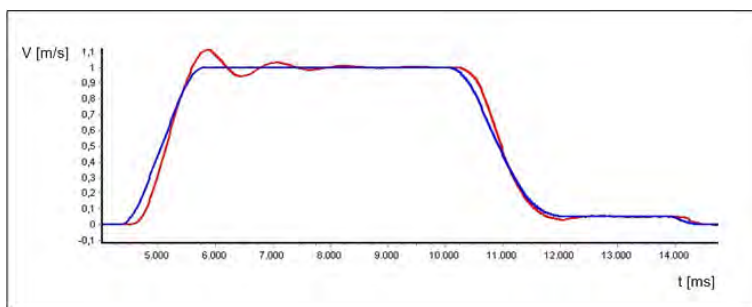
If fault messages appear, an error list is available in the "Diagnose" chapter together with the corresponding error causes

8.7 Optimisation of the startup and drive behaviour

The "SPD_KP" (amplification) parameter can be used to optimise the setting of the speed controller acting during travel. The parameter can be changed in the **Control/SPD_KP** menu.

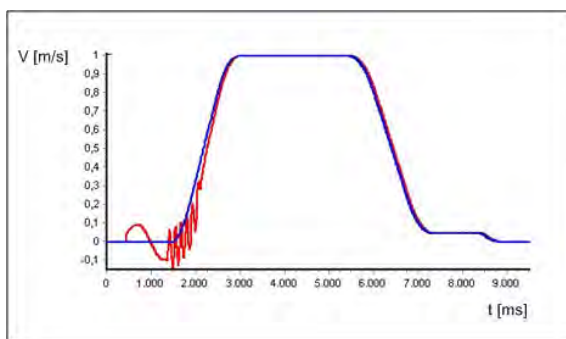
```
Control
↳ SPD_KP 1.00
  ↳      0.95
Speed controller basic
gain
```

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.

Turning away when starting up

Turning away when 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 **Controller/SPD_KP**) this can be optimised by increasing the parameter **Start/K_START**.

```
Start-up
↳ K_START 1.0
↳      3.0
Start gain
```

CAUTION!

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

9 "Safe Torque Off (STO)" function

9.1 General

The "Safe torque off (STO)" function in the ZETADYN 4C product series corresponds to the "Safe torque off (STO)" stop function in accordance with DIN EN 61800-5-2.

Activation of this function ensures that the ZETADYN 4 cannot supply any energy to the motor which can cause a torque.

The STO function allows the contactors that are usually installed between the ZETADYN 4 and motor in lifts to be omitted. The requirements in accordance with EN81-1 section 12.7.3 or EN81-2 section 12.4.1 are therefore met.

The STO function must be taken into consideration in an application-specific risk analysis by the company responsible for the start-up. This company is also responsible for considering other valid safety regulations as well as the definition of the requirements for the component which control the STO function in compliance with standards.



Danger

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

9.2 Safety concept

The devices of the ZETADYN 4C series have two safety-related inputs (two-channel structure). The drive can only generate a torque when a 24V switching signal is applied to both of these inputs. When the two 24V switching signals are switched off, the STO function is activated and the activation of the switching transistors (IGBTs) is safely prevented.

An internal diagnostic unit constantly compares the status of the two switch-off channels (STO_A and STO_B). If there is an error (unequal activation or an internal hardware defect), the internal diagnostic unit triggers switch-off of the drive.



Information

In the version according to the principle circuit diagram, monitoring of the two relays K1/K2 by the lift control is not necessary in order to meet the requirements of EN81-1. The requirements are met by the internal diagnostic unit.

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



Danger

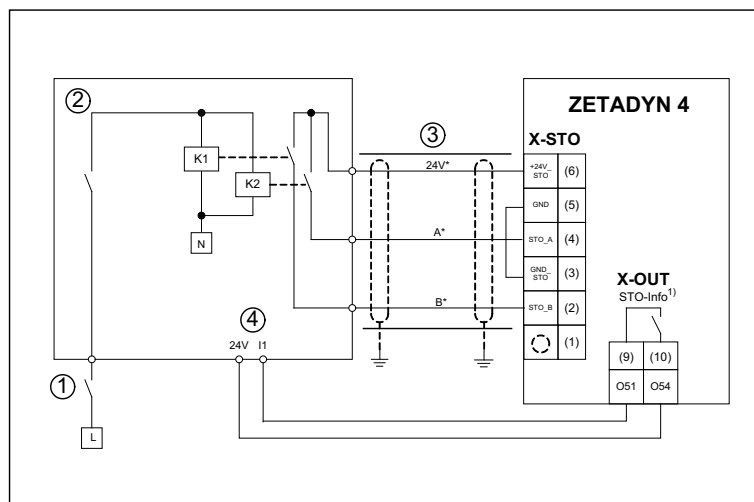
The connected motor is not separated from the ZETADYN 4 by activation of the STO function. Therefore, you must disconnect the ZETADYN 4 from the supply voltage in order to perform work on the wiring or the motor. You must wait at least Allow 3 minutes for discharging the intermediate circuit capacitors. The safe isolation from the supply must be checked using a two-pole voltage tester.



Danger

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

9.3 Principle circuit diagram



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

- 1 Safety circuit
- 2 Modulation
- 3 Protected routing or design with two separate jacketed cables (see chapter "STO interface (X-STO)")
- 4 Digital inputs control
- * Wire designation of the pre-assembled connecting lead L-SL-xx-HX-ZA4-STO
- 1) Information only, not safety-related

9.4 Electrical connection

The connection is made via the interface X-STO on the ZETADYN 4 (see chapter "Electrical installation/STO function (X-STO)").

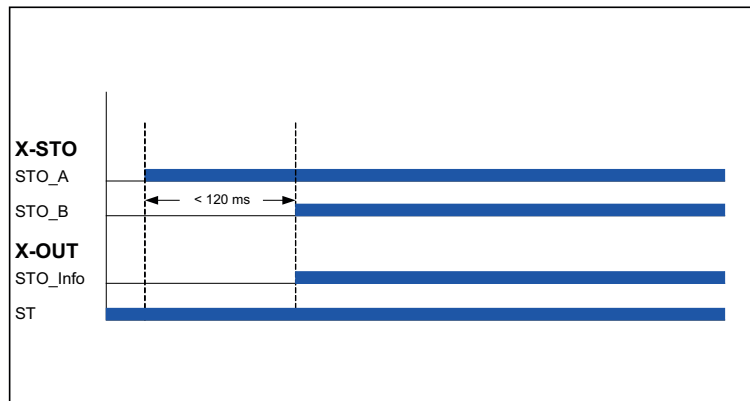
9.5 Notes for operation

The two STO inputs must be switched simultaneously by separate relays with every travel (two-channel activation). Removal of one of the two STO_A or STO_B input signals already leads to switching off of the output stage.

When switching the STO input signals STO_A / STO_B, a time offset of max. 120 ms is tolerated between the signals. In the event of a greater offset the ZETADYN 4 first triggers the error "STO: fault" (error 533). This gives the elevator control system the option of aborting travel.

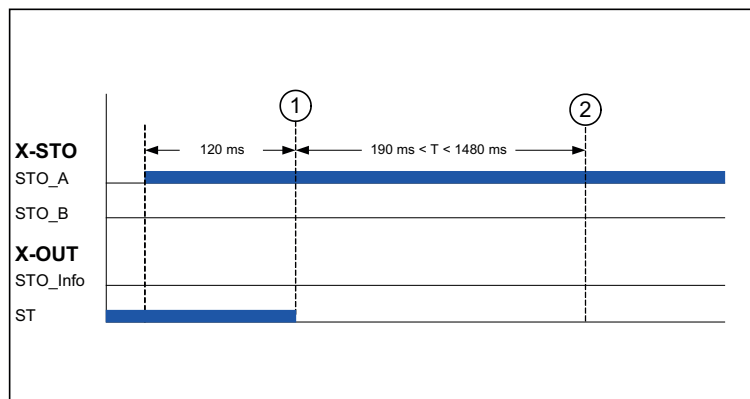
If the actuation fault persists, safe switch-off is effected after a further min. 190 ms and max. 1,480 ms (typically 630 ms) by the internal diagnostics (error 960 "STO: diagnostics").

An error detected by the internal diagnostic (unequal activation or internal hardware defect) leads to a locked error state. The error can only be reset after switching the line voltage off/on.



Correct activation STO

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



Faulty activation STO

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

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

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

The correct activation of the STO inputs is monitored additionally (not safety-related) by the ZETADYN 4 for every travel:

- If the safe torque off is not cancelled (signals STO_A, STO_B remain LOW) at the beginning of travel after expiry of the time specified by the T_SDLY parameter (Monitors menu), the error "STO: Remains" (error 530) is triggered.
- If no safe torque off takes place (signals STO_A, STO_B remain HIGH) at the end of travel after expiry of the time specified by the T_SDLY parameter (Monitors menu), the error "STO: Missing" (error 532) is triggered.
- If the safe torque off is cancelled at standstill (no travel signals applied) (signals STO_A, STO_B become HIGH) and no travel signal is applied after the time specified by the T_SDLY parameter (Monitors menu), the error "STO: Travel signal missing" (error 534) is triggered.

- If the STO input signals are switched off during travel, the error "STO: Interruption" (error 531) is triggered after 200 ms.

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

9.6 Notes on use of motors



Danger

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

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

The maximum possible cabin movements allowed by the alignment torque can be calculated with the following formula:

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

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

Examples for max. cabin movement in mm with ZETATOP (20-pole)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|--------|-----|-----|--------|-----|-----|--------|-----|-----|--------|-----|-----|--------|-----|-----|--------|-----|-----|--------|-----|-----|--------|-----|-----|--------|-----|-----|
| Ø driving disk | 160 mm | | | 210 mm | | | 240 mm | | | 320 mm | | | 400 mm | | | 450 mm | | | 500 mm | | | 520 mm | | | 600 mm | | |
| Suspension | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 |
| Cabin movement [mm] | 26 | 13 | 7 | 33 | 17 | 9 | 38 | 19 | 10 | 51 | 26 | 13 | 63 | 32 | 16 | 71 | 36 | 18 | 79 | 40 | 20 | 82 | 41 | 21 | 95 | 48 | 24 |

Examples for max. cabin movement in mm with ZETASYN (30-pole)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|---|---|---|---|---|---|---|---|---|--------|-----|-----|--------|-----|-----|--------|-----|-----|--------|-----|-----|--------|-----|-----|--------|-----|-----|
| Ø driving disk | - | | | - | | | - | | | 320 mm | | | 400 mm | | | 480 mm | | | 520 mm | | | 600 mm | | | 680 mm | | |
| Suspension | - | - | - | - | - | - | - | - | - | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 | 1:1 | 2:1 | 4:1 |
| Cabin movement [mm] | - | - | - | - | - | - | - | - | - | 34 | 17 | 9 | 42 | 21 | 11 | 51 | 26 | 13 | 55 | 28 | 14 | 63 | 32 | 16 | 72 | 36 | 18 |

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

9.7 Deactivation of the STO function



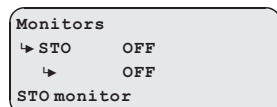
Danger

There is no safety-related switch-off of the output stage when the STO function is deactivated. Safety switch-off in accordance with EN81 must then be implemented by other measures (e.g. by motor contactors).

The STO function can be deactivated by the following measures:

- Bridging of +24V_STO (terminal 6) to the two inputs STO_A (terminal 4) and STO_B (terminal 2)
- Bridging of GND (terminal 5) to GND_STO (terminal 3)

If the STO function is deactivated, the monitoring of the STO function must also be deactivated in the "Monitors/STO" menu.



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

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

9.9 Technical data

| Safety characteristics | |
|--|---|
| Safety function | Safe torque off (STO) according to DIN EN 61800-5-2 |
| Safety class | SIL 3 according to DIN EN 61800-5-2 ¹⁾ Category 4, PL e according to DIN EN ISO 13849-1 ¹⁾ Meets the requirements according to DIN EN 81-1, section 12.7.3 ¹⁾ or DIN EN 81-2, section 12.4.1 |
| Probability of one dangerous failure per hour (PFH) | 3.11E-10 per hour ²⁾ |
| Mean time to dangerous failure of each channel (MTTFd) | 410 years ²⁾ |
| Diagnostic coverage (DC) | high |
| Switch-off time (duration from switching off the input signals to blocking the output stage) | < 50 ms |
| Minimum request rate for the STO function | Once an hour for at least 1,600 ms |
| Life cycle | 20 years, then the device must be replaced by a new one |
| max. permissible time offset between the STO A / STO B signals | max. 120 ms (on exceeding this, ZETADYN 4 outputs an error message, see chapter "Safe Torque Off (STO) Function / Notes on Operation") |

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

²⁾ assuming maximum device load for the entire life cycle

10 Serial communication

10.1 DCP (Drive Control & Position)

The DCP-mode enables serial activation of the ZETADYN 4 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.

10.1.1 Electrical connection

The connection is made via the interface X-DCP on the ZETADYN 4 (see chapter "Electrical Installation / DCP Interface (X-DCP)").

10.1.2 The various DCP protocols

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 ZETADYN 4 as command bits and receives the status messages as status bits as return information from the ZETADYN 4 (e.g. signals for mechanical brakes and motor contactor, speed monitoring and general alarm).

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
- an automatic compatibility check between the software in the ZETADYN 4 and software in the control

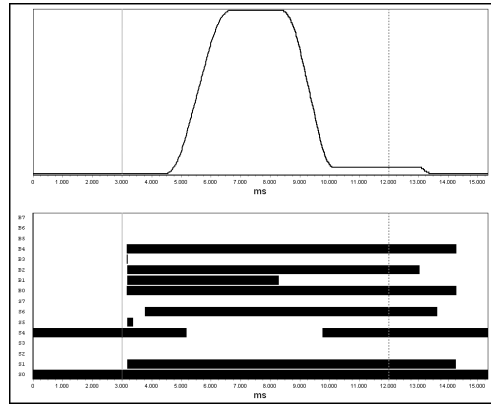
DCP_02

The transmission of the command and status bits is performed according to the DCP_01 protocol. The travel is also oriented towards the remaining distance: the control uses the ZETADYN 4 start command to specify the path to the next level. This path is continuously updated during travel (remaining distance). The ZETADYN 4 adapts its travelling speed in line with the remaining distance, and the cabin travels directly into the level in a smooth and time-optimised manner without the use of creep speed. An absolute value encoder must be present in the shaft in order to specify the remaining distance! The braking distance (shown in the frequency inverter display) must be manually entered into the control prior to this. Using the braking distance entered and the current remaining distance, the control can decide during travel whether it is still possible to stop in the event that a corresponding command is received. If no command is received by the necessary delay path at the latest, then the remaining distance is extended by an additional level.

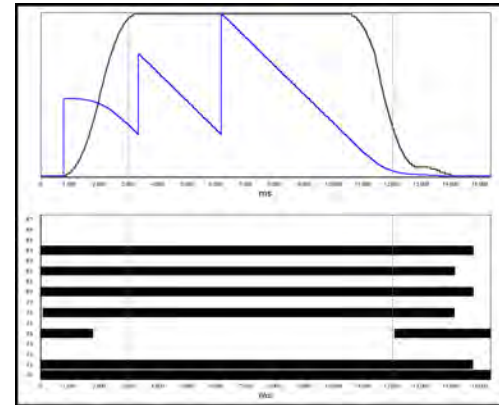
DCP_04

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
- an automatic compatibility check between the software in the ZETADYN 4 and software in the control
- a 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.



Signal curve DCP_01, DCP_03



Signal curve DCP_02, DCP_04

| Command byte | | Speed default byte | | Status byte | |
|--------------|----------------------------------|--------------------|-----------------------|-------------|---------------------------------------|
| B0 | Controller enable RF | G0 | slow speed (V1) | S0 | Frequency inverter ready for next run |
| 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 |

The command, speed and status bytes can be read in the **Info menu / page 15**.

```
DCP Bits----- 15
B01..4... G...4...
S.1....6. 100
```

10.1.3 Configuring in DCP mode

10.1.3.1 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
↳ CONFIG 04:BP_DCP1
  ↳      05:BP_DCP2
Configuration
```

| Manufacturer | DCP-protocol | Mnemonic ZETADYN 4 |
|-----------------------------|--------------|--------------------|
| 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 Liftechnik | DCP1 | 17:WL_DCP1 |
| Weber Liftechnik | DCP2 | 18:WL_DCP2 |
| Weber Liftechnik | DCP3 | 19:WL_DCP3 |
| Weber Liftechnik | DCP4 | 20:WL_DCP4 |

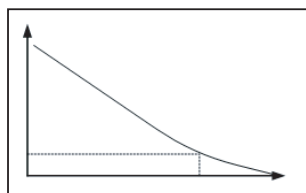
| | | |
|-------------------|------|------------|
| KW AUFZUGSTECHNIK | DCP3 | 26:KW_DCP3 |
|-------------------|------|------------|

10.1.3.2 Setting the DCP-leveling behavior

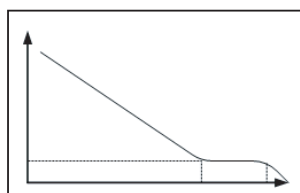
The behavior during direct leveling (only in DCP_02 and DCP_04) can be set in the **DECELERATION/S_ABH** menu.

```

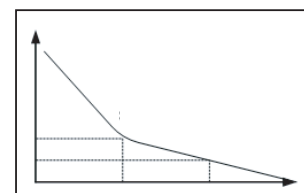
Delay
↳ S_ABH  DCP_comf
    ↳    DCP_slow
Distance dependency
    
```



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

10.2 CANopen lift

10.2.1 Start-up the CAN-interface

10.2.1.1 Information for start-up

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.

10.2.1.2 ZETADYN 4

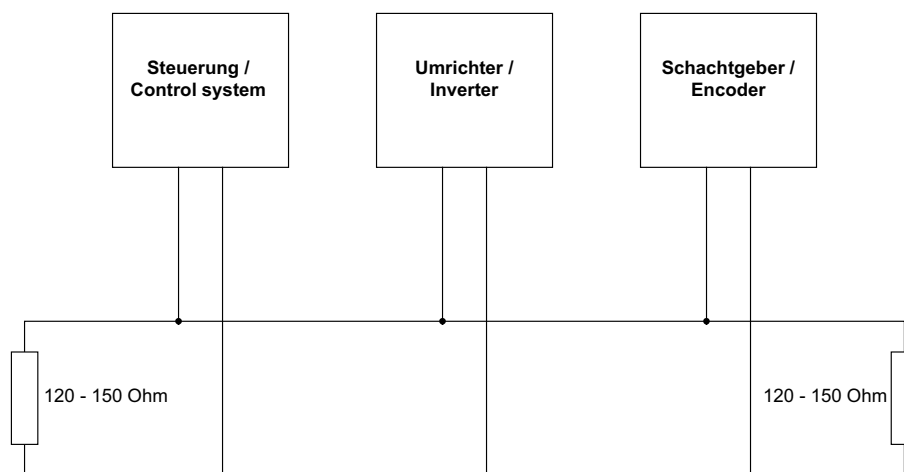
- Only devices with the CiA 417 profile are allowed.
- All devices work in 11 bit - mode.
- By implication, there can be one ZETADYN 4C connected to one bus-system.
- When more than one ZETADYN 4C per bus-system are needed, please call Ziehl-Abegg before installing.

10.2.1.3 Bus-cable

- A shielded bus-cable is not needed, but the data wires should be twisted.
- The installation takes place in line structure. The separate 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.

10.2.1.4 Wiring

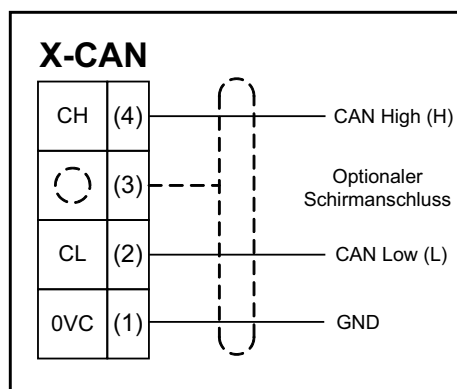
- The bus cable is connected at the "X-CAN" slot of the ZETADYN 4.
- Take care of the maximum bus length.
- Not correctly shielded motor-, brake chopper- or brake resistor cables can cause significant errors.
- In case of an error, check the shielding of the cables.



Exemplary assembly of a bus-system with CANopen

10.2.1.5 Electrical connection

The bus cable is connected by the interface X-CAN at the ZETADYN 4



Connection CAN

10.2.1.6 Activating the interface

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

```
Control
↳ CONFIG 01:BP_DCP1
  ↳ 02:BP_DCP2
Configuration
```

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

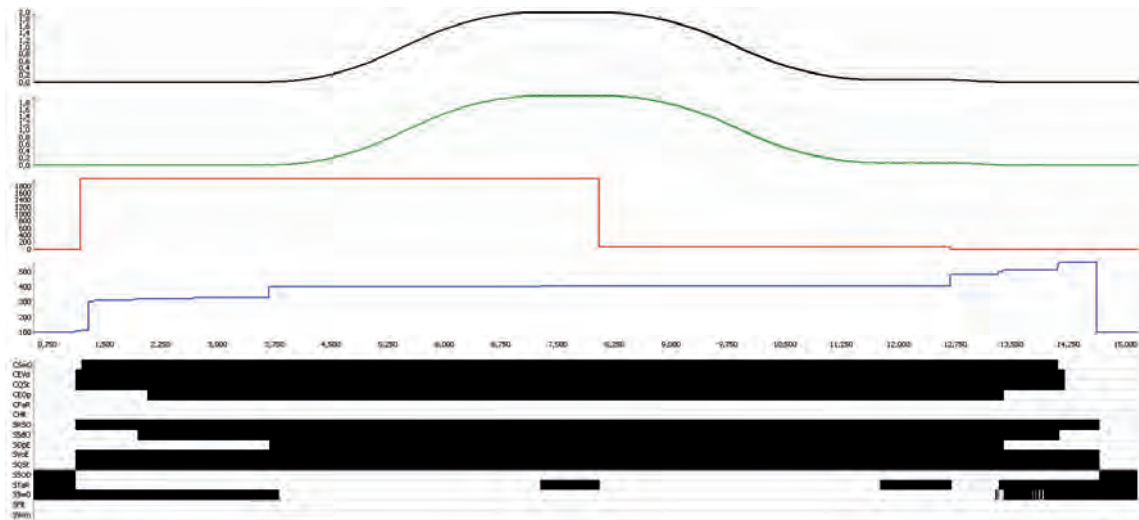
10.2.1.7 Operation modes



Information

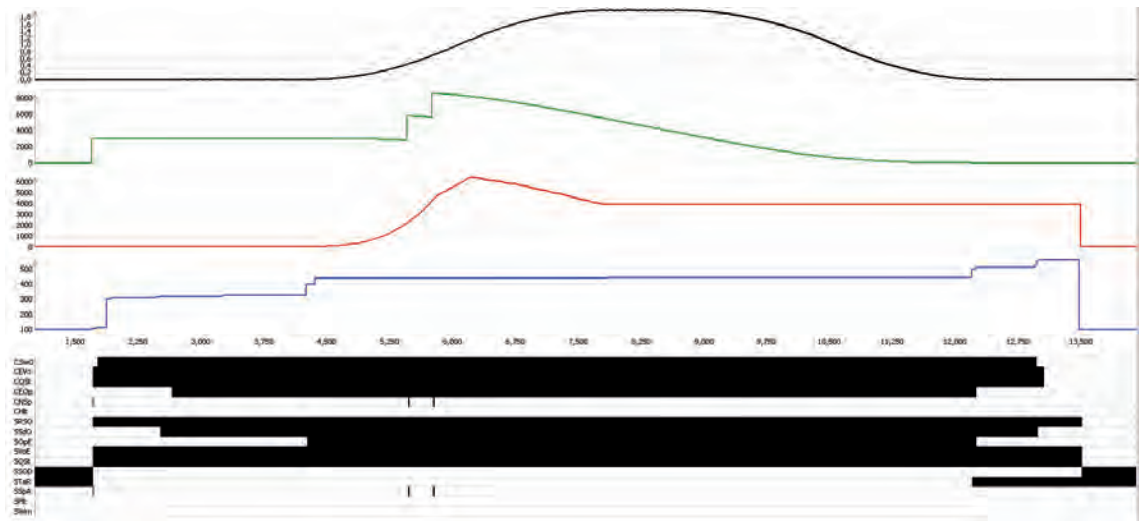
For the ZETADYN 4C are two operation modes by using CAN:

- Velocity Mode (Velocity Mode [pv])



Velocity Mode

- Position Mode (Position Mode [pp])



Position Mode

The used mode can be set in the menu "CAN/MODE" of the ZETADYN 4C. Generally the mode is sent from the control system to the ZETADYN 4C shortly before start-up. Therefore you have to set the operation mode in the control system.

When the ZETADYN 4C is operated in position mode, the shaft-encoder has to be connected to the same bus as the ZETADYN 4C.

The control system transmits the travel speed to the ZETADYN 4 before every drive. If the transmitted speed couldn't be reached, the ZETADYN 4 initiates a pointed arch drive. Therefore the maximum speed has to be entered in the control system.

10.2.1.8 Command- and Statusbits of the recorder

- Position Mode [pp] C&S / Velocity Mode [pv] C&S
- C = Command = command from the control to the frequency inverter
- S = Status = Status of the ZETADYN 4 as reaction to a previous command from the control

| 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 |

| Status- / Commandbit | Description | Comment |
|----------------------|-----------------------------|------------------------------|
| 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 |
| SFit | Status Fault | |
| SWrn | Status Warning | |

10.2.2 Parameter

10.2.2.1 Parameter settings

The separate 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 ZETADYN 4: 2 Rotary encoder: 4 | 1 ... 128 | 2 |
| BD_RATE | Transmission rate (baud rate) | 10 kBd ... 250 kBd | 250 kBd |
| MODE | Operating mode of the ZETADYN 4C | 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 CAN-specific displays are in the **Info menu** on **pages 14 - 17** (see chapter "Parameters List").



Information

The in the ZETADYN 4C adjusted nominal travel speed V^* has to be equal or higher than the speed which is sent to the ZETADYN 4C by the control system. Otherwise no drive takes place.

10.2.2.2 Network Management Status

| | | |
|--------------------------|------------|--|
| Status: | BootUp: | ZETADYN 4C is switching to the bus |
| | Stop: | ZETADYN 4C was stopped (normally by the control system) |
| | Preop.: | ZETADYN 4C can be parametrised, but before the it has to be set to "operational". |
| | Opera.: | ZETADYN 4C 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) |

11 Parameter list



Information

Not all of the described parameters are freely accessible and visible. The indication of the parameters depends on the chosen functions and the adjustments of the ZETADYN 4.

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

11.1 Basic-Level

The **Startup**, **Statistic** and **Memory Card** menus are displayed in the basic level.

The **Startup** menu is only displayed in the basic level. The **Statistic** and **Memory Card** menus are displayed in both the basic level and advanced level. They are described in the chapters "Parameters List / Statistic Menu" and "Parameters List / Memory Card Menu". See the chapter "Operation and Parameterisation / The different operating levels" for information about the basic level.

11.1.1 Startup menu

All the parameters required for first-time start-up are contained in the **Start-up** menu.

| 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: 4CX\Update\Language | Deutsch English Türkce Nederland Espanol Italiano Svenska Czech France Polski Po Russki | Deutsch |
| USR_LEV | User Level Choice about the user level which is active on the ZETAPAD after starting the ZETADYN4C. | 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 ... 6000 rpm | Depends on configured motor type |
| f | Enter the motor's rated frequency | 3.0 ... 200 Hz | |
| I | Enter the motor's rated current | 5.0 ... 200 A | |
| U | Enter the motor's rated voltage Enter the motor's rated current | 200 ... 460 V | |
| p | Enter the motor's rated power | 1.0 ... 90 kW | |
| 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: absolute encoder Codeface: absolute encoder A TTL sine: 5 V rotary encoder with sine signal TTL rect.: 5 V rotary encoder with rectangle signal HTL 10-30 V: 10-30 V rotary encoder with rectangle signal No ENC.: Open-loop-mode | EnDat/SSI HTL 10-30V TTL square TTL Sine Hiperface Codeface ERN1387 No ENC. | Depends on configured motor type |
| ENC_INC | Enter encoder resolution (pulses/revolution) | 64 ... 4096 | |
| 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 resistor type BR11 PFU+BR17: Power Feedback Unit + Brake resistor type BR17 PFU+BR25: Power Feedback Unit + Brake resistor type BR25 PFU+BR50: Power Feedback Unit + Brake resistor 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 resistor 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 ZArec: ZArec power feedback unit | 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 ZArec | BR17 |
| V* | Enter the installation rated speed | 0.00 ... 4.00 m/s | 1.00 |
| __D | Enter the diameter of the traction sheave | 0.06 ... 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:i1 | 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 to 32000 | 600 |

| Parameter | Description | Value range | Factory setting |
|---------------|---|---|---------------------------|
| CONFIG | <p>Configuration of the digital inputs according to the used control system and type of communication</p> <p>00:Free: Outputs are freely configurable</p> <p>01:ZA_IO: Ziehl-Abegg standard control</p> <p>02:ZA_CAN: Ziehl-Abegg CAN</p> <p>03:BP_IO: Böhnke+Partner standard control</p> <p>04:BP_DCP1: Böhnke & Partner DCP1</p> <p>05:BP_DCP2: Böhnke & Partner DCP2</p> <p>06:BP_DCP3: Böhnke & Partner DCP3</p> <p>07:BP_DCP4: Böhnke & Partner DCP4</p> <p>08:KN_IO: Kollmorgen standard control</p> <p>09:KN_DCP3: Kollmorgen DCP3</p> <p>10:KN_DCP4: Kollmorgen DCP4</p> <p>11:NL_IO: New Lift standard control</p> <p>12:NL_DCP3: New Lift DCP3</p> <p>13:SS_IO: Schneider Steuerungen standard control</p> <p>14:SS_DCP3: Schneider Steuerungen DCP3</p> <p>15:ZA_BIN: Ziehl-Abegg standard control with binary speed presetting</p> <p>16:WL_IO: Weber Liftechnik standard control</p> <p>17:WL_DCP1: Weber Liftechnik DCP1</p> <p>18:WL_DCP2: Weber Liftechnik DCP2</p> <p>19:WL_DCP3: Weber Liftechnik DCP3</p> <p>20:WL_DCP4: Weber Liftechnik DCP4</p> <p>21:ST_IO: Strack Lift Automation standard control</p> <p>22:ST_DCP3: Strack Lift Automation DCP3</p> <p>23:ST_DCP4: Strack Lift Automation DCP4</p> <p>24:CSILVA: Carlos Silva standard control</p> <p>25:S+S: Schmitt+Sohn standard control</p> <p>26:KW_DCP3: KW Aufzugstechnik DCP3</p> <p>27: MAS_BIN: Masora standard control</p> <p>28: BU_SATU: Hydraulic elevator aggregate with Bucher-Aggregat type Saturn ALPHA</p> <p>29: BU_ORIO: Hydraulic elevator aggregate with Bucher-Aggregat type Orion ALPHA</p> <p>30: KS_IO: Georg Kühn Control systems standard control</p> <p>31: KL_IO: Kleemann standard control</p> <p>32: S_SMART: Schindler Smart standard control</p> | <p>00:Free</p> <p>01:ZA_IO</p> <p>02:ZA_CAN</p> <p>03:BP_IO</p> <p>04:BP_DCP1</p> <p>05:BP_DCP2</p> <p>06:BP_DCP3</p> <p>07:BP_DCP4</p> <p>08:KN_IO</p> <p>09:KN_DCP3</p> <p>10:KN_DCP4</p> <p>11:NL_IO</p> <p>12:NL_DCP3</p> <p>13:SS_IO</p> <p>14:SS_DCP3</p> <p>15:ZA_BIN</p> <p>16:WL_IO</p> <p>17:WL_DCP1</p> <p>18:WL_DCP2</p> <p>19:WL_DCP3</p> <p>20:WL_DCP4</p> <p>21:ST_IO</p> <p>22:ST_DCP3</p> <p>23:ST_DCP4</p> <p>24:CSILVA</p> <p>25:S+S</p> <p>26:KW_DCP3</p> <p>27:MAS_BIN</p> <p>28:Bucher_SATU</p> <p>29:Bucher_ORIO</p> <p>30:KS_IO</p> <p>31:KL_IO</p> <p>32:S_SMART</p> | 01:ZA_IO |
| MO_DR | <p>Changing the rotating direction of the motor</p> <p>It must be observed the with triggering the input RV1 the cabin drives upwards</p> <p>left: Rotary direction left</p> <p>right: Rotary direction right</p> | <p>left</p> <p>right</p> | left |
| BR | <p>Motor brake monitoring</p> <p>Input of number and function of the brake monitoring contacts used</p> <p>OFF:no brake monitoring connected</p> <p>1*NC: 1x normally closed contact (Contact closed when brake currentless)</p> <p>2*NC: 2 x normally closed contact (Contact closed when brake currentless)</p> <p>3*NC: 3 x normally closed contact (Contact closed when brake currentless)</p> <p>1*NO: 1 x normally open (contact is open when brake currentless)</p> <p>2*NO: 2 x normally open contact (contact is open when brake currentless)</p> <p>3*NO: 3 x normally open (contact is open when brake currentless)</p> | <p>Off</p> <p>1*NC</p> <p>2*NC</p> <p>3*NC</p> <p>1*NO</p> <p>2*NO</p> <p>3*NO</p> | accordingly to motor type |

| Parameter | Description | Value range | Factory setting |
|----------------|--|--------------------------|-----------------|
| 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 |

11.2 Advanced-Level

The menus of the advanced level are described below. See the chapter "Operation and Parameterisation / The different operating levels" for information about the advanced level.

11.2.1 LCD & Password menu

Selection the desired operating language. Protects the ZETADYN 4 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: 4CX\Update\Language | Deutsch English Türkce Nederland Espanol Italiano Svenska Czech France Polski Po Russki | Deutsch |
| USR_LEV | User Level Choice about the user level which is active on the ZETAPAD after starting the ZETADYN 4C. | 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 |

11.3 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 ... 6000 rpm | Depends on configured motor type |
| f | Enter the motor's rated frequency | 3.0 ... 200 Hz | |
| p | Displays the number of pole pairs of the motor | nicht einstellbar | |
| I | Enter the motor's rated current | 5.0 ... 200 A | |
| U | Enter the motor's rated voltage | 200 ... 460 V | |
| P | Enter the motor's rated power | 1.0 ... 90 kW | |
| cos phi | A Enter the motor's power factor (only for asynchronous motors) | 0.10 ... 1.0 | |
| TYP | Enter the motor's type of connection | Star Delta | Star |
| M_MAX | Maximum motor torque | 0.2 ... 5.0 | 2.0 |

11.4 Encoder & BC menu

Enter:

- Rotary encoder type
- Rotary 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: absolute encoder Codeface: absolute encoder 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 ... 4096 | 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 resistor type BR11 PFU+BR17: Power Feedback Unit + Brake resistor type BR17 PFU+BR25: Power Feedback Unit + Brake resistor type BR25 PFU+BR50: Power Feedback Unit + Brake resistor 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 resistor 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 ZArec: ZArec power feedback unit | 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 ZArec | 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 |

11.5 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 ... 4.0 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 ... 6000 rpm | 0 |
| __D | Enter the diameter of the traction sheave | 0.06 ... 1.20 m | 0.500 |
| __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 |

11.6 Control system menu

Configuring of:

- elevator control system
- Digital inputs
- Digital outputs

| Parameter | Description | Value range | Factory setting |
|---------------|---|---|-----------------|
| CONFIG | <p>Configuration of the digital inputs according to the used control system and type of communication</p> <p>00:Free: Outputs are freely configurable</p> <p>01:ZA_IO: Ziehl-Abegg standard control</p> <p>02:ZA_CAN: Ziehl-Abegg CAN</p> <p>03:BP_IO: Böhnke+Partner standard control</p> <p>04:BP_DCP1: Böhnke & Partner DCP1</p> <p>05:BP_DCP2: Böhnke & Partner DCP2</p> <p>06:BP_DCP3: Böhnke & Partner DCP3</p> <p>07:BP_DCP4: Böhnke & Partner DCP4</p> <p>08:KN_IO: Kollmorgen standard control</p> <p>09:KN_DCP3: Kollmorgen DCP3</p> <p>10:KN_DCP4: Kollmorgen DCP4</p> <p>11:NL_IO: New Lift standard control</p> <p>12:NL_DCP3: New Lift DCP3</p> <p>13:SS_IO: Schneider Steuerungen standard control</p> <p>14:SS_DCP3: Schneider Steuerungen DCP3</p> <p>15:ZA_BIN: Ziehl-Abegg standard control with binary speed presetting</p> <p>16:WL_IO: Weber Liftechnik standard control</p> <p>17:WL_DCP1: Weber Liftechnik DCP1</p> <p>18:WL_DCP2: Weber Liftechnik DCP2</p> <p>19:WL_DCP3: Weber Liftechnik DCP3</p> <p>20:WL_DCP4: Weber Liftechnik DCP4</p> <p>21:ST_IO: Strack Lift Automation standard control</p> <p>22:ST_DCP3: Strack Lift Automation DCP3</p> <p>23:ST_DCP4: Strack Lift Automation DCP4</p> <p>24:CSILVA: Carlos Silva standard control</p> <p>25:S+S: Schmitt+Sohn standard control</p> <p>26:KW_DCP3: KW Aufzugstechnik DCP3</p> <p>27: MAS_BIN: Masora standard control</p> <p>28: BU_SATU: Hydraulic elevator aggregate with Bucher-Aggregat type Saturn ALPHA</p> <p>29: BU_ORIO: Hydraulic elevator aggregate with Bucher-Aggregat type Orion ALPHA</p> <p>30: KS_IO: Georg Kühn Control systems standard control</p> <p>31: KL_IO: Kleemann standard control</p> <p>32: S_SMART: Schindler Smart standard control</p> | <p>00:Free</p> <p>01:ZA_IO</p> <p>02:ZA_CAN</p> <p>03:BP_IO</p> <p>04:BP_DCP1</p> <p>05:BP_DCP2</p> <p>06:BP_DCP3</p> <p>07:BP_DCP4</p> <p>08:KN_IO</p> <p>09:KN_DCP3</p> <p>10:KN_DCP4</p> <p>11:NL_IO</p> <p>12:NL_DCP3</p> <p>13:SS_IO</p> <p>14:SS_DCP3</p> <p>15:ZA_BIN</p> <p>16:WL_IO</p> <p>17:WL_DCP1</p> <p>18:WL_DCP2</p> <p>19:WL_DCP3</p> <p>20:WL_DCP4</p> <p>21:ST_IO</p> <p>22:ST_DCP3</p> <p>23:ST_DCP4</p> <p>24:CSILVA</p> <p>25:S+S</p> <p>26:KW_DCP3</p> <p>27:MAS_BIN</p> <p>28:BUcher_SATU</p> <p>29:BUcher_ORIO</p> <p>30:KS_IO</p> <p>31:KL_IO</p> <p>32:S_SMART</p> | 01:ZA_IO |
| MO_DR | <p>Changing the rotating direction of the motor</p> <p>It must be observed the with triggering the input RV1 the cabin drives upwards</p> <p>left: Rotary direction left</p> <p>right: Rotary direction right</p> | <p>left</p> <p>right</p> | left |
| CTRL | <p>Select the communication between the frequency inverter and the control under "CONFIG=Free"</p> <p>Standard: Parallel connection</p> <p>DCP1: Communication by DCP01 protocol</p> <p>DCP2: Communication by DCP02 protocol</p> <p>DCP3: Communication by DCP03 protocol</p> <p>DCP4: Communication by DCP04 protocol</p> | <p>Standard</p> <p>DCP01</p> <p>DCP02</p> <p>DCP03</p> <p>DCP04</p> | 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 |
| f_I02 | | 01:RF | 04:V1 |
| f_I03 | | 02:RV1-UP | 05:V2 |
| f_I04 | | 03:RV2-DOWN | 06:V3 |
| f_I05 | | 04:V1 | 07:VZ |
| f_I06 | | 05:V2 | 02:RV1-UP |
| f_I07 | | 06:V3 | 03:RV2-DOWN |
| f_I08 | | 07:VZ | 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) | 08:V4 | 00:Free |
| f_XBR2 | | 09:V5 | 00:Free |
| f_XBR3 | | 10:V6 | 00:Free |
| f_XBR4 | | 11:V7 | 00:Free |
| | | 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:STANDBY2 | | |
| | 31:STEP+ | | |
| | 32:STEP- | | |
| | 33:PFU_BR | | |
| | 34:HY_UP | | |
| | 35:HY_DOWN | | |
| | 36:/DELAY | | |
| | 37:DTE | | |
| | 38:RECORD | | |
| | 39:INV_A1 | | |
| | 40:FKT.ana | | |
| | 41:Monitor | | |
| | 43:STANDBY1 | | |
| | 44:ZR_RDY | | |
| | 45:/ESC | | |

| Parameter | Description | Value range | Factory setting |
|-----------|--|-------------------|-----------------------|
| f_O1 | Configuration of the function of the digital outputs O1 ... O5 under "CONFIG=free" (For description of the functions, see table) | Off | Fault |
| f_O2 | | MotContact | MB_Brake |
| f_O3 | | RB-Invers | MotContact |
| f_O4 | | V<V_G1 | V < V_G1 |
| f_O5 | | 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. | |
| | | Full load | |
| | | SD | |
| | | STO-Info | |
| | | /STO info | |
| | | ZR_EN | |
| 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 ZETADYN 4. This input must be triggered during the entire travel. |
| 02:RV1 | Direction preset UP | Travel direction "UP" |
| 03:RV2 | Direction preset DOWN | Travel direction "DOWN" |
| 04:V1 | Positioning speed | Speed to position the car to the stop point |
| 05:V2 | Intermediate speed | If necessary, the intermediate 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 |

| Parameter | Function | Explanation |
|-------------|--|---|
| 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 using the input terminal X-IN |
| 21:BR2 | Brake monitoring 2 | Brake monitoring with using the input terminal X-IN |
| 22:BR3 | Brake monitoring 3 | Brake monitoring with using the input terminal X-IN |
| 23:BR4 | Brake monitoring 4 | Brake monitoring with using 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:STANDBY2 | Standby 2 | Switching the ZETADYN 4 to Standby 2 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 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 in ZETADYN 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 evacuation speed |

| Parameter | Function | Explanation |
|--------------|--|---|
| 42: LZ | Distance-dependent deceleration after standstill | With active input there is a deceleration after speed 0, even when travel speeds are activated. The deceleration from travel speed V1 depends on the distance programmed for the parameter S_10. |
| 43:STANDBY 1 | Standby 1 | Switching the ZETADYN 4 to Standby 1 function to save energy |
| 44: ZR_RDY | ZArec ready | ZArec monitoring function |
| 45: /ESC | /ESC | Electronic short-circuit is deactivated |

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 "Control system" menu V_G2 is exceeded. |
| V<1.1*V_3 | Speed monitoring | Contact opens when the traveling speed V3 is exceeded by 10%. |
| 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 ZETADYN 4. |
| 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 |
| Full load | Full load | Contact closes when motor current is exceeded for 200 ms during constant travel |
| SD | Speed monitoring | Closed Loop operation: Output becomes active when deceleration from V3 actual speed < limit value V_G1. Open Loop operation: Output becomes active when deceleration from V3 nominal speed < limit value V_G1. Output becomes inactive as soon as actual/nominal speed = 0 |

| Parameter | Function | Explanation |
|------------------|-------------------------------|--|
| STO-Info | Status of the STO function | Contact is closed when the output stage is not blocked by the STO function (output is only information, not safety-related). |
| /STO info | Inverted function of STO info | Contact is closed when the output stage is blocked by the STO function (output is information only, not safety-related). |
| ZR_EN | ZArec: Controller ready | Contact closes when the following signals are present: controller enable, travelling speed and direction specification. |

11.7 Monitoring menu

Configuring the monitoring functions

| Parameter | Description | Value range | Factory setting |
|---------------|---|--|-----------------|
| MOD_ST | Behaviour of the ZETADYN 4s in case of a fault Block function: In the event that successive serious errors are reported but an error-free run is performed, you have the option of blocking the frequency inverter. The output "ST fault" remains open. The fault counter is set to 0 when an error-free run is performed. 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 Lock2.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 2 s Lock n.3 Lock n.2: Lock n.1 | Fix 2 s |
| STO | STO function monitor ON: STO monitor activated OFF: STO monitor deactivated Monitoring of the STO function should only be deactivated when the STO function is not used and motor contactors are used instead. | ON OFF | ON |
| LOCKBR | Block at brake malfunction The ZETADYN 4 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 inputs CO1 and CO2 (individual monitoring of the monitoring contacts) | OFF CO1 CO1&CO2 | AUS |

| 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 : 1 x 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 | Rotary encoder monitoring Time starts with an output of the "MB" output signal. If no rotary encoder input signals occur during this time, the frequency inverter enters error mode | 0.5 ... 7.0 s | 2.0 |
| T_SDLY | Delay STO monitoring When the STO monitor is switched on ("Monitors/STO=ON") the STO function must be activated (stop) or deactivated (start) by the STO_A and STO_B inputs within the time T_SDLY. | 0.5 ... 3.0 s | 1.5 s |
| T_CO | Debounce time of the motor contactor monitoring Monitoring time of the contactor interruption. The final stage is switched off when the contactor contacts are open for longer than the time set in the T_CO parameter. The time T_CO is active in interruptions during travel, not in a normal stop. Only accessible when contactor monitor 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 impulses are detected when the digital output "MB" is switched off, the frequency inverter issues an error message if the configured path is exceeded. | 0.10 ... 1.00 m | 0.10 |
| I_MAX | Protection against overload current depending on the nominal current of the motor If the configured value for "I_MAX" is exceeded for the time "T_I_MAX", the frequency inverter issues an error message. | 20 ... 180 % | 180 |
| T_I_MAX | Overcurrent protection If the value configured in "I_MAX" (I x "I_MAX") is exceeded for the time "T_I_MAX", the frequency inverter issues an error message. | 0.3 ... 10.0 s | 5.0 |

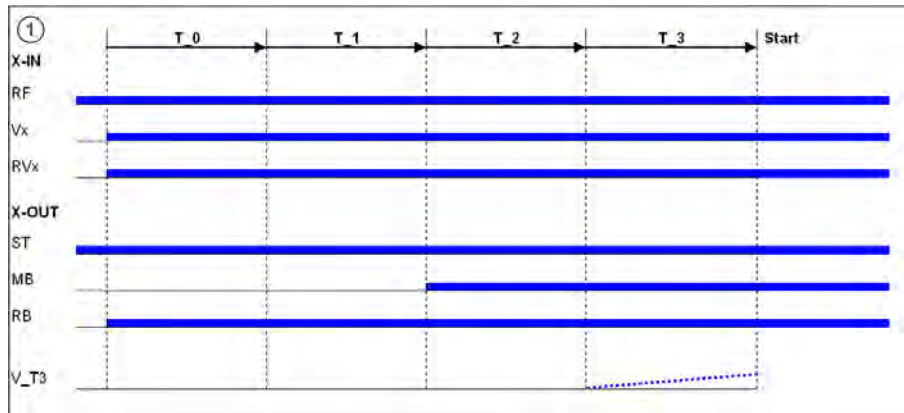
| Parameter | Description | Value range | Factory setting |
|--------------|---|-------------|-----------------|
| APC | Automatic parameter control Parameter values are checked for plausibility when entered. The values are corrected or additional parameters changes if necessary (see chapter "Error Diagnosis / Automatic Parameter Check") | 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 |
| MASK3 | | | 0 |
| MASK4 | | | 0 |
| MASK5 | | | 0 |

11.8 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 time that the contactors require to open | 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 | Gemessene Zeit, welche die Bremse zum Öffnen benötigt | 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 |

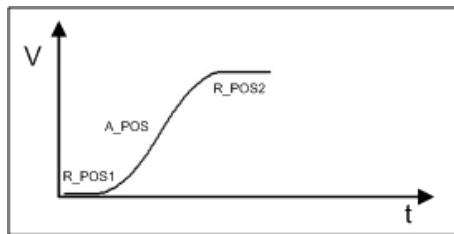
Start-up time sequence



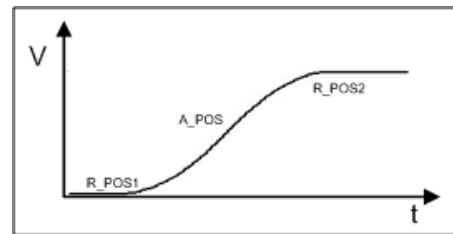
11.9 Acceleration menu

Definition of acceleration ramp.

| Parameter | Description | Value range | Factory setting |
|-----------|--|--------------------------------|--------------------|
| A_POS | Positive acceleration | 0.25 ... 2.00 m/s ² | 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

11.10 Travel menu

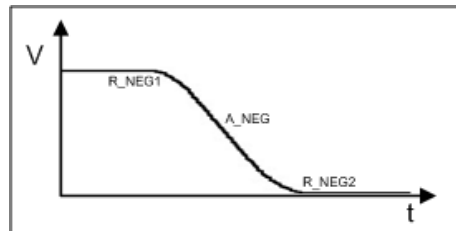
Traveling speed defaults

| 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 | 0.01 |
| 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 |

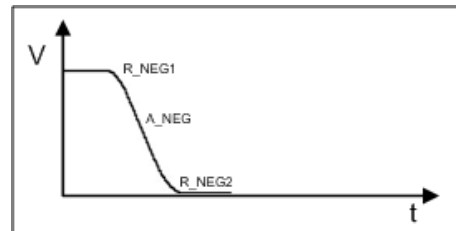
11.11 Decelerating menu

Defines the deceleration ramp and optimizes the positioning behavior.

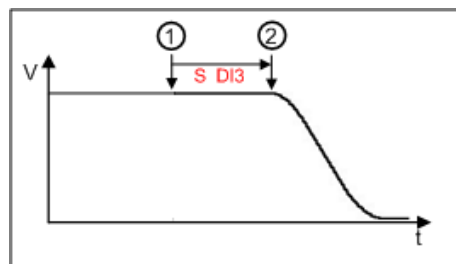
| Parameter | Description | Value range | Factory setting |
|---------------|---|---|--------------------|
| A_NEG | Negative acceleration | 0.25 ... 2.00 m/s ² | 0.5 |
| R_NEG1 | upper round off during negative acceleration, a higher value causes a softer round off | 20 ... 90 % | will be calculated |
| 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

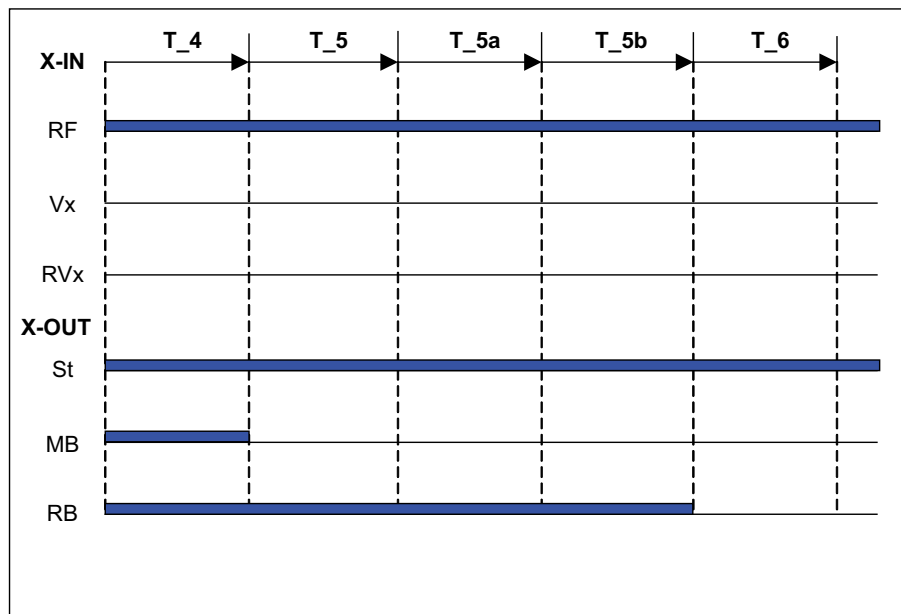
11.12 Stop menu

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 |

| Parameter | Description | Value range | Factory setting |
|-----------|--|----------------|-----------------|
| 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 | Wait until contactors open Time within which the contactor signal must be closed | 0.0 ... 10.0 s | 0.5 |

Stopping time sequence



11.13 Controller menu

Influences the speed control by the factor of the basic amplification (SPD_KP) and readjustment time (SPD_TI).

Selection of the control mode of the ZETADYN 4

| 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 parameters required for operation without a rotary encoder (open loop) are only displayed for C_MOD=U/f. The parameters are described in the chapter "Operation without a rotary encoder".

11.14 Parameter set 2 menu

A second parameter set can be stored in the frequency 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: 2.nd parameter set is blocked 2.ndParameter set: Activates the 2.nd parameter set EVAC 3: Emergency evacuation with evacuation module EVAC 3 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 3 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 ... 70.0 kW | 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 |

11.15 Statistic menu

All statistical data can be called up in the **Statistic** menu. The data remain saved even after the ZETADYN 4 has been switched off. Reading out the error list and deleting the error memory are described in the "Error diagnosis" chapter.



Information

Not all parameters are visible when the **Statistic** menu is opened in the basic level.

| Parameter | Description | Value range | Factory setting | visible in the basic level |
|----------------|--|---------------|-----------------|----------------------------|
| ST_LST | Error list | Cannot be set | - | X |
| ST_H | Operating hours | Cannot be set | - | X |
| ST_DRV | Number of trips | Cannot be set | - | X |
| ST_HDRV | Number of travel hours | Cannot be set | - | X |
| ST_UC | Usage category in accordance with VDI 4707 | Cannot be set | - | X |
| ST_RES | Number of mains interruptions | Cannot be set | - | X |

| Parameter | Description | Value range | Factory setting | visible in the basic level |
|-----------|---|----------------------------------|-----------------|----------------------------|
| ST_SRF | Number of travel aborts due to interruption of the controller enable RF during the travel | Cannot be set | - | X |
| ST_SXO | Number of travel interruptions due to interruption of the STO or CO input signal during travel operation | Cannot be set | - | X |
| ST_CRL | Delete error memory Deletes ST_LST, ST_RES and ST_SRF and ST_SCO | Cannot be set | - | |
| 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: Pre-parameterised ZETADYN 4: Parameters are assigned customer-specific system data Standard ZETADYN 4: 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 rotary encoder offset (ECOFF), it will also be deleted! | Reset 77 Reset 90 Reset 99 | 0 | X |
| 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 If the start value of the down counter is set to 0.00, the down counter is deactivated. | 0.00 ... 10.00 M | 0.00 | |
| TD_RST | Restore the counter level from the rotary encoder | On Off | Off | |

11.16 Memory Card menu

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



Information

Not all parameters are visible when the **Memory Card** menu is opened in the basic level.

| Parameter | Description | Value range | Factory setting | visible in the basic level |
|-----------|---|-------------|-----------------|----------------------------|
| SAV_ALL | Saves data to memory card with serial number allocation <ul style="list-style-type: none"> Parameter list (.PRT) in directory /4BF/DEVICE/serial number/LST Error list (.FLT) in directory /4CX/DEVICE/serial number/LST Parameter (.PA3) in directory /4CX/DEVICE/serial number/-PAR Black-Box (.BOX) in directory /4CX/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 | X |

| Parameter | Description | Value range | Factory setting | visible in the basic level |
|-----------|---|-------------|-----------------|----------------------------|
| SAV_PAR | Save parameters to memory card (copy parameters in the case of identical systems): <ul style="list-style-type: none"> Parameter (.PA4) in directory /4CX/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 | X |
| LOD_PAR | Load parameters from memory card to frequency inverter (copy parameters in the case of identical systems) Input 27: Parameters (.PA3) are loaded to the frequency inverter from the /4CX/DEVICE/FORCE directory. The parameter switches to "Off" again after loading | 27 | 0 | X |
| UPDATE | Starts the software update from a memory card. The most current software will always be loaded from the memory card. Input 27: Software is loaded to the frequency inverter from the /4CX/Update/Software version directory | 27 | 0 | |
| SAV_CFG | Saves data to memory card with configuration number allocation: <ul style="list-style-type: none"> Parameter list (.PRT) in directory /4Cx/CONFIG/configuration Parameter (.PA3) in directory /4CX/CONFIG/configuration number | 0 ... 59999 | 0 | |
| LOD_CFG | Load parameters from memory card to frequency inverter by specifying the configuration number Enter configuration number: Parameters (.PA3) are loaded to the frequency inverter from the /4CX/CONFIG directory. The parameter switches 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 | |

11.17 MMC-Recorder menu

You have the option of performing measurements on the ZETADYN 4 using a memory card, but a notebook is required for this purpose. The measurement is configured 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 |

| Parameter | Description | Value range | Factory setting | |
|----------------|---|--|-----------------|---|
| REC_NUM | Directory number Assigned number under which the directory is saved on the memory card. If "0" is entered, the serial number of the frequency inverter is used as the directory name. | | 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 | |
| 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 measurement, 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 status (frequency inverter status) 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] | | 3 | |
| CHN2 | | | 1 | |
| CHN3 | | | 143 | |
| CHN4 | | | 6 | 6 |
| | | | 15 | |
| 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 | |

11.18 Encoder adjustment menu



Contains parameter values required for aligning the absolute value encoders for synchronous motors.

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

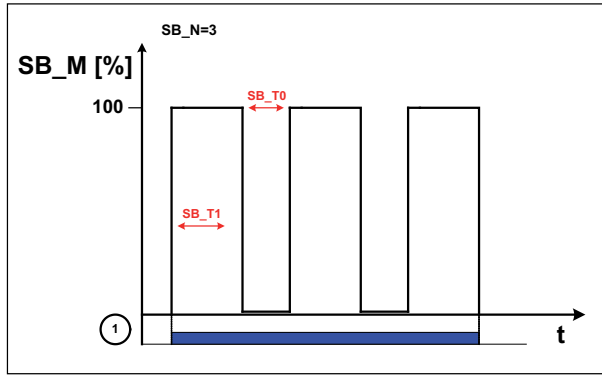
| Parameter | Description | Value range | Factory setting |
|-----------|---|---------------|-----------------|
| ENC_ADJ | Activating the encoder alignment Off: no function On: Start or check the rotary encoder calibration | On Off | Off |
| ENC_POS | Encoder Position Numerical display of the absolute position of the rotary encoder per revolution: 0 to [4x number of pulses in rotary encoder] rpm | Cannot be set | - |
| 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 |
| SAV_P_E | Filing data in the absolute encoder with the "electronic name plate" function On: Data from the ZETADYN 4 are filed in the absolute encoder Off: Function deactivated | On Off | Off |
| LOD_P_E | Reading out data from the absolute encoder with the "electronic name plate" function Input 27: Data are read out of the absolute encoder into the ZETADYN 4 | 0...65535 | 0 |

11.19 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 calculated as a percentage of the maximum operating current of the frequency inverter (nominal 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"

11.20 HW-Ident. menu

Identification of the individual assemblies in the ZETADYN 4. The identification of the assembly is generally downloaded directly from its EEPROM.

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

11.21 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 |

11.22 Menu checks

Selection of supporting tests during acceptance of the system:

- Testing of the protection device according to EN81-A3

| Parameter | Description | Value range | Factory setting |
|-----------|--|-------------|-----------------|
| SCY_EN | Enabling of the test functions On: Functions are accessible Off: No access to the functions After a test function has been performed, this parameter automatically adopts the "Off" value. | On Off | Off |
| SCY_ENC | Rotary encoder test On: Failure of the rotary encoder is simulated Off: Function deactivated | On Off | |

| Parameter | Description | Value range | Factory setting |
|-----------|--|----------------------------------|-----------------|
| SCY_TMP | Motor temperature test On: Failure of the motor temperature module or overtemperature on the motor is simulated Off: Function deactivated | On Off | |
| SCY_A3 | Testing of the protection device according to EN81-A3 No current: Movement of the car by releasing the brakes without power to the final stage max. accel.: Cabin is accelerated to maximum under full power Off: Function deactivated | No current max. accel. Off | Off |
| SCY_SG | Capture device test On: electronic short-circuit is deactivated Off: Function deactivated | On Off | |
| SCY_DA | Driving ability test On: Travel with recovery with applied counterweight, display of cabin movement Off: Function deactivated Only for CAN actuation. | On Off | |
| SCY_MB | Motor brakes test On: Interruption of the safety circuit, display of braking distance Off: Function deactivated Only for CAN actuation. | On Off | |

11.23 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 ZETADYN 4: 2 Rotary encoder: 4 | 1 ... 128 | 2 |
| BD_RATE | Bitrate | 10 kBd ... 250 kBd | 250 kBd |
| MODE | Operating mode of the ZETADYN 4C | Position / Velocity | Position |
| T_CMD | Maximum waiting time for commands of the control system | 200 ... 3000 ms | 1500 ms |

11.24 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: The motor phases are checked during initial travel once the frequency inverter has been switched on. If the check is successful, no further monitoring is performed. 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 |

| Parameter | Description | Value range | Factory setting |
|-----------|---|----------------------------|-----------------|
| 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 15 V. 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) |
| n_ANA | Initialisation value for analog input in ZETADYN HY Example: n_ANA = 3000 analogue input = 0-10 V 10 V = 3000 1/min | 1 ... 3300 | 3000 |



11.25 INFO menu



The **INFO menu** provides an easily accessible overview of:

- Current measurements
- Current operating states of the frequency 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.

| | |
|---|--|
| <pre>Serial No ----- 01 ZETADYN 4C013-A SN: 06128238/0001 4.42-110308xx</pre> | <p>Page 01: Serial-No. Line 2: Display of frequency inverter type and frame size: -A: Type ZETADYN 4C for asynchronous motors -S: Type ZETADYN 4C for synchronous motors -X: unknown type Line 3: Serial number/type consecutively numbered Line 4: Software version Loaded 3rd operating language</p> |
| <pre>Status ----- 02 > System OFF ◀ 530* 540* 550* 560* 100 ^0.00 0.00 0.00m/s</pre> | <p>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</p> |



| | |
|---|---|
| <pre>Dist. ----- 03 sa: 0.00 s21: 0.52m sr:^0.00 s31: 1.45m s1: 0.00 sd: 0.52m</pre> | <p>Page 03: Dist</p> <p>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)</p> <p>Line 3: sr: current direction of travel, current total route s31: calculated deceleration path V_3 * V_1 s30: calculated deceleration path V_3 * Standstill (only in DCP02/DCP04)</p> <p>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</p> <p>The display can be frozen by pressing the  button.</p> |
| <pre>Mot ----- 04 ----- +0 % real: 0rpm 0V prog: 0rpm +0.0A</pre> | <p>Page 04: Mot</p> <p>Line 2: Bar chart of motor speed A Slip in % S Load angle in °</p> <p>Line 3: Actual motor speed Motor voltage</p> <p>Line 4: Target motor speed Motor current</p> <p>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).</p> <p>The display can be frozen by pressing the  button.</p> |
| <pre>MotDat ----- 05 I: 11.0A n: 60rp U: 360V f:10 Hz p: 10</pre> <pre>MotDat ----- 05 I: 11.0A n: 1450rp cos:0.88 f: 50.0Hz IO: 3.8A TR: 316ms</pre> | <p>Page 05: MotDat Display of the motor data entered in the "Motor name plate" menu:</p> <p>S</p> <p>Line 2: Rated current Nominal speed</p> <p>Line 3: Nominal voltage Rated frequency</p> <p>Line 4: Number of pole pairs</p> <p>A</p> <p>Line 2: Rated current Nominal speed</p> <p>Line 3: cos phi Rated frequency</p> <p>Line 4: Magnetization current Rotor time constant</p> |

| | |
|--|--|
| <pre> MotDatFW ----- 05 I: 11.0A n: 1560rp cos:0.89 f: 53.4Hz IO: 3.5A TR: 316ms </pre> <pre> MotDatNom ----- 05 I: 11.0A n: 1450rp cos:0.88 f: 50.0Hz IO: 3.8A TR: 316ms </pre> | <p>Page 05: MotDatFW Display of the calculated motor data with field weakening operation:</p> <p>A</p> <p>Line 2: Rated current Nominal speed</p> <p>Line 3: cos phi Rated frequency</p> <p>Line 4: Magnetization current Rotor time constant</p> <p>Seite 05: MotDatNom By pressing the  button, the original motor date will be displayed</p> |
| <pre> RegLimits ----- 06 SP IQ ID PS U LIM:.. • PEK: </pre> | <p>Page 06: RegLimits Online display of whether a control loop has reached the limit</p> <p>Line 2: SP: Speed controller IQ: Current controller (torque creation current) ID: Current controller (flux creation current) PS: Position controller U: Voltage limit of the frequency inverter</p> <p>Line 3: Alarm bell left: minimum limit reached Alarm bell right: maximum limit reached</p> <p>No alarm bell should appear during a faultless, normal trip.</p> |
| <pre> Brake Chopper ----- 07 Internal 1.4kHz BC • U_DC: ----- 565V Ampl: ----- 0% </pre> | <p>Page 07: Brake-Chopper Online-display</p> <p>Line 2: Internal PWM frequency (only for brake resistor) Condition of function and temperature monitoring on the input terminal BC (larger point = OK)</p> <p>Line 3: DC-link voltage as bar chart display DC-link voltage</p> <p>Line 4 (only with Brake resistor): Modulation of Brake resistor as bar chart display Modulation of Brake resistor in %</p> <p>The DC-link voltage displayed in standstill must have the value "Mains connection voltage x 1,41".</p> <p>A large point must constantly be displayed behind the function and condition monitor.</p> <p>Pressing the  button Display will be frozen Display of the loaf of the brake resistor (average value over 120s)</p> |


| | |
|--|--|
| <pre> Cu Functions----- 08 CONFIG 00: Free I:RF RV.2 V..... O:.. VG1 </pre> | <p>Page 08: Cu-Functions Online-display Line 2: Selected control system configuration in menu "Control system/CONFIG" Line 3: Active digital input functions:</p> <ul style="list-style-type: none"> • Controller enable (RF) • Direction of travel (RV) • Traveling speed (V) <p>Line 4: Active digital output functions</p> |
| <pre> Start/Stop ----- 09 STOA:• STOB:• DIAG:• RF RB CO MB BR1234 E • </pre> | <p>Page 09: Start / Stop Online display of the digital inputs and outputs important for the start / stop process: Line 2: STOA: Status STO_A (input) STOB: Status STO_B (input) Large dot next to the designation indicates that there is a signal at the input and the internal diagnostic unit for monitoring the STP inputs has detected no error The output stage is safely disabled (STO deactivated) if there is no signal at the inputs. DIAG: Status of the internal diagnostic unit Large dot next to the designation indicates that the internal diagnostic unit has not detected any error, if no dot is displayed, the internal diagnostic unit has detected an error 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 E: Electronic short-circuit status Line 4: RF, RB, CO, MB, BRx: A large dot beneath the description indicates the input or output is active</p> <p>A "!" under the monitor input "CO" or "BR" indicates that this monitoring function has been deactivated in the "Monitoring" menu.</p> <p>E: Small dot: short-circuit deactivated Large dot: short-circuit active o: short-circuit switches from inactive to active (duration 1.1 s) t: short-circuit switches from active to inactive (duration 1.1 s)</p> |
| <pre> Cu Ports ----- 10 In: Out: 12345678 BC C12 1234 • </pre> | <p>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</p> |

| | |
|--|---|
| <pre>Encoder ----- 11 Incr:2048 Type:ENDAT Enable●● Err: 0 Cnt:3941=345° A B</pre> | <p>Page 11: Encoder Online-display Line 2: Configured rotary encoder resolution Detected rotary encoder type (with absolute value encoders) Configured rotary 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: Rotary encoder fault code; 0 must be displayed if there are no faults in the rotary encoder. Line 4: Cnt: Counter reading for impulse 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)</p> <p>The display can be frozen by pressing the  button.</p> |
| <pre>Power1 ----- 12 DC IGBT PWM ED: 10% ●● ●● .. ■ FAN: 0% UDC:565V Temp: 28C</pre> | <p>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</p> <p>ED: Turn on duration of the ZETADYN 4 (time interval: 10 minutes) FAN: Speed of the fan in % Line 4: UDC: DC-link voltage Temp: Power stage temperature</p> <p>The display can be frozen by pressing the  button.</p> |

| | |
|--|---|
| <pre>Power2 ----- 13 ERR_EXT U. OC: ... SRC_APP. UCE_P: ... SRC_MOP. UCE_M:</pre> | <p>Page 12: Power2 Cause for excess current malfunction</p> <p>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 Z)</p> <p>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)</p> <p>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)</p> <p>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)</p> |
| <pre>DCP Ident ----- 14 Info: xx 0101 / 010106 en Load: 77% - 12.3A</pre> | <p>Page 14: DCP-Ident Information about the control system</p> <p>Line 2: Manufacturer</p> <p>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 frequency inverter is automatically adapted.</p> <p>Line 4 (only with DCP4): Load in % (0% = cabin empty) Load-dependent start torque current</p> |
| <pre>DCP Bits ----- 15 B01..4... G...4... S.1...6. 100 CR UP V_3* MTW</pre> | <p>Page 15: DCP-Bits Online-display</p> <p>Line 2: Command and speed bytes B= command byte G= speed byte</p> <p>Line 3: Status byte S= Statusbyte Current service condition in which the ZETADYN 4 is operating</p> <p>Line 4: Display of the actual travel commands: RF: Controller enable Travel direction controlled travel speed MTW: Motor temperature pre-warning (displayed at overtemperature)</p> <p>See chapter "Serial Communication / DCP (Drive Control & Position)" for further information about DCP operation.</p> |

| | |
|---|---|
| <p style="text-align: center;">Display 1</p> <pre>DCP Dist. ----- 16 sv_I7: +0002210 mm sv: +0002198 mm Prg:Rea 1.15:x.xxm/s</pre> <p style="text-align: center;">Display 2</p> <pre>DCP Dist. ----- 16 sv_I7: +0002210 mm sv: +0002198 mm Prg:Rea 1.15:1.10m/s</pre> | <p>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: Shows the ratio of set nominal speed to real speed. Display during travel (providing that the controller supports the "I9" position telegram) Display 2: Shows the ratio of set nominal speed to real speed. Display after travel (providing that the controller supports the "I9" position telegram)</p> |
| <pre>DCP Err ----- 17 RX_TIM 1 RX_XOR 0 TX_ERR 0</pre> | <p>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 control telegram is detected by the frequency inverter Line 4: TX_ERR: erroneous frequency inverter telegram is detected by the control</p> |
| <pre>CAN----- 14 Act• Mode: Velocity T_max: 0 RErr: 0 NMT:Preop./Warn.Lim:</pre> <pre>CAN----- 14 Act• Mode: Velocity T_max:0.7ms TErr: 0 NMT:Preop./Warn.Lim:</pre> | <p>Page 14: CAN Information about CAN operation Line 2: Act: A dot signals that the ZETADYN 4 is set to CAN Mode: Operating mode (velocity or position) Line 3: T_max: Number of cycles, which exceeded the maximum process time RErr: Recieve buffer - error counter Line 4: NMT: Shows the actual NMT status (see chapter "Serial Communication / NMT") Pressing the  button Line 3: T_max: Maximum time for processing the CAN messgges per cycle, since switch-on TErr: Transmit buffer - error counter</p> |
| <pre>CAN Velocity----- 15 V_CAN: + 0mm/s Contr.:Disable Volt. Status:Sw. On Disab.</pre> | <p>Page 15: CAN Velocity Active in velocity mode Line 2: V_CAN: speed, sent from the control system to the ZETADYN 4C Line 3: Contr. Control-byte. Shows commands which are sent by the control system Line 4: Status: Status byte. Shows CAN statuses of the ZETADYN 4C</p> |
| <pre>CAN Position----- 15 S_CAN + 0mm Contr.:Disab. Volt. Status:Sw.On Disab.</pre> | <p>Page 15: CAN Position Active in position mode Line 2: S_CAN: Relative target position, sent from the control system to the ZETADYN 4C Line 3: Contr. Control-byte. Shows commands which are sent by the control system Line 4: Status: Status byte. Shows CAN statuses of the ZETADYN 4C After pressing the  button the display shows the maximum travel speed, sent by the control system</p> |

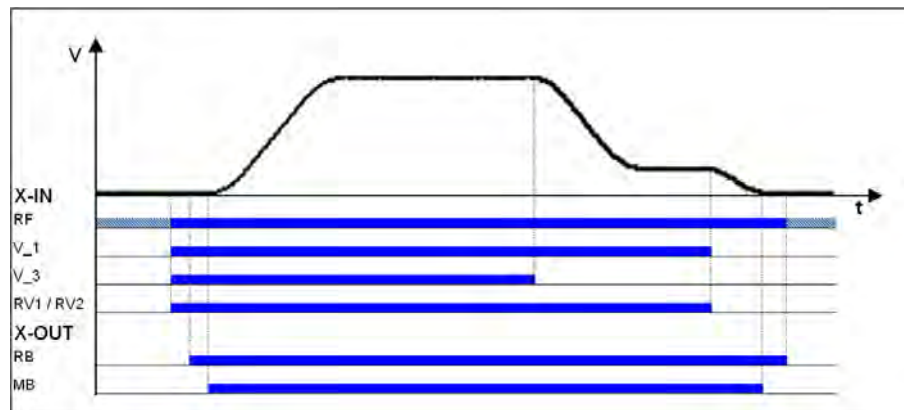
| <pre> CAN Error Info----- 16 Err act. Last:No Err Rec Tra Warn Pas off 0 0 0 0 0 </pre> | <p>page 16: CAN Error information Information about telegram errors in CANopen lift operation Line 2 (from left to right): Error status Load: Fault which last occurred</p> <table border="1"> <thead> <tr> <th></th> <th>Displayed text:</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>Error status</td> <td>"Err act." "Warning" "Err pass" "Bus off"</td> <td>Error active Warning Error passive Bus off</td> </tr> <tr> <td>Load: Fault which last occurred</td> <td>"No Err" "Stuff" "Form" "ACK" "Bit(r)" "Bit(d)" "CRC"</td> <td>no error Stuffing Error Form Error Acknowledge Error Bit Error (Recessive Level was output but Dominant Level detected) Bit Error (Dominant Level was output but Recessive Level detected) CRC Error</td> </tr> </tbody> </table> <p>Line 3 and 4: Rec: Number of receive errors Tra: Number of transmit errors Warn: Indication how often the ZETADYN 4 switched to the warning status Pas: Indication how often the ZETADYN 4 switched to the error passive status off: Indication how often the ZETADYN 4 switched to the bus off status</p> | | Displayed text: | Meaning | Error status | "Err act." "Warning" "Err pass" "Bus off" | Error active Warning Error passive Bus off | Load: Fault which last occurred | "No Err" "Stuff" "Form" "ACK" "Bit(r)" "Bit(d)" "CRC" | no error Stuffing Error Form Error Acknowledge Error Bit Error (Recessive Level was output but Dominant Level detected) Bit Error (Dominant Level was output but Recessive Level detected) CRC Error |
|---|---|--|-----------------|---------|--------------|--|---|---------------------------------|---|--|
| | Displayed text: | Meaning | | | | | | | | |
| Error status | "Err act." "Warning" "Err pass" "Bus off" | Error active Warning Error passive Bus off | | | | | | | | |
| Load: Fault which last occurred | "No Err" "Stuff" "Form" "ACK" "Bit(r)" "Bit(d)" "CRC" | no error Stuffing Error Form Error Acknowledge Error Bit Error (Recessive Level was output but Dominant Level detected) Bit Error (Dominant Level was output but Recessive Level detected) CRC Error | | | | | | | | |
| <pre> CAN Calib. 1----- 17 AbsEnc mm: 5358 MotEnc mm:+ 4169 Offs:13081A/M 1.28 </pre> | <p>Page 17: CAN Calib. Calibration Lines 2 - 4: For calibrating the distances which were sent by the rotary encoder and the shaft encoder.</p> | | | | | | | | | |
| <pre> A+R ----- 18 0.62 0.62 m/s3 0.50 0.50 m/s2 0.62 0.50 m/s3 </pre> | <p>Page 18: A&R Display of configured values for:</p> <ul style="list-style-type: none"> Acceleration Delay <p>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</p> | | | | | | | | | |
| <pre> Energy ----- 19 Power: 22.120 W Work: 16 Wh </pre> | <p>Page 19: Energy Line 2: Power: current frequency inverter power in watts Line 3: Work: work currently performed by ZETADYN in watt hours</p> | | | | | | | | | |

| | |
|---|---|
| <pre> InfoBus ----- 20 Ident No 01234567 Exist: xxxx Error 0000 </pre> | <p>Page 20: InfoBus Display of frequency inverter configuration</p> <p>Line 2: Ident no. of the internal assemblies 0: Controller Unit (CU) 1: Shunt module (CUSH) 2: reserved 3: reserved 4: reserved 5: Switching Power Print (SP) 6: Power Print (PP) 7: Module Print (MP)</p> <p>Line 3: Each available board is identified in accordance with the population of the frequency inverter (see also menu "HW Ident."): x: identification of the board by reading out the EEPROM m: identification by manual default in the menu "HW-Ident."</p> <p>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</p> <p>During flawless operation, all internal assemblies must be displayed with a "0"</p> |
| <pre> TravelDirection --- 21 TD_SET 10.00 M TD_CNT 4.32 M TD_DRV 18.45 M </pre> | <p>Page 21: Travel direction Display the direction changes</p> <p>Line 2: TD_SET: Initial value of the down counter</p> <p>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</p> <p>Line 4: TD_DRV: Total counter of the travel direction changes. Value remains after resetting the down counter</p> |
| <pre> TravelDirection --- 21 TD_RES 10 TD_CNT 4.32 M TD_DRV 18.45 M </pre> | <p>Page 21: Travel direction While pressing the  button, line 2 shows the actual number of counter resets "TD_RES".</p> |
| <pre> Cuec ----- 22 Func: DCP & CAN & AN Stat: GRN </pre> | <p>Page 22: Cuec Expansion board "Control"</p> <p>Line 2: Func: Functions of the expansion board "Control"</p> <p>Line 4: Stat: LED status of the expansion board "Control"</p> |

12 Travel options

12.1 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

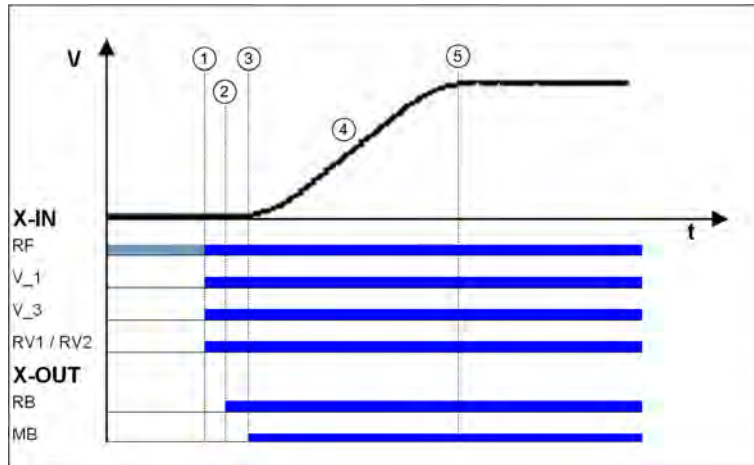
12.2 Start-up and acceleration

To be able to travel, the ZETADYN 4 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 frequency inverter inputs: <ul style="list-style-type: none"> • Controller enable (RF), can already be triggered • Speed V_1 and V_3 • Direction of travel RV1 |
| 2 | The frequency inverter switches the digital output "controller mode contactor" with a time delay. The motor contactors must be switched without delay with this signal. |
| 3 | The frequency inverter switches the digital output "MB brake" with a time delay. The brakes must be opened without delay 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

12.3 Optimizing start up behavior

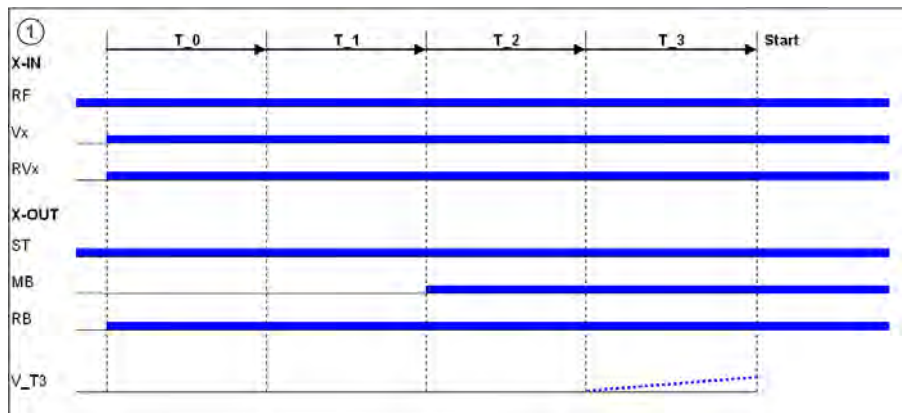
Optimizing the start up behavior is only necessary if there is a negative influence on the travel comfort (e.g. through start up jerks)



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 optimisation through contactor monitoring (optional)

With monitoring of contactors activated (Monitors/CO activated) and monitor contacts connected the time T_0 is optimised. As soon as the contactors are closed, the time T_0 is interrupted and the time T_1 started.

Time optimization through brake monitoring

If the brake monitoring is activated (**Monitoring/BR≠ON**) and the monitoring contacts are connected, the time T_2 is optimized. As soon as the brakes are opened, time T_2 is aborted and time T_3 started.

12.3.1 Damping the start-up jerk

Applies to all start-up variations!

To reduce a startup jolt, you can accelerate to speed V_T3 linearly whilst T_3 is running. This overcomes the static friction and reduces the startup jolt (see diagram).

12.3.2 Start-up variations



Information

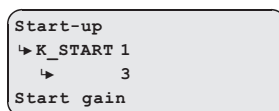
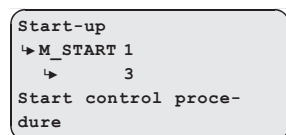
The optimal start-up variations are preset based on the motor type selection in the **Motor name plate** menu.

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.



MOD1 (standard setting for asynchronous motors)

The machine is speed controlled. Up to expiration of T_2, 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 T_1 and deactivated with the expiration of T_2.

MOD2

Corresponds to the function of MOD1. In addition, the parameter "s_start" is activated. If the position of the machine changes during time T_2 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 T_1 and deactivated with the expiration of T_2.



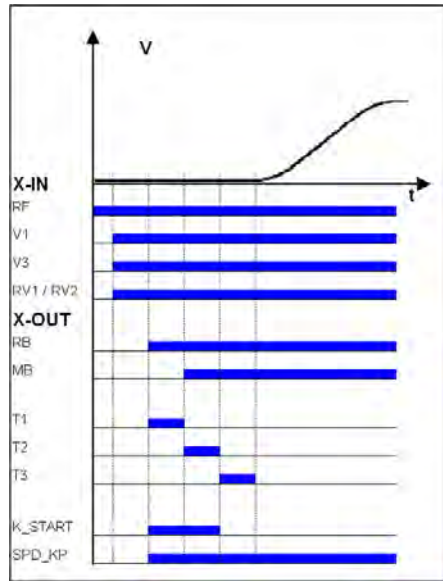
MOD5 (standard setting for synchronous motors)

The machine is position controlled. The machine position is recorded until expiration of T_2 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 T_1 and deactivated with the expiration of T_2

MOD4

Corresponds to the function of MOD5. In addition, the parameter "s_start" is activated. If the position of the machine changes during time T_2 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".

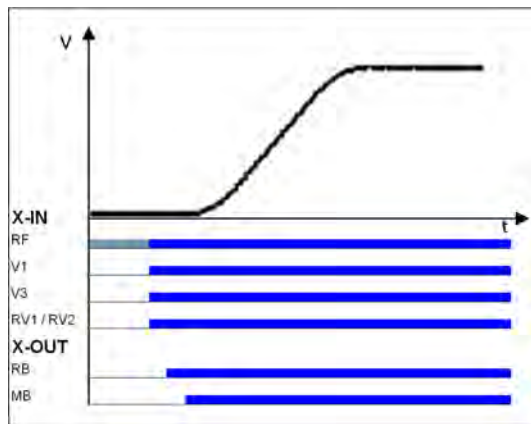
Start-up variations



- 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

12.4 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/s². A higher value causes greater acceleration and thus a steeper ramp
- R_POS1:** Setting the lower round off. A higher value causes a softer round off
- R_POS2:** Setting the upper round off. 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" in case motor contactors are used.
- The brakes must be switched instantaneously with the digital output "MB"

12.5 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 | 0.01 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 |

12.6 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 travel speeds V_3 or V_2 the input for the travel speed V_1 must be applied (see diagram "Normal stop at distance-dependent deceleration").

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!**



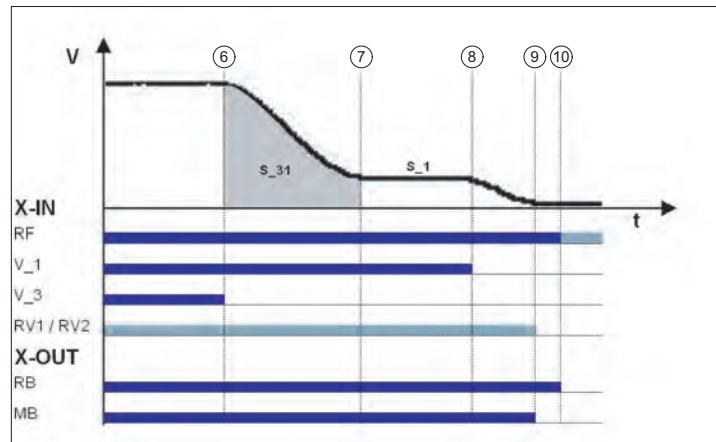
Information

If the high travelling speed signal is briefly switched off (e.g. V_3), the frequency inverter slows down the motor to the positioning speed V_1. For safety reasons, further actuation of a greater travelling speed is ignored. A greater travelling speed may only be actuated once all inputs for the travelling speeds have been switched off and once the motor has reached the speed 0.

12.6.1 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 |
|-----------|---|

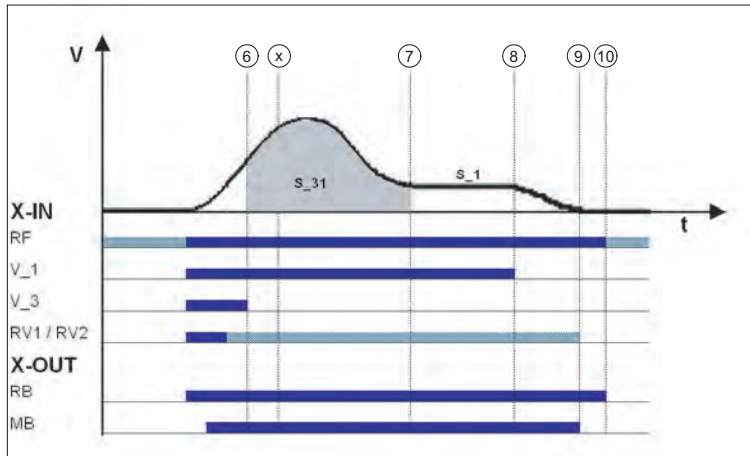


Normal stop during path dependent deceleration
RF Controller enable
V_1 Positioning speed
V_3 Travel Speed
RV1 / RV2 Direction default
RB Controller ready
MB_Brake Mechanical brake

12.6.2 Arch travel with path-dependent deceleration

If the selected final speed (*V_2* or *V_3*) is not reached with short floor clearances, the ZETADYN 4 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 <i>V_1</i> . |
| 8 | Positioning speed <i>V_1</i> 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 $V_3 \leftrightarrow V_1$ (S_31) and the crawl path $V_1 \leftrightarrow \text{speed } 0$ (S_1, only with DCP 1/DCP 3) are identical.

12.7 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:

- $V_3 \leftrightarrow V_1$
- $V_2 \leftrightarrow V_1$

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.

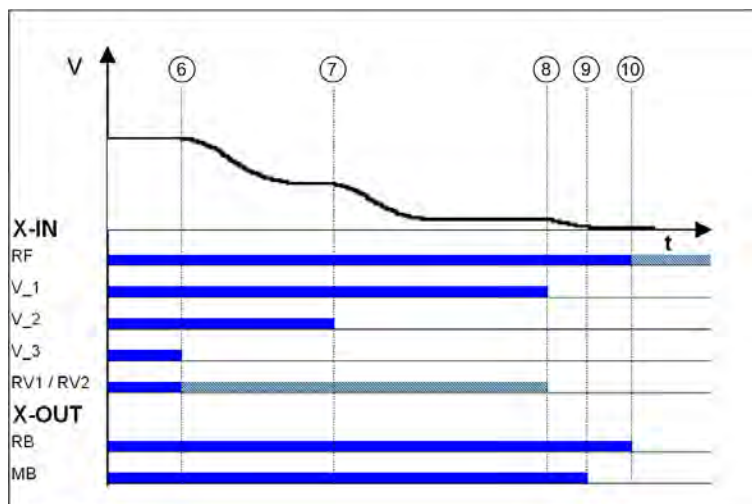


Information

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.

12.7.1 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 |

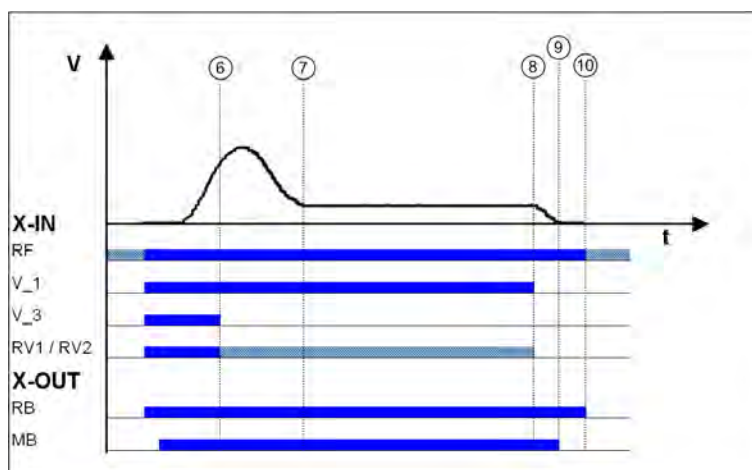


Time-dependent deceleration with reached traveling speed

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

12.7.2 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!

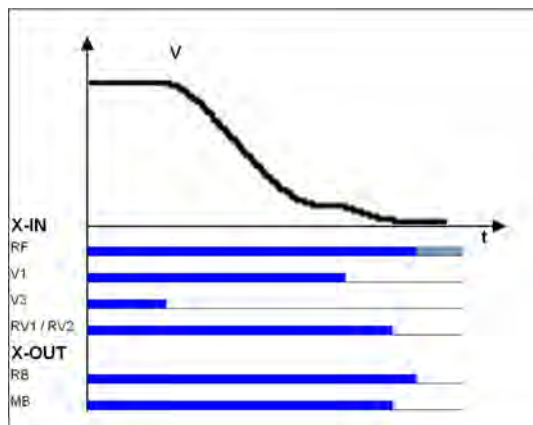


Information

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

12.8 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^2 . A higher value causes greater deceleration and thus a steeper ramp.
- R_NEG1:** Setting the upper round off. A higher value causes a softer round off.
- R_NEG2:** Setting the lower round off. A higher value causes a softer round off.



Information

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

12.9 Crawl path optimization

Improvement of:

- too long crawl paths with traveling speed V_1
- non-flush stopping due to V_1 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.

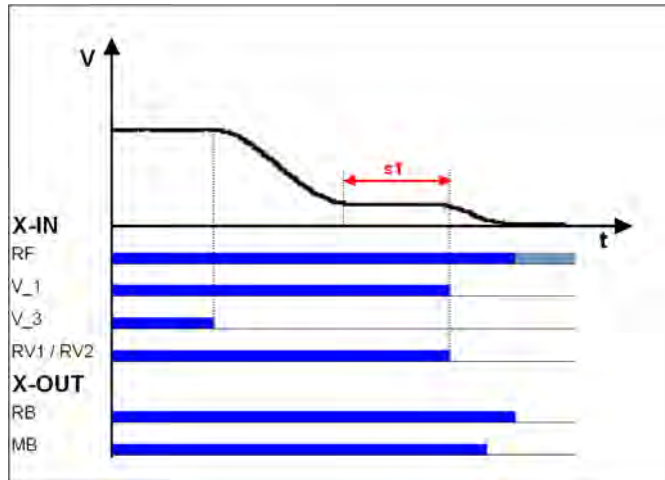
Optimizing the crawl paths

| | |
|---|---|
| 1 | <p>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.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <pre>Dist. ----- 03 sa: 0.00 s21 0.52m sr: ^0.00 s31: 1.45m s1: 0.00 sd: 0.52m</pre> </div> |
| 2 | <p>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.</p> |
| 3 | <p>In the Decelerating menu, change the values for "S_DI3" or "S_DI2" to that determined for s1</p> |
| 4 | <p>Check the deceleration behaviour and correct the values for the parameters "S_DI3" or "S_DI2" if necessary.</p> |



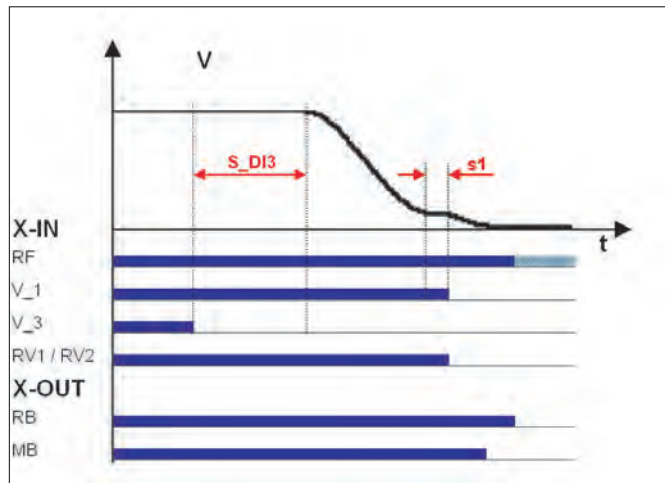
Information

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



Deceleration with non-optimized crawl path

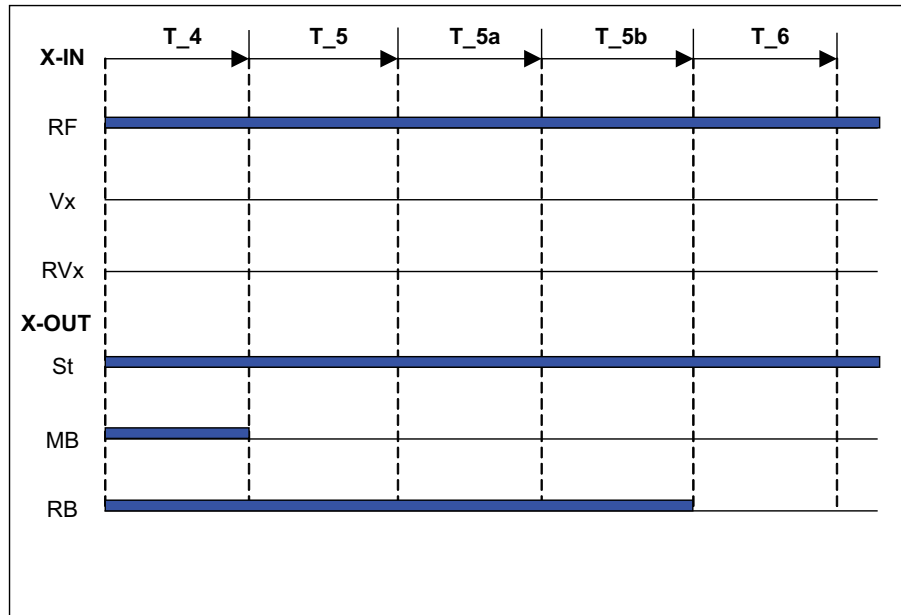
RF Controller enable
 V_1 Positioning speed
 V_3 Travel Speed
 RV1 / RV2 Direction default
 RB Controller ready
 MB_Brake Mechanical brake



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

12.10 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 various times can be set in the **Stop** menu.

Time optimization through brake monitoring

If the brake monitoring is activated (menu **Monitoring/BR≠Off**) and the monitor contacts are connected, time T_5 is optimized. As soon as the brakes are closed, time T_5 is aborted and time T_5b started.

Time optimisation through contactor monitoring (optional)

If the contact monitoring is activated (menu **Monitoring/CO=ON**) and the monitor contacts are connected, time T_6 is optimized. As soon as the contactors are open, time T_6 is aborted and the stopping sequence ends.

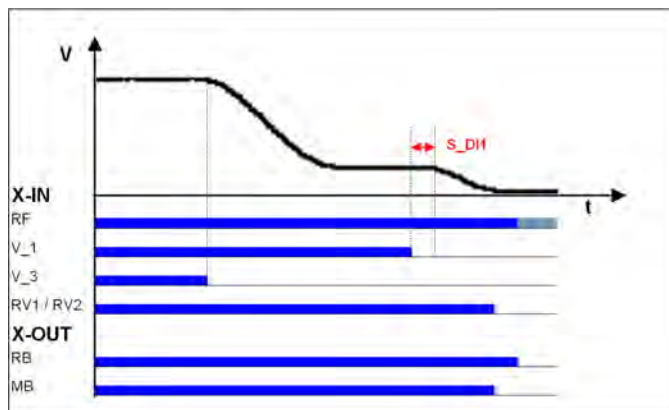
12.11 Optimizing the step alignment

| | |
|---|--|
| 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 behaviour and, if necessary, correct the value for the parameter "S_DI1". |



Information

If there are different distances to the flush alignments, it is not possible to travel flush to all floors by modifying the parameter "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

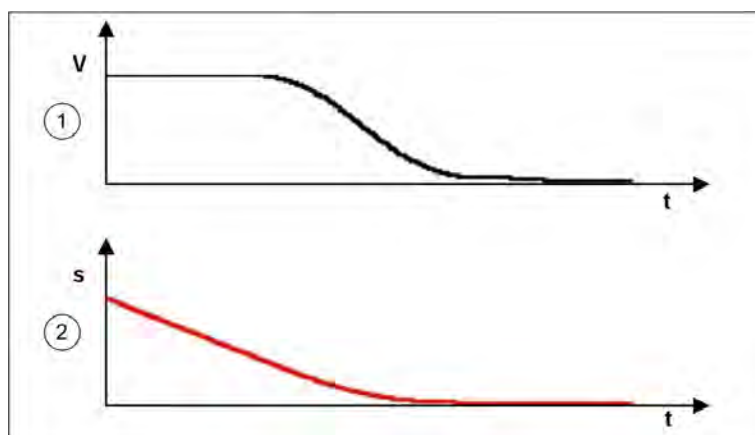
12.12 Direct leveling



Information

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

During direct leveling, the control system predetermines the ZETADYN 4 the residual path to be traveled up to the stopping point.
 The frequency inverter slows down the motor in accordance with the specified remaining distance, making it possible to travel to the stop area without a creep path.



Direct leveling with DCP protocol
 1 Travel speed *V_3*
 2 Residual distance

12.13 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.

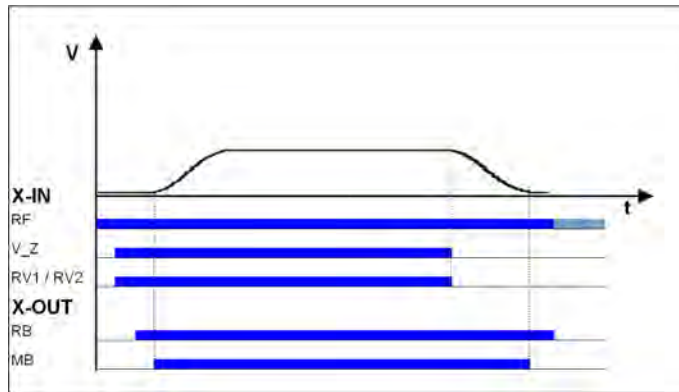
To be able to make a readjustment, at least the following input signals need to be present:

- 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
RV1 / RV2
X-OUT Controller ready
RB Controller ready
MB_Brake Mechanical brake

12.14 Operation in idle

With the ZETADYN 4C frequency inverter, both synchronous as well as asynchronous motors can be operated in an idle state.

CAUTION!

Caution!

S 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%.

```
Control
↳ SPD_KP 1.00
  ↳      0.10
Speed controller basic
gain
```

12.15 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.

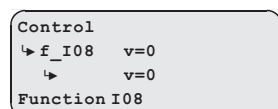


Information

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.

12.15.1 Actuation

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



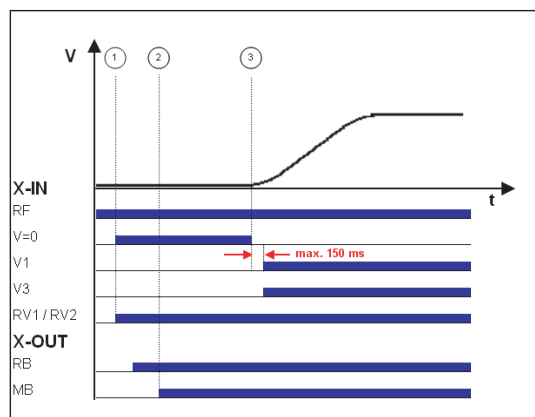
| | Standard | DCP |
|---|--|--|
| 1 | <p>Cabin door closing</p> <p>Actuation of inputs:</p> <ul style="list-style-type: none"> RF - Controller enable RVx - Default for travel direction v=0 - Hold speed 0 <p>Activation of output:</p> <ul style="list-style-type: none"> RB - Controller ready <p>Motor contacts must be switched without a delay. Motor energized</p> | <p>Cabin door closing</p> <p>Setting the bits by lift control:</p> <ul style="list-style-type: none"> G2 - RPM 0 B1 – travel command B2 – off switch B3 – travelling speed B4 – travel direction <p>Setting the bits by ZETADYN 4</p> <ul style="list-style-type: none"> S1 – travel active <p>Motor contacts must be switched without a delay. Motor energized</p> |
| 2 | <p>Activation of output:</p> <ul style="list-style-type: none"> MB – mechanical brake <p>Motor brake must be opened without a delay. Motor speed is controlled to 0.</p> | <p>Setting the bits by ZETADYN 4</p> <ul style="list-style-type: none"> S6 - mechanical brake <p>Motor brake must be opened without a delay. Motor speed is controlled to 0.</p> |
| 3 | <p>Cabin door is closed</p> <p>Deactivation of input:</p> <ul style="list-style-type: none"> v=0 - Hold speed 0 <p>Actuation of inputs:</p> <ul style="list-style-type: none"> V1 - Positioning speed or V2 - Intermediate speed or V3 - travel speed <p>Travel speeds must be actuated no more than 150 ms after input "v=0" has been deactivated!</p> | <p>Cabin door is closed</p> <p>Setting the bits by lift control:</p> <ul style="list-style-type: none"> G6 - Intermediate speed or G7 – fast speed B3 – travelling speed <p>Cancelling the bits by lift control:</p> <ul style="list-style-type: none"> G2 - RPM 0 <p>Travel speeds must be actuated no more than 150 ms after input "v=0" has been deactivated!</p> |



Caution!

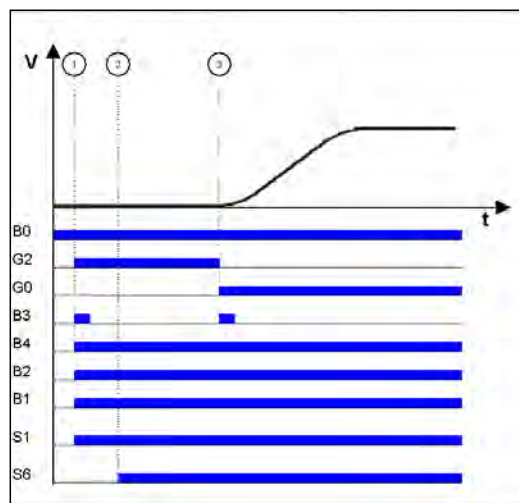
Danger from traveling with cabin door open!

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

12.15.2 Monitoring functions for Quickstart

- If the drive is maintained at speed 0 for longer than 20 s, the frequency inverter enters fault mode and displays **ERR780/Quickst. t-limit**
- If the input signal "Maintain speed 0" is set during travel, the frequency inverter enters fault mode and displays **ERR781/Quick. during travel**
- If the motor moves by more than ± 7 mm with the input set to speed 0, the ZETADYN 4 goes to fault mode, displaying **ERR529 / Quickstart Alarm**
- The monitoring time for the rotary encoder (T_GUE) is started after the function "Speed 0" has been switched off

13 Emergency evacuation

13.1 Evacuation with 1-phase mains supply 230V AC



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.



Information - Characteristics of evacuation with single-phase mains supply:

- Evacuation in motoric and generatoric direction
- Load-independent starts
- Load-independent stopping
- Flush stopping

In the event of a mains failure, the mains supply must provide the following voltage to the frequency inverter:

- 230 VAC to feed L1 and L2

The ZETADYN 4 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

Size of the voltage supply

The required performance consists of the following:

Power consumption electronics ZETADYN 4

- + Control system power 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 [W]**



Information

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

13.1.1 Parameterisation

(1) The following prerequisites must be present:

The direction of travel of the car is downwards with

| Standard | DCP |
|--|------------------------------------|
| 24 V 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
↳ f_I08  PARA2
  ↳      PARA2
Function I_08
```


In case of a voltage drop (power failure), the configured input with 24 VDC is actuated in order to inform the frequency inverter that a switchover must be made to parameter set 2

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

| Standard | DCP |
|--|---|
| <p>Configure digital output in the Control system menu to Evac. Dir.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <pre>Control ↳ f_04 Evac.Dir ↳ Evac.Dir Function 04</pre> </div> <p>Contact open ◊ Car is lighter than counterweight Evacuation trip will be carried out upwards!</p> <p>Output closed ◊ Car is heavier than counterweight Evacuation trip will be carried out downwards!</p> | <p>Status byte 2, Bit 2 = 0 ◊ Car is lighter than counterweight Evacuation trip will be carried out upwards!</p> <p>Status byte 2, Bit 2 = 1 ◊ Car is heavier than counterweight Evacuation trip will be carried out downwards!</p> |

(4) Evacuation type default

Configure the parameter **F_PARA2 = EVA. 1*AC** in the **Parameter set 2** menu.

```
Parameter set 2
↳ F_PARA2 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.

13.2 Evacuation with UPS



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 ZETADYN 4 analyses the load ratio between the car and the counterweight. In case of a voltage drop (mains failure), the ZETADYN 4 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

13.2.1 Evacuation through UPS with optimum power



Information - 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:

- Power consumption electronics ZETADYN 4
- + Control system power 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.

13.2.2 Evacuation through UPS with minimum power



Information - 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:

- Power consumption electronics ZETADYN 4
- + Control system power 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.

13.2.3 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
↳ f_I08 PARA2
  ↳ PARA2
Function I_08
```

In case of a voltage drop (power failure), the configured input with 24 VDC is actuated in order to inform the frequency inverter that a switchover must be made to parameter set 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. <pre>Control ↳ f_O4 Evac.Dir ↳ Evac.Dir Function O4</pre> 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 parameter set 2
```

(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 resistance (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 of the UPS
```

Calculating the available UPS power:

```
X1 rating plate
- Control system power 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!

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

CAUTION!

(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

```
Start-up
↳ T_3 0.0 s
  ↳ 0.0
Maintain speed=0
```

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

```
Start-up
↳ T_4 0.0 s
  ↳ 0.0
Maintain speed 0
```

13.3 Improving the positioning

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.

13.3.1 Parameterisation

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

```
Parameter set 2
↳ STOP ON
  ↳ ON
Stop function
```

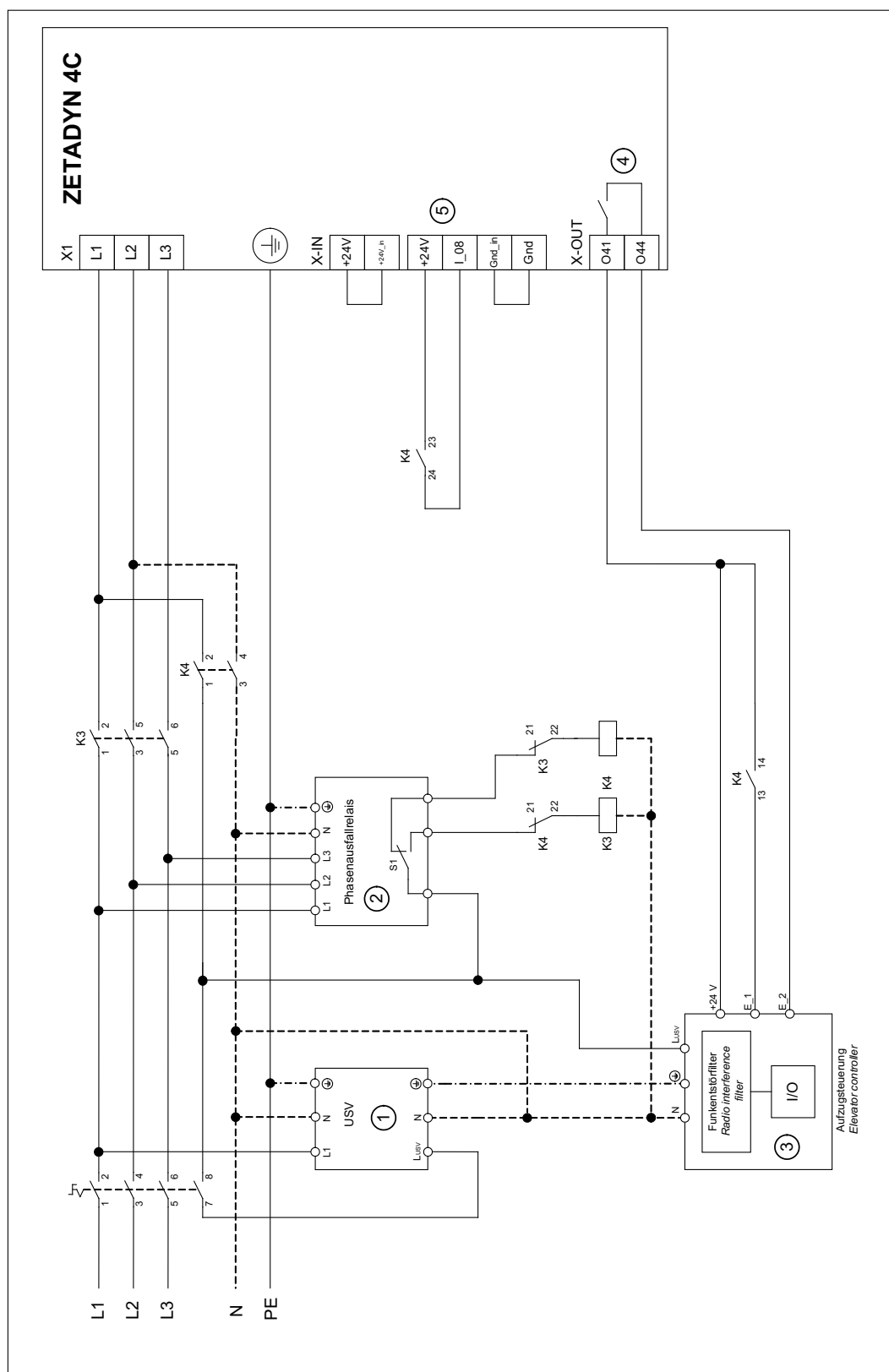
| Standard | DCP2 / DCP4 |
|---|---|
| Configure in the Parameter set 2/STOP = ON menu Brake is already closed when the switch off for the speed V_1 is reached. | Determine overshoot path at the flush position under full load Set parameters in the Control/DCP_STP = ... mm menu <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <pre>Control ↳ DCP_STP 35 mm ↳ 35 Stop prior to flush</pre> </div> The brakes are already closed when the distance to the flush position preset by S_Stop is reached. |



Information

The positioning is still load-dependent despite this measure. When travelling at half load, the elevator can stop too early outside the door zone range with **parameter set 2/STOP = ON**.

13.4 Connection diagram for UPS to ZETADYN 4C



- 1 Uninterruptible power supply
- 2 Phase failure relay
- 3 elevator control system
- 4 Output parameterised 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

13.5 Emergency evacuation by opening the brakes

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.

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.

- If the ZETADYN 4 is operated without contactors, the short-circuit is made by the internal short-circuit of the ZETADYN 4.
- If the ZETADYN 4 is operated with contactors (optional), the short circuit is made by external contactors.

CAUTION!

Caution!

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

13.5.1 Monitor function

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

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

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

Activating of the monitoring function

- Switching off the ZETADYN 4
- activate the digital input with the "Monitoring" function
- Switch on the ZETADYN 4
- Monitoring function is active

| | |
|---|---|
| <pre>Elevator monitor Speed: 0,2 m/s Direction: up ▲ Distance: +1.2 m</pre> | <p>Elevator-Monitor</p> <p>Speed: Display of the actual evacuation speed</p> <p>Direction: Display of the actual evacuation direction ▲ Evacuation speed < Limit V_G1 ▲▲ Evacuation speed > Limit V_G1</p> <p>Distance: Display of the evacuation distance past</p> |
|---|---|



Information

During activated monitor function, all further functions of the ZETADYN 4 are locked!

14 Error diagnosis

14.1 Travel abort and acknowledgement during malfunctions

14.1.1 Travel abort

If the ZETADYN 4 detects an error, the actual travel program is aborted and following outputs are switched off immediately:

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

The open loop control must immediately:

- Close the electromechanical brake
- STO- interruption or opening of 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.

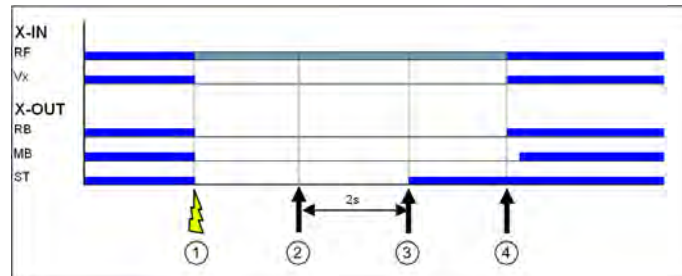
14.1.2 Acknowledgement

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 if traveling signals are applied before the expiration of the 2 seconds.

The following errors are not automatically acknowledged:

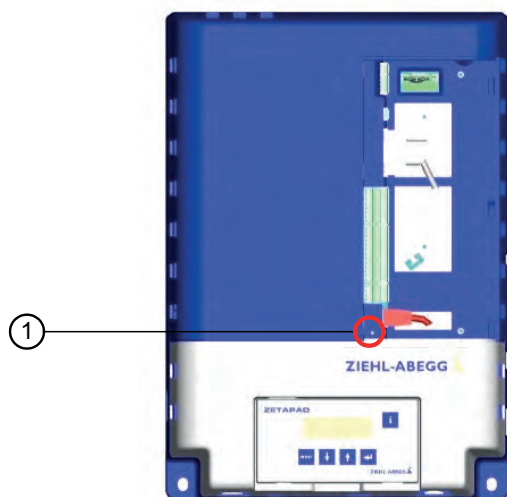
| Error no. | Acknowledgement by |
|-------------|---------------------------------------|
| 900 ... 999 | Switch ZETADYN 4 off and then back on |



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

14.2 LED

A LED is available to diagnose the ZETADYN 4. The LED lights in various colours.



1 LED position

Status of the ZETADYN 4 with standard activation

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

Condition of the DCP connection

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

Condition of the CAN connection

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

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

14.2.1 Software update

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

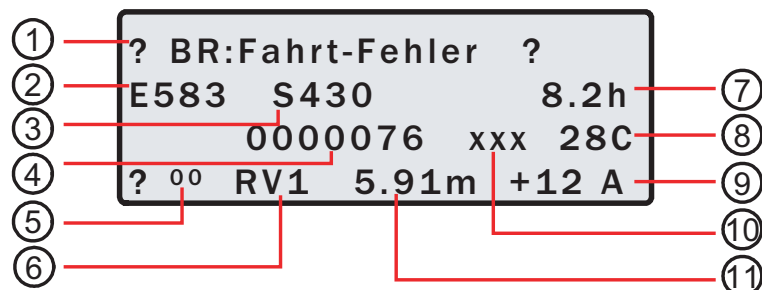
An explanation of the flash code can be found in the chapter Special Functions/Software Update

14.3 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.

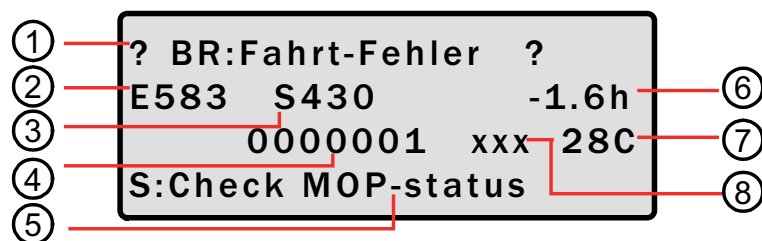
Once the number of 64 messages has been reached, the oldest entry in each case is deleted for each new error message which arises. When the fault list is called up, the last fault which occurred is displayed with the following information:



- 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 Temperature power stage
- 9 Motor current consumption
- 10 Additional information (option)
- 11 Position of the car in the shaft

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

The following information is displayed when the error list is opened and the **0** key is pressed additionally:



- 1 Error description
- 2 Error no.
- 3 Operation condition (S=status)
- 4 Indication how many trips ago the error occurred
- 5 Status in which the error occurred is in plain text
- 6 Time how long ago the error occurred
- 7 Temperature power stage
- 8 Additional information (option)

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 opening time is displayed

```

> BC:Alarm/fault ◀
E912 S422 -2.4h
-0000189 12C
> 01 RV1 0.00m +12A
    
```

In CANopen lift and DCP operation, the time at which an error occurs is saved in the error list and displayed.

```

? BR:Fahrt-Fehler ?
E583 S430 10:30
0000076 xxx 28C
? 00 RV1 5.91m +12 A
    
```

1 Time at which the error occurred

14.4 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)

14.5 Error list

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

14.5.1 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 the column n **M**.

CAUTION!

Caution!

The mask function may only be used for troubleshooting and error diagnostics. The corresponding error cause must be eliminated in order to ensure continuous service of the frequency inverter!

Sequential errors can occur if errors are masked.

The masking deactivates important monitoring functions. This may result in dangerous operating states or damage to the frequency inverter.

14.5.2 Block function

Blocks the controller if certain errors occur several times in succession. The errors must occur in directly consecutive travel tests. The fault counter is set to 0 when performing a trouble-free run. 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: Lock function after 2 malfunctions. Output "ST" remains dropped after the 2nd error
 - Lock n.1: Lock function after 1 malfunction. Output "ST" remains dropped after the 1st error
- Errors which lead to disabling of the ZETADYN 4 are marked by a **dot** in the **S** column.

14.5.3 Notes 0xx

Information about:

- Error memory content
- Changes in the operating conditions
- Application of special frequency 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 | | |

14.5.4 Error 1xx

- Hardware configuration error
- Software error

| Error no. | Error text | Error cause | M | S |
|------------|--------------------|---|---|---|
| 100 | Serial no. missing | Frequency inverter/CU does not have a serial number, e.g. after a component replacement | | • |
| 101 | System-Error | A defective internal component was identified during a self-test of the frequency 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. of the extension card for the rotary encoder was not detected: extension module 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 Print do not match | | |
| 160 | ADC adj.:outside tol. | Error: 2The deviation between the first measured value and the second measured value during the zero point comparison of the motor current measurement is greater than 2 %. | • | |
| 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 configured as the actuation type. This is not possible during operation without a rotary encoder Remedy: Enter DCP1 or DCP3 for the communication | • | |

14.5.5 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: Rotary encoder type and motor type are not compatible Remedy: Enter the correct rotary encoder type in the "Encoder & BC" menu | • | • |
| 211 | No binary encoder | Error: Binary resolution not configured for rotary encoder type TTL sinu or EnDat/SSI Remedy: Enter a binary resolution (e.g. 512, 1024 or 2048) | | |
| 213 | ZR_EN /ZR_RDY missing | Error: "ZR_RDY" or "ZR_EN" was not configured Remedy: Set digital input to "ZR_RDY" or set digital output to "ZR_EN" | | |
| 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 | • | • |

| Error no. | Error text | Error cause | M | S |
|-----------|----------------------|---|---|---|
| 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 | • | • |
| 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 | | |
| 240 | ZR:Not RDY | Error: At start of travel, no signal present at the digital input set to "ZR_RDY" Remedy: Check wiring Use the ZArec display to check for an error at the ZArec Exit ZArec configuration level | | |
| 270 | Cable change warning | Error: Information travel direction change counter Replacement of the cables in about 1 year | | |
| 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 "Travelling" 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 set 2" menu, copy the the data from parameter set 1 to parameter set 2 | | • |

14.5.6 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: Perform a software update | • | • |
| 303 | MOP: SW-Error | Error: Software error message in the motor management processor Remedy: Perform 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 Remedy: Check the connector of the Shunt-Modul Current sensors are defekt | • | • |
| 310 | No abs.enc | Error: Connected absolute value encoder not detected (no absolute value encoder connected when frequency inverter was switched on) Remedy: Check absolute value encoder connection Switch frequency inverter off and then back on Parameter im Menü "Encoder & BC" überprüfen | | • |

| Error no. | Error text | Error cause | M | S |
|-----------|-------------------|--|---|---|
| 315 | EnDat: HW-error | Error: EnDat encoder delivers error | | • |
| 316 | EnDat: Resolution | Error: Configured resolution in the EnDat encoder does not match the EnDat encoder resolution Remedy: Configure the correct EnDat encoder resolution in the "Encoder & BC" menu | | • |
| 320 | ENC: Error-start | Error: Configured sinusoidal encoder was not detected Remedy: Check connection Check the rotary encoder type; possibly connect an encoder with rectangle signals | • | • |
| 321 | EnDat: ULP-error | Error: While starting, an error was read out from the EnDat encoder. Error is stated as a code: 0: faulty EnDat encoder power supply 1: no SSI communication 2: faulty EnDat encoder lighting 3: defective signal amplitude 4: Positioning error 5: defective sine evaluation Remedy: Check connection, check EnDat encoder | | |
| 322 | EnDat: Com-Fehler | Error: During start, malfunction in communication to EnDat encoder; absolute value could not be read out Remedy: Check EnDat encoder, Check rotary encoder line Check the rotary 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 SSI encoder, Check rotary encoder line Check the rotary encoder configuration in the "Encoder & BC" menu | | |
| 325 | SSI: Timeout | Error: Faulty communication with SSI encoder during start-up; absolute value could not be read out, SSI encoder does not reply Remedy: Check SSI encoder, Check rotary encoder line Check the rotary 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 absolute value encoder Check rotary encoder line Check rotary encoder connection (e.g. shielding) | | |
| 328 | ENC: Count-Dif | Error: Excessive difference between the position determined by the absolute value encoder and the position calculated from the absolute value encoder impulses Remedy: Check absolute value encoder Check rotary encoder line Check rotary encoder connection (e.g. shielding) | | |
| 329 | ENC:Sinus-Error S | Fault: Plausibility between sine and cosine track of sinus encoder unsatisfactory Remedy: Check sinus encoder Check rotary encoder line Check rotary 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 sinus encoder Check rotary encoder line Check rotary encoder connection (e.g. shielding) | | |

| Error no. | Error text | Error cause | M | S |
|-----------|--------------------|---|---|---|
| 331 | ENC: Error NDEF | Error: Start-Bit of the EnDat-protocol is not detected Remedy: Check EnDat encoder Check rotary encoder line Check rotary 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 are both zero Remedy: Check absolute value encoder Check rotary encoder line Check rotary encoder connection | | |
| 372 | ENC:No Abs.value | Error: Absolute values cannot be read in by the rotary encoder prior to starting travel Remedy: Check rotary encoder connection | | • |
| 373 | ENC:No Abs.End | Error: Absolute values cannot be read in by the rotary encoder prior to starting travel Remedy: Check rotary encoder connection | | • |
| 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 continuous 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: Frequency 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: Frequency inverter has not received any initialisation data from the control (for 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 | • | • |

14.5.7 Error 4xx

- Abort travel to protect the ZETADYN 4
- 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 at the frequency inverter output for short-circuit, Check rotary encoder connection for connection of rotary 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 rotary encoder connection | • | • |
| 420 | MP: Temp. Fault | Error: Excess heat in the power stage Remedy: Check the fan, check the ambient temperature, When installing the frequency 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 rotary encoder connection | • | • |
| 450 | MP: Overload! | Error: Nominal current of the frequency inverter was exceeded for 10 s by a factor of 1.8 Remedy: Check motor data Check calculation Check the weight compensation | • | |
| 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 frequency inverter design, Check the motor data Voltage drop during the travel Check the input phases | • | • |
| 471 | DC: U > UDC_MAX | Error: Intermediate circuit has undercut the permissible value for "UDC_MAX" (Menu "Power section") during travel Remedy: Check the setting for the "UDC_MAX!" value in the "Power section" menu, Check the connection / functioning of the brake chopper / brake resistor Parameter im Menü "Encoder & BC" überprüfen, Check the size of the Brake-Chopper / Brake-Resistor, | • | • |
| 475 | DC: U > 850 V | Error: During travel, the intermediate circuit voltage exceeds 850 VDC 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" | | • |

| Error no. | Error text | Error cause | M | S |
|-----------|----------------------------------|---|---|---|
| 480 | MP: Overcurrent! | Error: In one motor phase, overcurrent was measured Remedy: Check the motor connection (short-circuit, earth fault), Check rotary 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 | | • |
| 485 | Intermediate circuit overcurrent | Error: Overcurrent was measured in the intermediate circuit Remedy: Check the motor connection (short-circuit, earth fault), Check rotary encoder connection, Check brake chopper/brake resistor connection, Check the "SPD_KP" parameter in the "Control system" menu, | | • |
| 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 rotary 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 | | • |

14.5.8 Error 5xx

- Trip abort to protect the installation
- Speed monitoring
- STO function monitor
- Contactor monitor (optional)
- 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: Rotary encoder sinus signal was detected at standstill Additional information: The maximum output voltage of the frequency inverter was reached at the time of the error Remedy: Check the brake functioning Check rotary encoder connection | • | • |
| 503 | No starting | Error: No rotary encoder signal was received after expiration of the time T_ENC (T_ENC is started with T_2) Remedy: Check rotary encoder function, Check rotary 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 | • | • |
| 504 | ENC: Sig.Int. | Error: Frequency inverter does not receive a rotary encoder signal at a target speed >10 cm/s Remedy: check motor connections (U ↔ U; V ↔ V; W ↔ W), Brake not closed during start, Check the motor data Check rotary encoder connection, Increase the "SPD_KP" parameter in the "Control system" menu, | • | • |

| Error no. | Error text | Error cause | M | S |
|------------|---------------------|---|---|---|
| 505 | MB/ENC fault | Error: Frequency inverter does not receive a rotary encoder signal at a target speed >10 cm/s 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 rotary encoder connection, Increase/reduce the "SPD_KP" parameter in the "Control" menu | • | • |
| 506 | X_ENC15:Discon. | Error: Rotary encoder signal interruption during travel Remedy: Check rotary 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 rotary encoder resolution 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 rotary encoder resolution 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 rotary encoder connection, Check the rotary encoder impulses in the "Info" menu, page 11, Check the brake lifting Check motor data in the "Motor name plate" menu, Check the rotary encoder resolution in the "Encoder & BC" menu, Increase "SPD_KP" amplification in the "Controller" menu | • | • |
| 520 | Wrong direction | Error: Machine moves more than 12 cm in the wrong direction Remedy: Check rotary encoder connection, Check the rotary encoder configuration in the "Encoder & BC" menu, check the motor connections (U ↔ U; V ↔ V; W ↔ W) Frequency inverter design too small | • | • |
| 522 | ENC: Dif. Pos | Error: Excessive positive difference between the rotary encoder counter statuses of two sampling steps. The limit value corresponds to double the nominal system speed Remedy: Check whether the car counterweight is pulling up, Check motor data in the "Motor name plate" menu, Check the rotary encoder resolution in the "Encoder & BC" menu, Check the "SPD_KP" parameter in the "Control system" menu, Check the motor connection | • | • |
| 523 | ENC: Dif. neg | Error: Excessive negative difference between the rotary encoder counter statuses of two sampling steps. The limit value corresponds to double the nominal system speed Remedy: Check whether the car counterweight is pulling up, Check motor data in the "Motor name plate" menu, Check the rotary encoder resolution 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 sinus encoder, Check the optional board for rotary encoder connection, Check the rotary encoder type in the "Encoder & BC" menu, | • | • |

| Error no. | Error text | Error cause | M | S |
|-----------|-----------------------|--|---|---|
| 529 | Quickstart alarm | Error: During a quick start function, the machine moves more than 7 mm 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) | • | • |
| 530 | STO: remains | Error: At the start of travel there is no signal at the STO_A and STO_B inputs at the end of the time T_SDLY. Remedy: Check activation of the STO inputs | • | |
| 531 | STO: Interruption | Error: STO input signals are interrupted for longer than 200 ms during travel Remedy: Check activation of the STO inputs, check safety circuit | • | |
| 532 | STO: missing | Error: At the end of travel there is still a signal at the STO_A and STO_B inputs at the end of the time T_SDLY. Remedy: Check activation of the STO inputs | | |
| 533 | STO: Fault | Error: The status of the STO A and STO B signals was different for longer than 120 ms. Remedy: Check activation of the STO inputs | • | |
| 534 | STO: No travel signal | Error: At standstill (no travel signal) the STO inputs were set and there was no valid travel signal within the time T_SDLY. Adjustment: Check activation of the STO inputs, check safety circuit, check activation of the travel signals | | |
| 535 | ZR:RDY abort | Error: The signal at the digital input set to "ZR_RDY" drops out during travel Remedy: Use the ZArec display to check for an error at the ZArec | | |
| 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 Info: In case of a contactor monitor break, the inputs that triggered the error are displayed in the "Additional information" field (1: CO1, 2: CO2, 3: CO1 and CO2). | | • |
| 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: Use the control to check the evaluation of the frequency inverter output signal | • | |
| 545 | CO open early | Error: Motor contactors are open during travel Remedy: Check the motor contactor triggering Check the safety circuit Info: In case of a contactor monitor break, the inputs that triggered the error are displayed in the "Additional information" field (1: CO1, 2: CO2, 3: CO1 and CO2). | • | |
| 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 Info: In case of a contactor monitor break, the inputs that triggered the error are displayed in the "Additional information" field (1: CO1, 2: CO2, 3: CO1 and CO2). | | • |

| 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. | • | |
| 570 | PFU: Fault | Error: Monitor contact of the power feedback unit opens during ZETADYN 4 operation Remedy: Check connection of the feedback unit function monitor, Check feedback unit function monitor | | • |
| 571 | PFU:Stdbymains in place | Error: PFU is not yet active 1 s after start of travel | • | |
| 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 rotary 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 | | |

| Error no. | Error text | Error cause | M | S |
|-----------|----------------|---|---|---|
| 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 | • | • |

14.5.9 Error 7xx

- Travel abort due to communication errors between ZETADYN 4 and control

| 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 ?!! | 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" | • | • |

14.5.10 Error 8xx

- Errors which can occur in operation with CANopen Lift

If an error occurs during operation with CANopen, the frequency inverter runs through status "ST_Delay" and finally goes to status "Check ST release". The frequency inverter remains in this status until the control 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 and/or rotary encoder missing or does not occur at the set times. Adjustment: 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 sends commands to the frequency inverter in the wrong order. Adjustment: Take care to the right order in CAN drive cycle | • | |

| Error no. | Error text | Error cause | M | S |
|-----------|-------------------------|---|---|---|
| 830 | CAN: Timeout Enab.-Det. | Error: Control system gives command "Enable Operation" not within T_CMD Adjustment: Increase time for T_CMD | | |
| 831 | CAN: Timeout Dis. Op. | Error: Control system gives command "Disable Operation" not within T_CMD Adjustment: Increase time for T_CMD | | |
| 832 | CAN: Timeout Shut-down | Error: Control system gives command "Shutdown" not within T_CMD. Occurs by closing the brakes. Adjustment: 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. Adjustment: 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 | | |

14.5.11 Error 9xx

- Fatal errors which can only be acknowledged by switching off the ZETADYN 4

| Error no. | Error text | Error cause | M | S |
|-----------|------------------|--|---|---|
| 905 | MOP:HW-SW Error | Error: Hardware or software error occurred after switch-on. After 60 s, the frequency inverter switches 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 | | |
| 906 | ZR_ERR by start | Error: No signal at BC input during ZETADYN 4 start-up Remedy: Check wiring Use the ZAreC display to check for an error at the ZAreC | | |
| 908 | PFU: No function | Error: When switching on the frequency inverter, the monitor contact of the power feedback unit is not closed Remedy: Check connection of the feedback unit function monitor, Check feedback unit function monitor | | • |
| 910 | BC: No function | Error: When switching on the frequency inverter, the monitor 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 continuous braking power of the Brake resistor is exceeded by 150 % within 120 s The frequency inverter switches off during travel Remedy: Check the configuration of the BR-type Check the connected BR | | • |
| 912 | BC: Fault | Error: Monitor contact for brake chopper or brake resistor opens during frequency inverter operation Remedy: Check the temperature monitor for the Brake-Chopper or Brake resistor, check the temperature monitoring for the Brake-Chopper or Brake-Resistor, | | |

| Error no. | Error text | Error cause | M | S |
|-----------|---------------------|---|---|---|
| 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 | • | |
| 914 | X-ENC15:Miss. | Error: No rotary encoder detected at X-ENC15 when switching on the frequency inverter Remedy: Check rotary encoder connection, Reset frequency inverter | | |
| 916 | X_ENC15:Discon. | Error: Rotary encoder signal interruption during travel Remedy: Check rotary encoder connection, Switch frequency inverter off and then back on | | |
| 917 | BRxx activ | Error: The internal Transistor for the brake resistor is still triggered 5,5 s after travel-end | • | |
| 918 | MP:Temp.missing | Error: Temperature detector on power stage is not supplying any measurements Remedy: Change the device Check fuse on SP board | | • |
| 919 | ZR:ERR by opera. | Error: Signal at BC input drops out during travel Remedy: Use the ZARec display to check for an error at the ZARec | | |
| 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 4C there is one additional drive possible. | | • |
| 960 | STO: Diagnostic | Error: The status of the STO A and STO B signals was different for at least 310 ms so that the internal diagnostic unit performed a switch-off. Adjustment: Check activation of the STO inputs. Error can only be reset once the ZETADYN 4 is switched off. | • | • |
| 961 | STO: Hardware | Error: Internal hardware error Adjustment: Error can only be reset once the ZETADYN 4 is switched off. | • | • |
| 991 | MOP: Timeout | Error: The communication between the processors was interrupted or the communication between the processors is faulty during travel. Remedy: Make sure that the EMC regulations are observed (see chapter "Electrical Installation / EMC-conform Installation") | • | • |
| 994 | MOP: Timeout 2 | Error: I standstill the communication between the Motor-Management-Processor (MOP) and the Application-Processor (APP) is interrupted 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 absolute value encoder Check the optional board for rotary encoder connection Error can only be reset once the ZETADYN 4 is switched off. | • | • |

14.5.12 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 positioning 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-signment?" 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. |

14.6 Operating modes of the ZETADYN 4

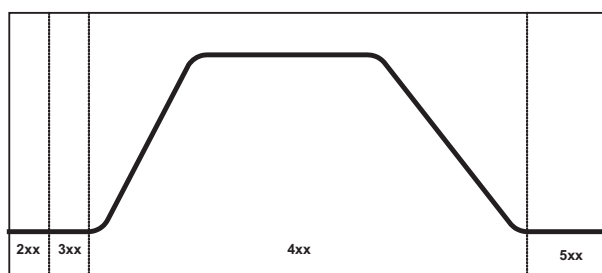
The frequency inverter software divides the operating curve into various sections. Each of these sections is assigned a status number that refers to a defined service condition.

If an error occurs, the status number is stored with the error number in the error list.

Furthermore, the operating conditions are displayed with the status number and in plain text in the **Info/Page02** menu.

| status | Condition of the frequency inverter | status | Condition of the frequency 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) |
| 280 | Wait until STO is switched off (inputs STO_A and STO_B set) | 530 | Wait until motor contactors switched off (T6) |
| 300 | Wait until motor contactors switched on (T0) | 535 | Travel interrupted due to interruption of the controller enable RF |
| 305 | Checking the motor phases | 536 | Travel interrupted due to interruption of the contactor monitor COx |
| 310 311 | A Build-up of magnetic field in the motor (T1) | 538 | Wait until STO is switched on (inputs STO_A and STO_B reset) |
| 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 |

| status | Condition of the frequency inverter | status | Condition of the frequency inverter |
|--------|---|--------|---|
| 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) | 996 | Wait until ZETADYN 4 is switched off for error acknowledgement |
| 424 | Rounding up and linear delay from V2 (distance-dependent) | 997 | Frequency converter is in stand-by mode |
| 425 | Rounding down of the delay from V2 (distance-dependent) | 998 | Wait until ZETADYN 4 is switched off |




Travel curve with related status numbers

14.7 Frequent startup problems

| Problem | Cause | Adjustment |
|---|--|---|
| ZETADYN 4 does not start after switching on | Brake resistance is connected to the +DC and -DC terminals on terminal X1/X3 | Brake resistance is connected to the +DC and R terminals on terminal X1/X3 |
| ZETADYN 4 stands still in status 40 during start procedure, the fault message relay of output O11-O14 does not pull up, the menu cannot be operated | Input voltage is too low | Check the frequency inverter input voltage |
| | One phase on the line connection is missing | Check wiring of the line connection |
| Motor does not reach nominal speed (comparison of actual and nominal speed visible in the Info menu on page 04) | Half load adjustment is not correct | Check half load adjustment and correct if necessary |
| | Settings in the "Motor Rating Plate" and "System Data" menus are not correct | Check settings in the "Motor Rating Plate" and "System Data" menus (the value of the "n*" parameter in the "System Data" menu may not be much greater than the value of the "n" parameter in the "Motor Rating Plate" menu) |
| | Motor data are not correct | |

14.8 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.

```
Monitor
↳ APC      ON
  ↳        ON
Auto. parameter via
```

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.

14.9 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".

```
Statistics
↳ APD      OFF
  ↳        ON
Automatic parameter
```

15 Energy saving

15.1 ZETADYN 4 standby function

To save energy at standstill, the ZETADYN 4C can be switched to standby mode. Internal components of the ZETADYN 4 are switched off in standby mode. This means that the ZETADYN 4 has a much lower power loss at standstill. There are two standby modes in the ZETADYN 4C: Standby 1 and Standby 2

Standby 1:

In Standby 1 mode, the rotary encoder, monitoring functions and the output relay remain active,

Standby 2:

In Standby 2 mode, the rotary encoder is switched off, the monitoring functions are not active and all relays are switched off, including the fault indication relay.

15.1.1 Activate Standby 1 or Standby 2 mode



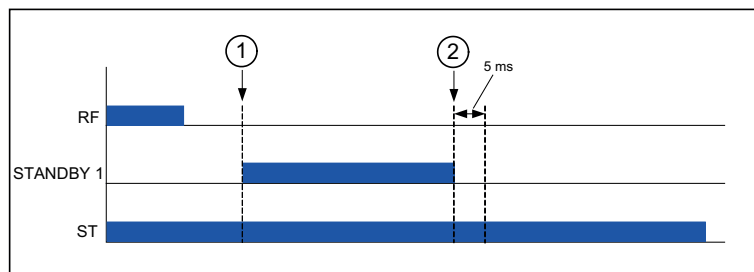
Information

It is only possible to switch to Standby 1 or Standby 2 mode when the controller enable (input CE) is switched off.

Set digital input in the **Control** menu to **STANDBY1** or **STANDBY2**.

```
Control
└─ f_I08 STANDBY1
   └─ STANDBY1
Function I08
```

5 ms after deactivation of the digital STANDBY1 input the ZETADYN 4 is ready for operation again (see diagram).



Function stand-by 1 mode ZETADYN 4C

1 STANDBY1 input is activated

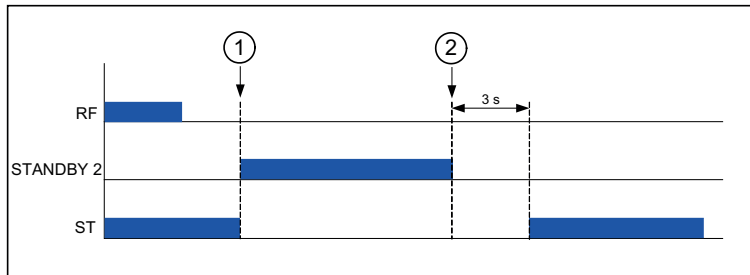
2 STANDBY1 input is activated

RF Controller enable

STANDBY1 Input with STANDBY 1 function

ST Fault

3 s after deactivation of the digital STANDBY2 input the ZETADYN 4 is ready for operation again. The ST fault output is activated (see diagram).



Function stand-by 2 mode ZETADYN 4C
 1 STANDBY2 input is activated
 2 STANDBY2 input is activated
 RF Controller enable
 STANDBY2 Input with STANDBY 2 function
 ST Fault

15.2 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!

15.2.1 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 | | | | |

15.2.1.1 Activation of stand-by mode

Set digital output (preferably f_05) in the **Control** menu to the **PFU** function.

```
Control
↳ f_05 PFU
↳ PFU
Output function 05
```

To switch the power feedback unit to stand-by mode the input A2 of the power feedback unit must be disconnected from GND!

Deactivation of the digital output PFU:

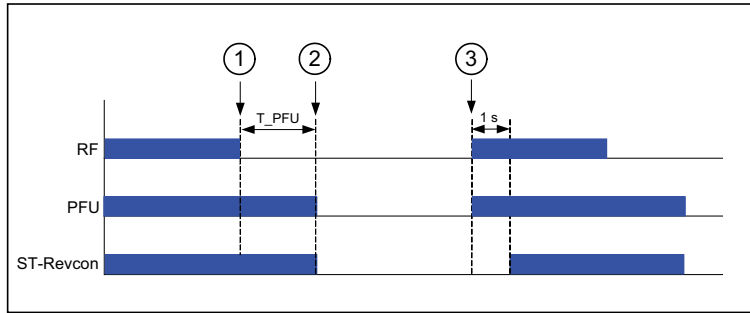
- Power feedback unit switches to standby mode

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
Waiting time PFU PWM
```

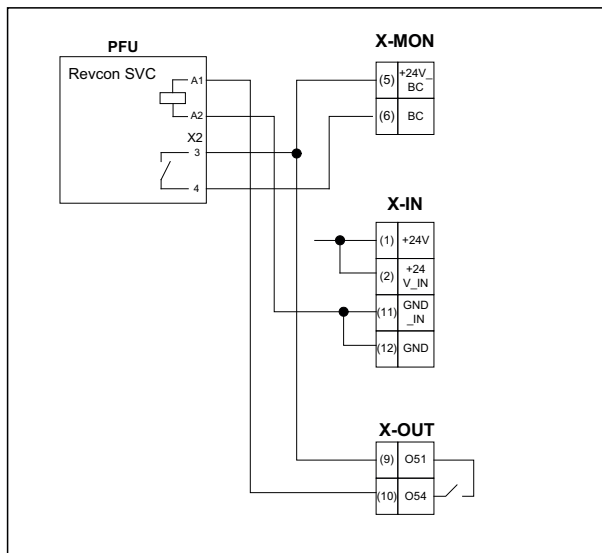
If the parameter **T_PFU** is set to **0s**, the output PFU is always active. Standby is now deactivated.

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

15.2.1.2 Electrical connection stand-by mode



Connection Revcon power feedback unit with stand-by mode

15.2.1.3 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!

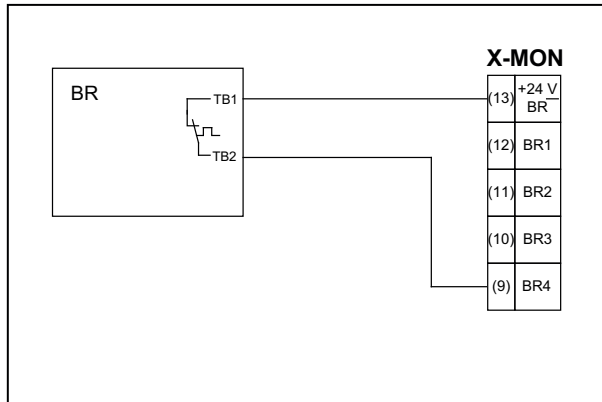
The combination power feedback unit + brake resistor must be entered in the **Encoder & BC/BC_Typ** menu

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

Connection and parameterisation temperature monitor brake resistance

The temperature monitor is connected to a digital input (X-IN or X-BR). The input must be parameterised to the **PFU_BR** function.

```
Control  
↳ f_XBR4 PFU_BR  
↳ PFU_BR  
Function input BR4
```



Connection brake resistor

16 Special functions

16.1 Changing the Clock frequency


The factory setting of the ZETADYN 4 switching frequency depends on the size and the motor type:

| Size | Synchronous motor | Asynchronous motor |
|--|---|---|
| ZETADYN 4xx011 ZETADYN 4xx013 ZETADYN 4xx017 ZETADYN 4xx023 ZETADYN 4xx032 | Clock frequency 16 kHz auto (Parameter M_PWM=Auto) | 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 ZETADYN 4.

CAUTION!

Caution!

Increasing the clock frequency causes

- a performance reduction of the ZETADYN 4 (see Technical Data chapter)
- a greater heat dissipation and thus increased heating of the ZETADYN 4

The service life of the ZETADYN 4 is negatively influenced by the higher temperatures.

16.1.1 Fixed presetting of the clock frequency (Menu Power section/M_PWM=Fix f_PWM)

The cycle frequency of the ZETADYN 4 is 8 kHz after setting at the factory. This can be changed, if necessary, in the **Power Unit/f_PWM** menu continuously between 2.5 ... 10 kHz.

16.1.2 Automatic adjustment if the clock frequency (Menu Power section/M_PWM=Auto)

The frequency inverter works with the switching frequency configured in the **Power component/f_PWM_H** menu.

If required, the frequency inverter switches to the switching frequency configured in the **Power component/f_PWM** menu.

16.2 Rotary encoder calibration

CAUTION!

Caution!



Rotary encoder calibration must be performed when a synchronous motor is in operation. Operating the motor without rotary encoder calibration 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 no longer necessary to calibrate the absolute value encoder!

Options for calibrating an absolute value encoder

The ZETADYN 4 ZETADYN 4C offers two different methods of calibrating the absolute encoder:

- **load-free** calibration of the absolute value 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)

16.2.1 Load-free alignment SSI-Encoder

While the SSI encoder is being calibrated, the ZETADYN 4 energises the motor with direct current. In the process, the rotor jumps to the centre of the nearest magnetic pole. In this rotor position, the SSI encoder must be manually calibrated to its zero point. In order to make assembly easier, it is recommended that you connect the SSI encoder to the ZETADYN 4 prior to assembly and calibrate the offset value "0" (value in the **ENCODER calibration/ENC_POS** menu). Subsequently mount the SSI encoder, if possible without any twisting, in the position in which the locking screw is easily accessible.



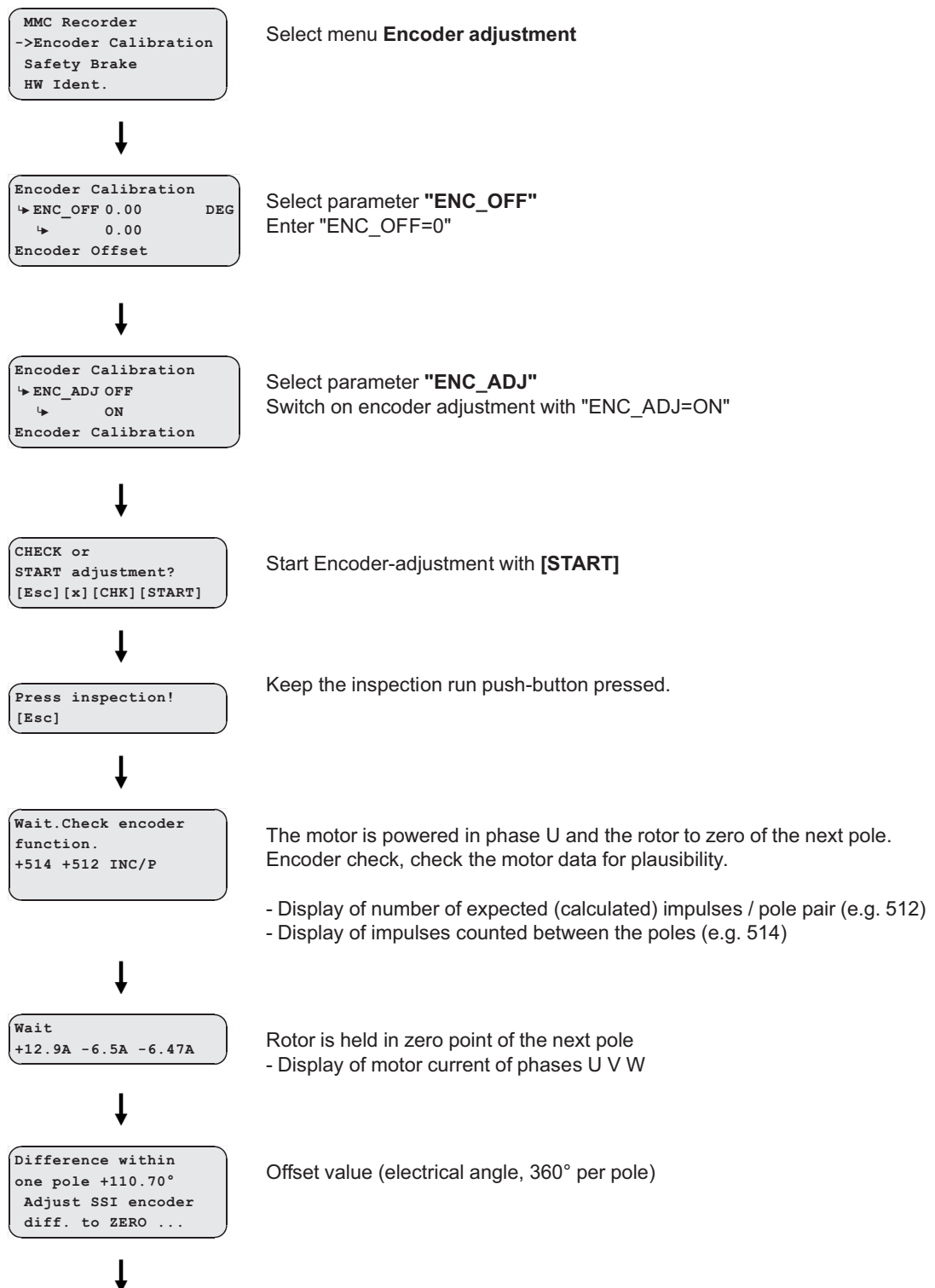
Information

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 SSI encoder terminal screw is not accessible in the "ENC_POS = 0" position, the SSI encoder can be calibrated 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



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 Calibration  
↳ 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]
```

16.2.2 Load-free alignment EnDat-Encoder

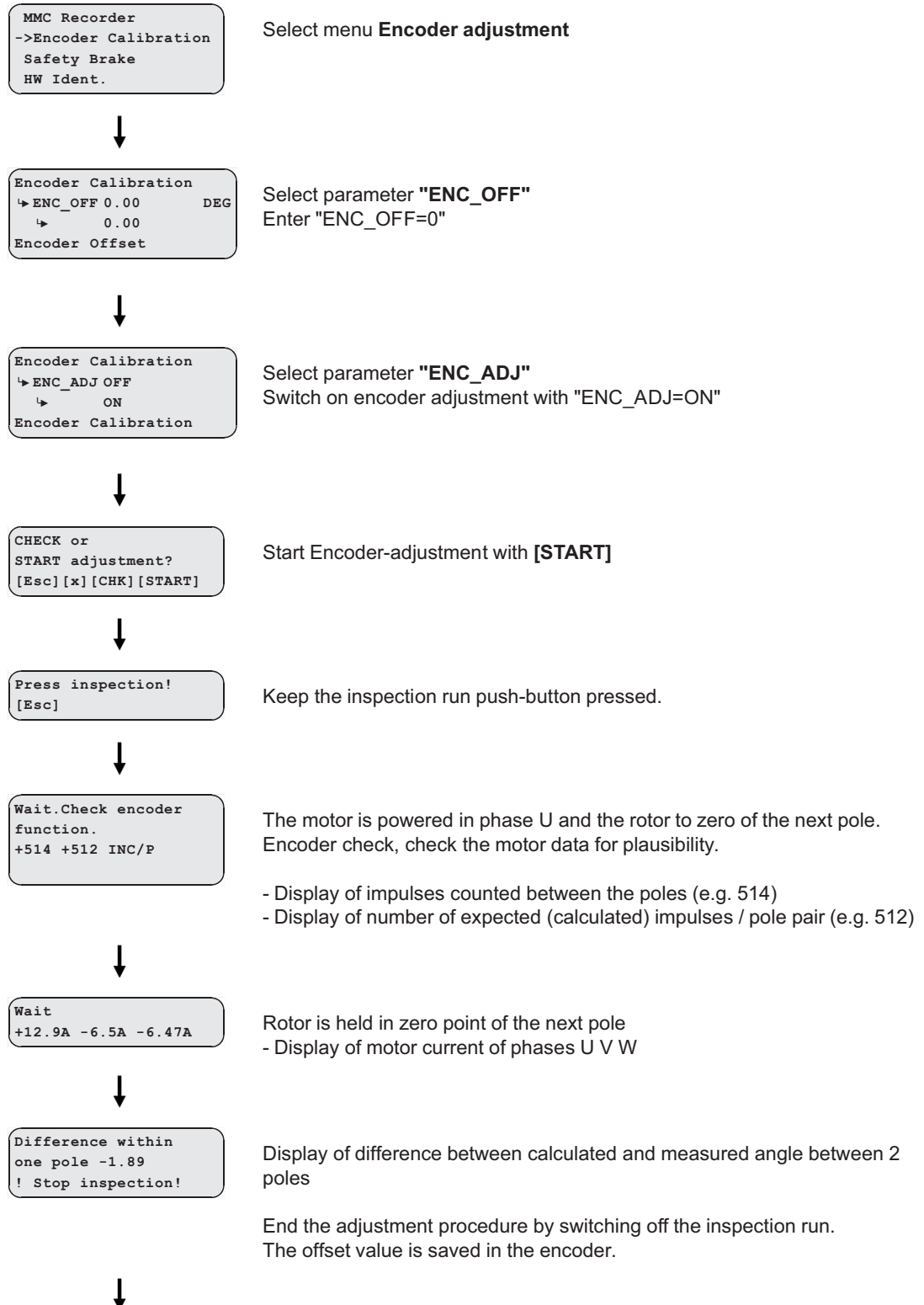
While the EnDat encoder is being calibrated, the ZETADYN 4 energises the motor with direct current. In the process, the rotor jumps to the centre of the nearest pole. In this rotor position, the offset value is saved to the EnDat encoder and the EnDat encoder is subsequently set to position "0".



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



```
Encoder adjustment
was successfully
finished
[EXIT]
```

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

While the rotary encoder calibration is being checked, the ZETADYN 4 energises each individual pole with direct current. The offset is determined at each pole and the averaged offset is calculated. This offset can be saved in the ZETADYN 4.



Information

The offset determined during the check is not saved in the ZETADYN 4 because if the frequency inverter is replaced, the new frequency inverter will not use the same rotary encoder offset. A new rotary encoder offset must be performed, or the old rotary encoder offset must be entered.



Information

During the rotary encoder offset, the driving disk must turn to the right (when looking at the driving disk). Once the calibration is complete, the driving disk must be located in the same position as at the start of the process.

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 **/4CX/DEVICE/Seriennummer/LST**.

Carrying out the checking of the encoder offset

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

Select menu **Encoder adjustment**



```
Encoder Calibration
↳ENC_OFF 0.00 DEG
↳ 0.00
Encoder Offset
```

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



```
Encoder Calibration
↳ENC_ADJ OFF
↳ ON
Encoder Calibration
```

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
```



```
WAIT 0/0A 36C
|| - - - - -80°
ACT >> prog:+15859
POL:2 real:+15859
```

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: Current encoder position within a pole



```
Stop inspection!
[Esc]
```

Release inspection run push-button



```
ERR_AVG: -1.42°
ERR_MAX: +0.37°
Optimum
ENC_OFF: 1.10° [OK]
```

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)

16.2.4 Rotary encoder calibration with closed brake

If the rotary encoder is calibrated with the brake closed, there is no need to take the cable off the driving disk. This allows calibration to be performed with much less effort.

CAUTION!

Caution!

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



Information

Considerable noise may occur at the motor for approx. 10-15 s during calibration. These noises are caused by the special current supply to the motor and are normal for this kind of rotary encoder calibration. Please keep the button for the inspection travel still closed!

CAUTION!

Caution!

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 Calibration
Safety Brake
HW Ident.
```

Select menu **Encoder adjustment**



```
Encoder Calibration
↳ ENC_OFF 0.00      DEG
↳      0.00
Encoder Offset
```

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



```
Encoder Calibration
↳ ENC_ADJ OFF
↳      ON
Encoder Calibration
```

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



```
CHECK or
START adjustment?
[Esc] [x] [CHK] [START]
```

Start check with the **⏏** key.



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

Disconnect electrical connection of the mechanical brake.
 Confirm with the **⏏** key.



```
Press inspection!
[Esc]
```

Keep the inspection run push-button pressed for approximately 2 minutes.



```
*Set test current
0 8.8A 23V
```

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



```
Stop inspection !
```

Release inspection run push-button



```
*Result: 2.7A
132-222 -> 176/ 356
ENC_ABS=263
ENC_OFF=356 [END]
```

Result of the adjustment is displayed (176 / 356)
 If ENC_OFF = ? is displayed, it is not possible to determine the correct Encoder Offset. In this case one of the two results (176 or 356 in the example) is correct. It is recommended to move the motor shaft to a different position by briefly releasing the brake and to repeat the calibration. If correct calibration is still not possible, a test run must be made with both of the received results. With one result the motor runs error-free, with the other result uncontrolled movements of the motor can occur!



```
Save new ENC_OFF?
[no] [yes]
```

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

16.2.5 Alignment absolute encoder type ERN1387

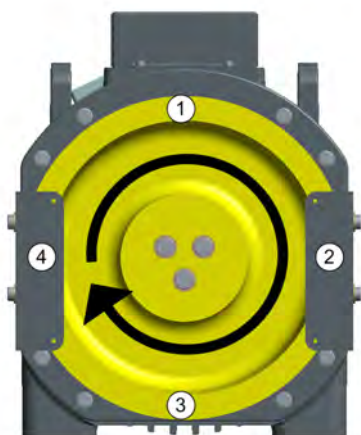
The calibration of absolute value encoders of type ERN1387 corresponds to calibration with brake closed.



Information

To minimise inaccuracies when determining the position, the absolute value encoder calibration must be performed **4 times** with the brake closed!

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



Absolute value encoder calibration positions

Carry out encoder calibration type ERN1387

```
* Result: 2.7A
144-228 -> 186/ 6
ENC_OFF= 6 [END]
```

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



$$ENC_OFF = \frac{ENC_OFF_1 + ENC_OFF_2 + ENC_OFF_3 + ENC_OFF_4}{4}$$

Calculating the average offset



```
Encoder Calibration
↳ ENC_OFF 6.00 DEG
↳ 6.00
Encoder Offset
```

Enter mean offset in parameter "ENC_OFF"
 in the menu "Encoder-adjust"

16.2.6 Error messages during absolute value encoder calibration

| 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 I _u < 200 mA I _v , I _w < 100 mA |
| 06 | No encoder impulses | No rotary encoder impulses Rotary 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 absolute value encoder calibration is started |
| 40 | CO1 does not turn on | Contact 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 | Absolute value encoder error, absolute value cannot be written to the absolute value encoder memory |
| 61 | Adj.did not store | Encoder error, absolute value not saved in absolute value encoder |
| 70 | BR1..4 are activ | Brake opens when carrying out an encoder calibration with closed brake |
| 71 | Check nominal power! | Motor data are not correct |

16.3 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.

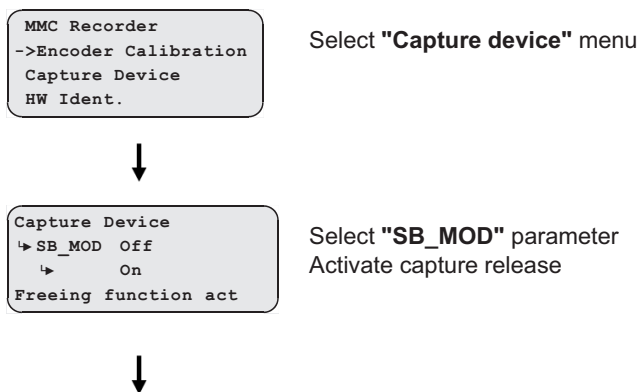
In order to provide the maximum power, the clock frequency of the pulse width modulation is reduced during the safety-brake function time.

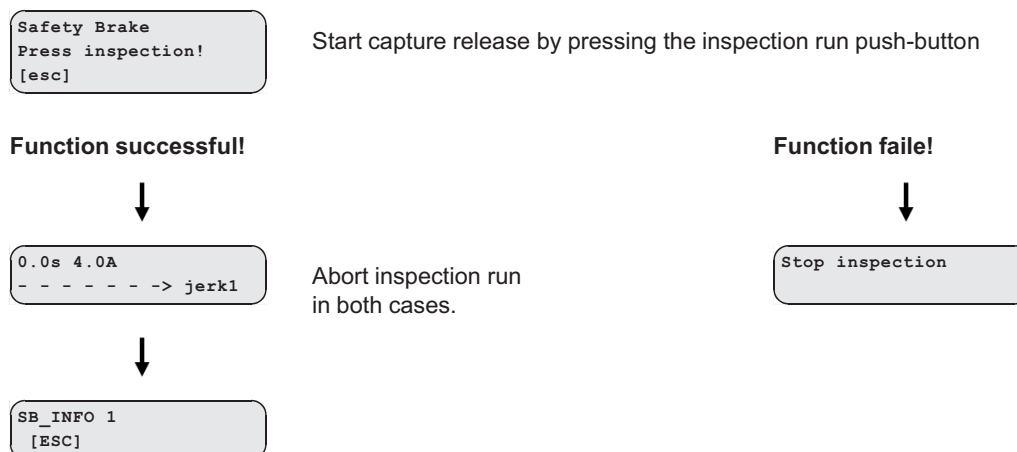
CAUTION!

Caution!

Do not repeatedly carry out the safety brake function because that can destroy the ZETADYN 4.

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 | Absolute value could not be read out from the absolute value encoder. Check encoder cable. |
| 10 | Asyemtric motor current. Difference over 12.5%. Check motor phases / contactors. |
| 30 | The brake monitor indicates that the brakes are open, although the frequency inverter has not yet opened 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 |

16.4 Reset

Allocating the parameters of the ZETADYN 4 with the standard values or customer specific system data.

The works setting is made by a numeric input in the **Statistics/RESET** menu.

Reset-functions:

| Reset-No. | Effect |
|-----------|---|
| 77 | Pre-parameterised ZETADYN 4: Parameters are assigned customer-specific system data Standard ZETADYN 4: Parameters will be set with standard data |
| 90 | deleting of: <ul style="list-style-type: none"> • Parameter • Error list • Error messages Parameters will be set with standard data |
| 99 | deleting of: <ul style="list-style-type: none"> • Parameter • Error list • Error messages • Encoder-Offset "ENC_OFF" (will be set to 0) Parameters will be set with standard data |

CAUTION!

Caution!



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 rotary encoder calibration 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 allocated 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).

16.5 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 ZETADYN 4 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)



Information

The LED of the ZETADYN 4 lights blue when the ZETADYN 4 is accessing the memory card.

16.5.1 Software update

If a software update becomes necessary, you can carry it out using a memory card (SC/MMC).

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



Caution!

Carry out a supervised inspection trip after completing the update!

16.5.1.1 Software update with the ZETAPAD operating terminal

Perform a software update

- ▷ Insert the memory card in the X-MMC card slot on the controller unit (see figure bottom right).

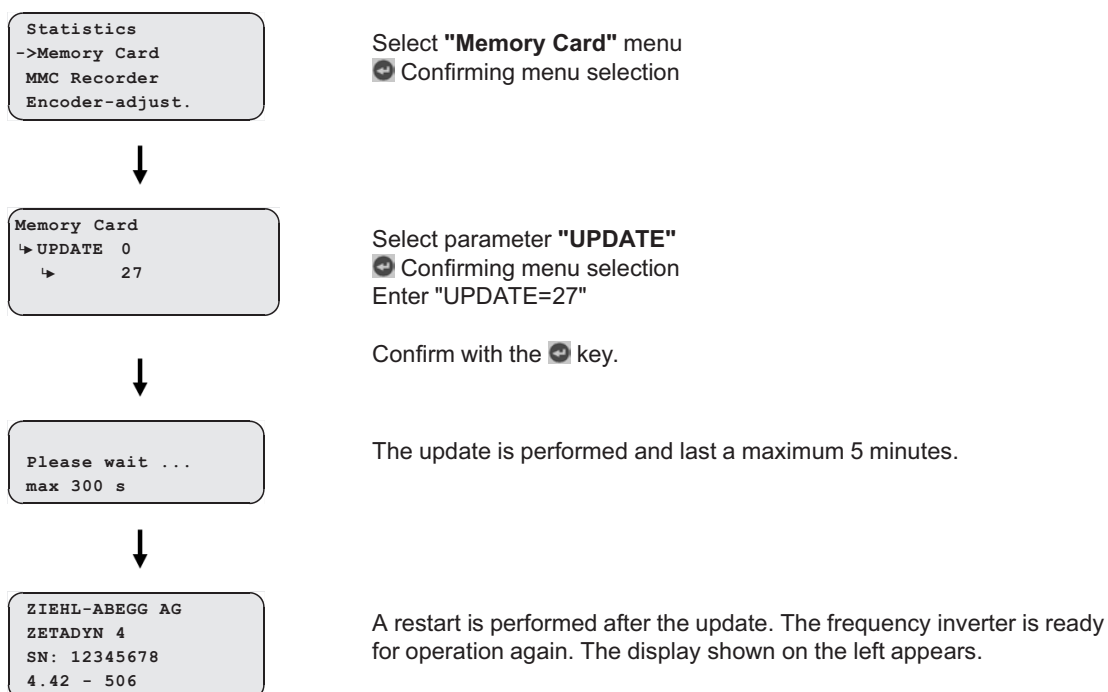
A software update cannot be made with the card slot on the ZETAPAD! Do not insert the memory card in the card slot of the ZETAPAD!



Memory card in card slot of the ZETAPAD

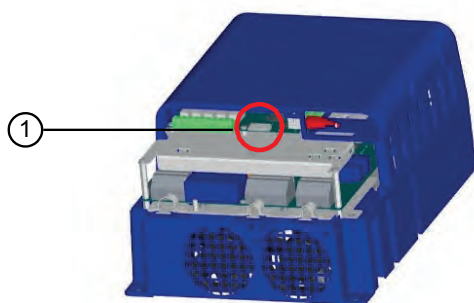


Memory card in the X-MMC card slot



16.5.1.2 Software update 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 (see Fig.).
3. Switch on the main switch. The frequency inverter starts again.
4. After the LED illuminates yellow for the first time, remove the memory card and then reinsert it. You must complete this procedure within 5s (watch for fast flash code of the LED).
5. The Update starts (duration max. 300s).
6. Following another automatic reset, the ZETADYN 4 is once more ready for operation.

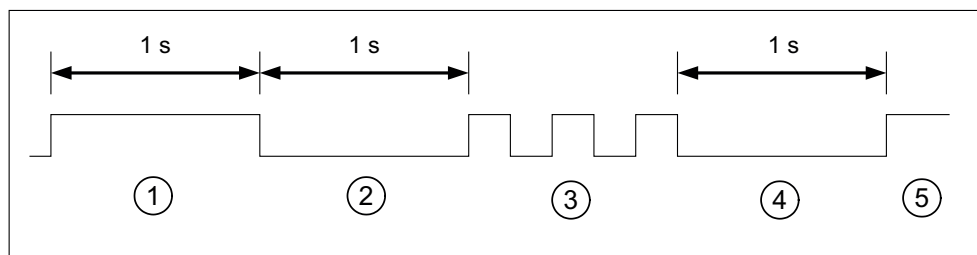


1 X-MMC card slot position

16.5.1.3 Error flash code during a software update

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

☞ See the "Error Diagnostics / Light Emitting Diodes" chapter for the position of the LED.



- 1 white glow (1 s)
- 2 Break (1 s)
- 3 Slowly flashing (Number of pulses corresponds to the error message in the table below)
- 4 Break (1 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 to 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 |

16.5.2 Saving parameters

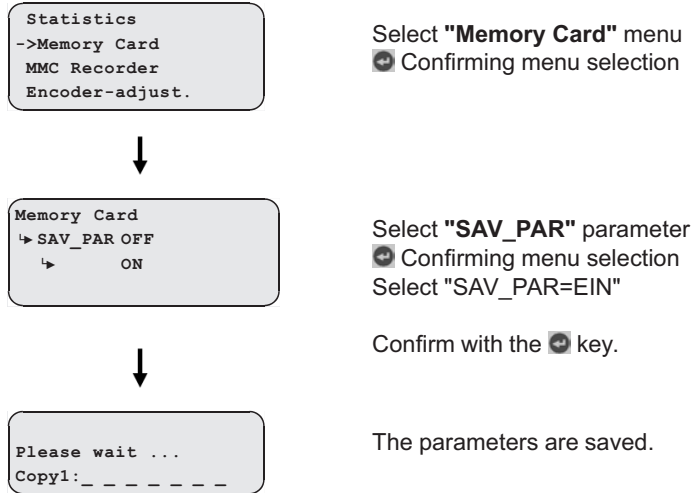
The parameters of a frequency inverter can be saved to the memory card.



Information

You can only save the parameters of **one** frequency inverter to the memory card. It is not possible to save the parameters of multiple frequency inverters.

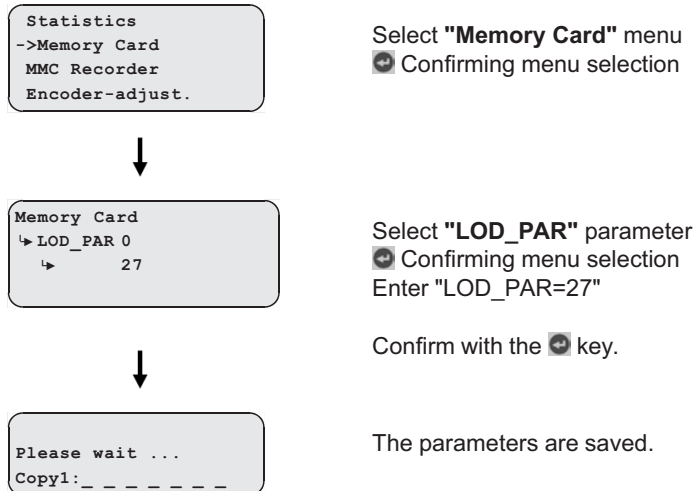
Saving parameters



16.5.3 Loading parameters

With identical systems, the saved parameters of a frequency inverter can be loaded into the frequency inverters of the other systems.

Loading parameters



16.5.4 Saving parameters lists, printer lists and error lists


Parameter lists, printer lists and error lists can be saved on the memory card with allocation of the ZETADYN 4 serial number.

The following folder structure is created on the memory card: **"4CX\DEVICE\serial number"**. The "LST" and "PAR" folders are created in the "Serial Number" folder. The error lists and printer lists are saved in the "LST" folder, the parameter lists are saved in the "PAR" folder. The lists are named according to the actual number of runs at the time of the data backup (e.g. "00000109.FLT" with 109 runs).

Loading parameters

```


Statistics
->Memory Card
MMC Recorder
Encoder-adjust.
    
```

Select **"Memory Card"** menu
 Confirming menu selection



```

Memory Card
-> SAV_ALL OFF
-> ON
    
```

Select **"SAV_ALL"** parameter
 Confirming menu selection
 Select "SAV_ALL=EIN"



Confirm with the  key.

```

Copy1:
-----
    
```

The parameter list, the printer list and the error list are saved.



```

Memory Card
-> SAV_ALL Off
SAV_PAR Off
    
```

After the data backup the "SAV_ALL" parameter reassumes the value "OFF".

16.5.5 Performing measurements

It is possible to perform measurements on the ZETADYN 4. These measurements are configured in the **MMC-Recorder** menu and can be saved on the memory card. A description of the individual parameters of the **MMC-Recorder** menu can be found in the chapter "Parameter List / Menü MMC-Recorder". The following folder structure is created on the memory card: **"4CX\DEVICE\serial number\Rec"**. A sub-folder is created in the "Rec" folder for every measuring variant. The measurements are saved in these sub-folders. The following sub-folders can be created:

- **"ERR"**folder: Save measurements which were interrupted by occurrence of an error.
- **"NORM"**folder: Save measurements for runs without errors.
- **"SHOT"**folder: Save measurements which were made with the "Stop&Shot" function.

The actual number of runs is used as a file name (e.g. "00000109.ZR3" for 109 runs).

16.5.6 Saving configurations

The configurations of parameters can be saved on the memory card by allocating configuration numbers. The parameter list and the printer list are saved. The following folder structure is created on the memory card: **"4CX\CONFIG\configuration number"**. Parameter lists are saved with the file extension ".PA4" and printer lists with the file extension ".PRT".



Information

If two configurations are saved under the same configuration number, the existing configuration is overwritten.

Saving configurations

```
Statistics  
->Memory Card  
MMC Recorder  
Encoder-adjust.
```

Select **"Memory Card"** menu
☑ Confirming menu selection



```
Memory Card  
↳ SAV_CFG 0  
  ↳ 1
```

Select **"SAV_CFG"** parameter
☑ Confirming menu selection
Line 3: Enter configuration number ("1" in this example)



```
Copy1:  
-----
```

Confirm with the ☑ key.

The parameter list and the printer list are saved.



```
Memory Card  
UPDATE 0  
-> SAV_CFG 0  
LOD_CFG 0
```

After the data backup the **"Memory Card"** menu is displayed again.

16.5.7 Loading configurations

Saved configurations of parameters can be loaded from the memory card into the ZETADYN 4 by entering the respective configuration number. The parameters list saved in the "CONFIG" folder is loaded into the ZETADYN 4 for this.

Loading configurations

```
Statistics  
->Memory Card  
MMC Recorder  
Encoder-adjust.
```

Select **"Memory Card"** menu
☑ Confirming menu selection



```
Memory Card  
↳ LOD_CFG 0  
  ↳ 1
```

Select **"SAV_CFG"** parameter
☑ Confirming menu selection
Line 3: Enter configuration number ("1" in this example)



```
Please wait ...  
-----
```

Confirm with the ☑ key.

The parameter list and the printer list are loaded.
The frequency inverter performs a reset after loading.

16.6 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. Therefore the current in the phases U/V/W will be measured before the brakes are opening.

The monitoring function extends the start-up procedure by approx. 300 ms. In the case of the factory setting "Single" and the correct test result, this only happens during initial travel once the frequency inverter has been switched on.

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 | The motor phases are checked during initial travel once the frequency inverter has been switched on. If the check is successful, no further monitoring is performed. If the examination is incorrect, with each start an examination is made until a correct examination could be accomplished. |
| Cont | Motor phases will be checked with each travel |
| Off | Checking of the motor phases is deactivated |

The testing voltage can be selected in the menu **ZA-Intern/UVW_PEK**. 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 and 10 V. In case of an error the testing voltage is displayed in the error message. |
| 15V | Test voltage 15 V. |

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 correctly, maybe the testing voltage is too small. The testing voltage has to be increased manually.

16.7 Field weakening



The operation with field weakening is only possible with asynchronous motor.

If the required motor speed for an asynchronous motor n^* is above the rated speed n of the motor, the ZETADYN 4C automatically switches over to operation in the field weakening range.

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.

16.8 Open loop operation (operation without encoder)



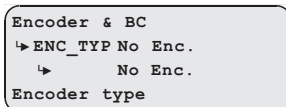
Information

Restrictions during 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 comfort than with Closed-Loop-operation
- maximum travel speed: 1,0 m/s

16.8.1 Activate operating mode for open loop operation

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".

16.8.2 Parameters for open loop operation

For open loop operation, additional parameters for optimising travel performance are available in the **Control** menu.

The parameters are visible only when open loop operation is active.

If it is necessary to change parameters, the parameter **Controller/UF_ED=manually** must be entered.

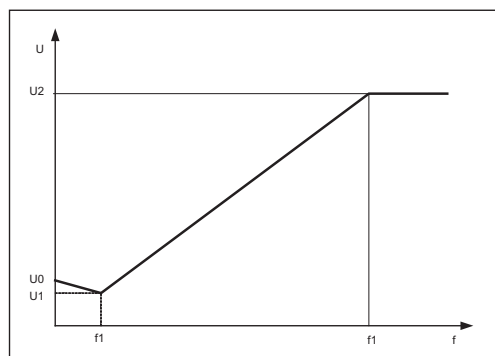
| Parameter | Description | Value range | Factory setting |
|---------------|---|---------------|-------------------------|
| C_MOD | Controller Mode Selecting the operating mode of the ZETADYN 4 FOC : Operation with encoder (Closed-Loop) U/f : Operation without encoder (Open Loop) | FOC U/f | FOC |
| 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 ... 90 A | autom. preconfiguration |
| U0 | Voltage at speed 0 of the frequency 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 |

| Parameter | Description | Value range | Factory setting |
|---------------|---|---------------|----------------------------------|
| s_LIM | Maximum slip frequency compensation | | autom. pre-configuration |
| U_S_MX | Maximum output voltage for the slip compensation | 0 ... 300 V | 80 |
| I_IxR | Current controller, sets the minimum current with which 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. pre-configuration |
| IxR_KP | P-contribution of the controller for the current | 0 ... 10 V/A | autom. pre-configuration |
| 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. pre-configuration |
| 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. pre-configuration |

16.8.3 Functions with Open-Loop-operation

16.8.3.1 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

16.8.3.2 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:

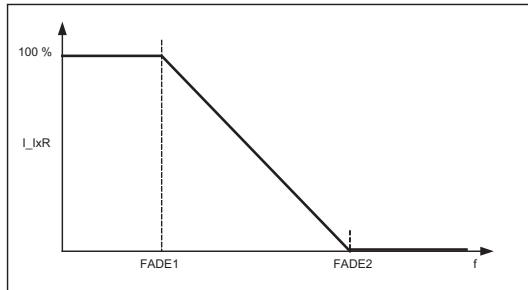
If the frequency of the rotating field in the stator is less than FADE1 the motor will be energised with 100% of I_IxR.

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

16.8.3.3 Slip-compensation

With asynchronous motors the slip (difference between synchronous speed and asynchronous speed) is proportional to the load of the motor and therefore proportional 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**.

```
Control
↳ s_COMP On
↳      On
U/f: Slip compensation
```

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 to the output voltage of the U/f-characteristic curve

The additional values of the slip-compensation will be limited by following parameters:

```
Control
↳ s_LIM 5 Hz
↳      5
U/f: Slip limitation
```

Frequency: parameter "s_LIM"

```
Control
↳ U_S_MX 80 V
↳      80
U/f: Maximum output volt.
```

Voltage: parameter "U_S_MX"

The slip-compensation depends on the parameter "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.

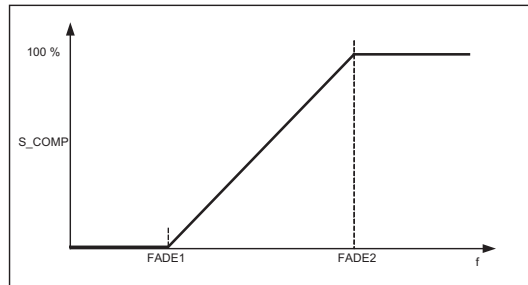
f > FADE2:

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

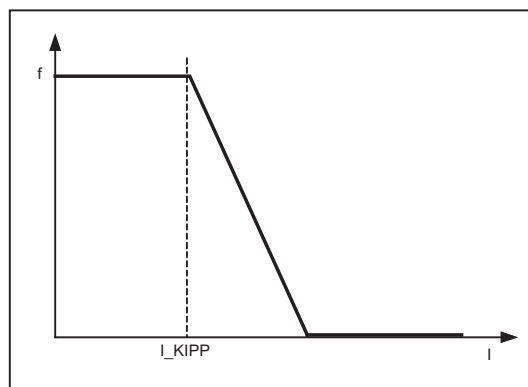
16.8.3.4 Tilting protection

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

16.8.4 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".

16.8.4.1 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.

```
Control
↳ I_IxR 15      A
  ↳      18
```

16.8.4.2 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**.

```
Control
↳ s_COMP On
  ↳      On
U/F: Slip compensation
```

16.9 Operation with a 3-phase 230 VAC power supply

Der ZETADYN 4 ZETADYN 4C can be operated with a voltage supply 3~ 230 VAC.

For this purpose, it is only necessary to adapt various monitoring functions to the lower power supply.

```
Power component
↳ UDC_N 325      V
  ↳      325
Nominal DC voltage
```

In the menu "**Power section**" configure the parameter "**UDC_N=325 V**"



```
Power component
↳ UDC_MIN 250    V
  ↳      250
Min. DC voltage
```

In the menu "**Power section**" configure the parameter "**UDC_MIN=250 V**"



```
Power component
↳ UDC_MAX 760    V
  ↳      760
Max. DC voltage
```

In the menu "**Power section**" configure the parameter "**UDC_MAX=760 V**"



```
Power component
↳ U_BC 650      V
  ↳      650
BC intervention voltage
```

In the menu "**Power section**" configure the parameter "**U_BC=650 V**"

16.10 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 avoid this, the cabin should also be braked controlled in emergency stop.

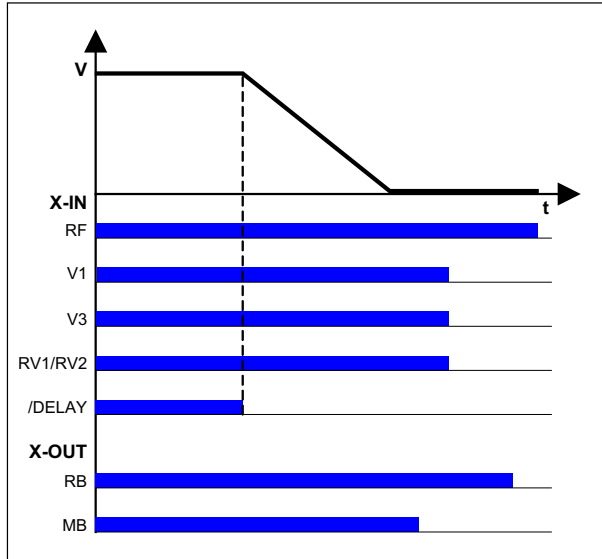
The **/DELAY** input function is available for this.

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

16.11 Travel direction counter

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.

16.11.1 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 If the start value of the down counter is set to 0.00, the down counter is deactivated. | 0.00 ... 10.00 M | 0.00 |
| TD_RST | Restore the counter reading from the absolute value encoder | On Off | Off |

The current counter readings and the start value of the travel direction change counter are also available in the **INFO** menu on **page 20**.

16.11.2 Configuring the travel direction change counter

For using the travel direction counter, the following parameters have to be adjusted.

```
Statistics
↳ TD_PWN 0
  ↳ 0
*New password
```

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.

```
Statistics
TD_PWN 0
->TD_PWC 21689
*Encrypted password
```

The coded password is shown with the parameter **"TD_PWC"** in the menu **"Statistic"**. With the coded password the ZIEHL-ABEGG SE can decode the original password. For example if the owner has forgotten it.

```
Statistics
↳ TD_PW 0
  ↳ 0
*Password entry
```

Before you can change **TD_CNT** you have to enter the password to the parameter **"TD_PW"** in the menu **"Statistic"**.

```
Statistics
↳ TD_CNT 0 M
  ↳ 0
*Down counter start value
```

Enter the maximum allowed travel directions with the parameter **"TD_CNT"** in the menu **"Statistic"**.

CAUTION!

Caution!
When replacing the ZETADYN 4C the actual value of the down counter "TD_CNT" must be transferred to the new ZETADYN 4C !

16.11.3 Configuring a preallocated travel direction change counter

The functions of a preallocated travel direction change counter are password-protected. You can detect this in the parameter **TD_PWC**, where **"16481"** is displayed as an encrypted password.

```
Statistics
TD_PWN 0
->TD_PWC 16481
```

In order to access the travel direction change counter, you must access the **"Statistics"** menu and enter the password **"1234"** for the parameter **"TD_PW"**.

```
Statistics
↳ TD_PW 0
  ↳ 1234
```

Enter password.

16.11.4 Output functions

Two special counterfunctions can be assigned to the digital outputs of the ZETADYN 4C 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 |

16.11.5 Resetting the travel direction counter



Information

At the end of maximum change of direction ZETADYN 4C 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 frequency inverter, the ZETADYN 4C 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:

```
Statistics
↳ TD_PW 0
  ↳ 0
*Password entry
```

Enter the current password in the menu "**Statistics**", "Parameter" "**TD_PW**" to be able reset the value of the down counter.

```
Statistics
↳ TD_CNT 0 M
  ↳ 0
*Down counter start value
```

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.

16.11.6 Restore the counter reading from the absolute value encoder

The counting value of the travel direction change counter is automatically saved in the absolute value encoder. This is performed at the following intervals:

- up to 1,000 direction changes, performed every 100 direction changes
- up to 10,000 direction changes, performed every 1,000 direction changes
- above 10,000 direction changes, performed every 3,000 direction changes

The function is possible in absolute value encoders with EnDat, Codeface and Hiperface interfaces.

The current counter reading can be loaded into the ZETADYN from the absolute value encoder:

```
Statistics
↳ TD_PW 0
  ↳ 0
*Password entry
```

In the "**Statistics**" menu, enter the current password for the parameter "**TD_PW**".

```
Statistics
↳ TD_RST OFF
  ↳ ON
*Restore counter reading
```

In the "**Statistics**" menu, set the parameter "**TD_RST**" to "ON".

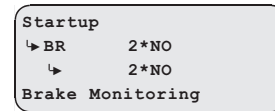
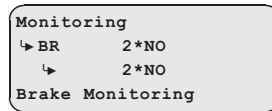
The counter reading is restored and can be viewed in the parameter TD_CNT in the **Info** menu on page 20.

16.12 Self-monitoring of the brakes according to EN81-A3

The operating brakes can be used as brake elements for protection against unintentional movement of the car. The micro-switches on the brakes are used for the required self-monitoring. Monitoring can take place both with normally closed contacts (NC) and normally open contacts (NO). The type of monitoring contact can be selected in the input programming.

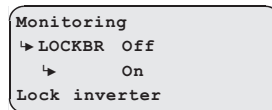
16.12.1 Activation of the self-monitoring

The self-monitoring is activated by selecting the brake circuits count and the function of the micro-switch based on the "BR" parameter in the "Startup" or "Monitors" menu (e.g. 2 brake circuits with normally open function of the microswitches: BR=2xNO).



16.12.2 Activation of the ZETADYN lock in case of a malfunctioning brake circuit

The lock function of the ZETADYN is engaged by activating the "LOCKBR=On" parameter in the "Monitors" menu.



Activation of the parameter ensures that the ZETADYN locks on detection of a faulty brake circuit. The ZETADYN lock can only be released by setting the "Monitors / UNLOCK = On" parameter.

16.12.3 Function test of the self-monitoring

Function test according to EN81-1:1998+A3:2009

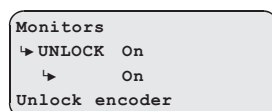
The self-monitoring test required according to EN81-1:1998+A3:2009 Enclosure F8.3.2 is performed for every software version during internal software tests at Ziehl-Abegg. For this, 10 test runs are made and the function of the self-monitoring checked.

Function test in start-up

If the drive unit brakes are used as brake elements for protection against unintended movement of the car, a function test of the self-monitoring must be made during start-up.

Test step 1

1. Disconnect signal cable at a monitor input.
2. Perform test run.
3. The error message "380 BR:Start Error" (monitor function "NCC") or "582 BR:T2 too small" (monitor function "NOC") must be output already at the start, otherwise the monitor is faulty.
4. The ZETADYN locks, no further travel is possible.
5. Re-connect the signal cable.
6. Repeat the test run to check the lock. A new run may not be possible, the ZETADYN is still locked.
7. Release the lock by setting the "Monitoring / UNLOCK = On" parameter (see display).
8. Start new run, this must take place without errors.



Repeat test step 1 for every monitor input.

Test step 2

1. Disconnect the signal cable at a monitor input and short circuit the monitor input with the internal 24V DC voltage source of the ZETADYN.
2. Perform test run.
3. The error message "380 BR:Start Error" (monitor function "NOC") or "582 BR:T2 too small" (monitor function "NCC") must be output already at the start, otherwise the monitor is faulty.
4. The ZETADYN locks, no further travel is possible.
5. Remove short-circuit and re-connect the signal cable.
6. Repeat the test run to check the lock. A new run may not be possible, the ZETADYN is still locked.
7. Release the lock by setting the "Monitoring / UNLOCK = On" parameter (see display).
8. Start new run, this must take place without errors.

```
Monitors
↳ UNLOCK On
  ↳ On
Unlock encoder
```

Repeat test step 2 for every monitor input.

16.13 Autotune function

With asynchronous motors the motor data are often unavailable or the data specified on the name plate are not correct. The optimum operating data for the motor can be determined with the Autotune function.



Information

Make sure that the cabin is empty whilst performing a measurement with the Autotune function, otherwise the measuring result will be incorrect.

Determining the operating data with the Autotune function

```
Travel
↳ V_3 0.95 m/s
  ↳ 0.95 m/s
High travel speed
```

Standard or DCP actuation:

When you use the standard or the DCP activation, reduce V_3 to 75% of V* in the **Travel** menu.

CAN actuation:

If you use CAN activation, reduce the travel speed manually to 75% with the control.



```
Mot-----04
|||-----+0 %
real: 0rpm 0V
prog: 0rpm +0.0A
```

Move down with empty cabin. Check in the **INFO menu/page 04** whether motor voltage is < 320 V.

If the motor voltage is > 320 V, reduce V_3 further in the **Travel** menu. Repeat the steps until the motor voltage is < 320 V.



```
LCD & password
->Motor name plate
Encoder & BC
System data
```

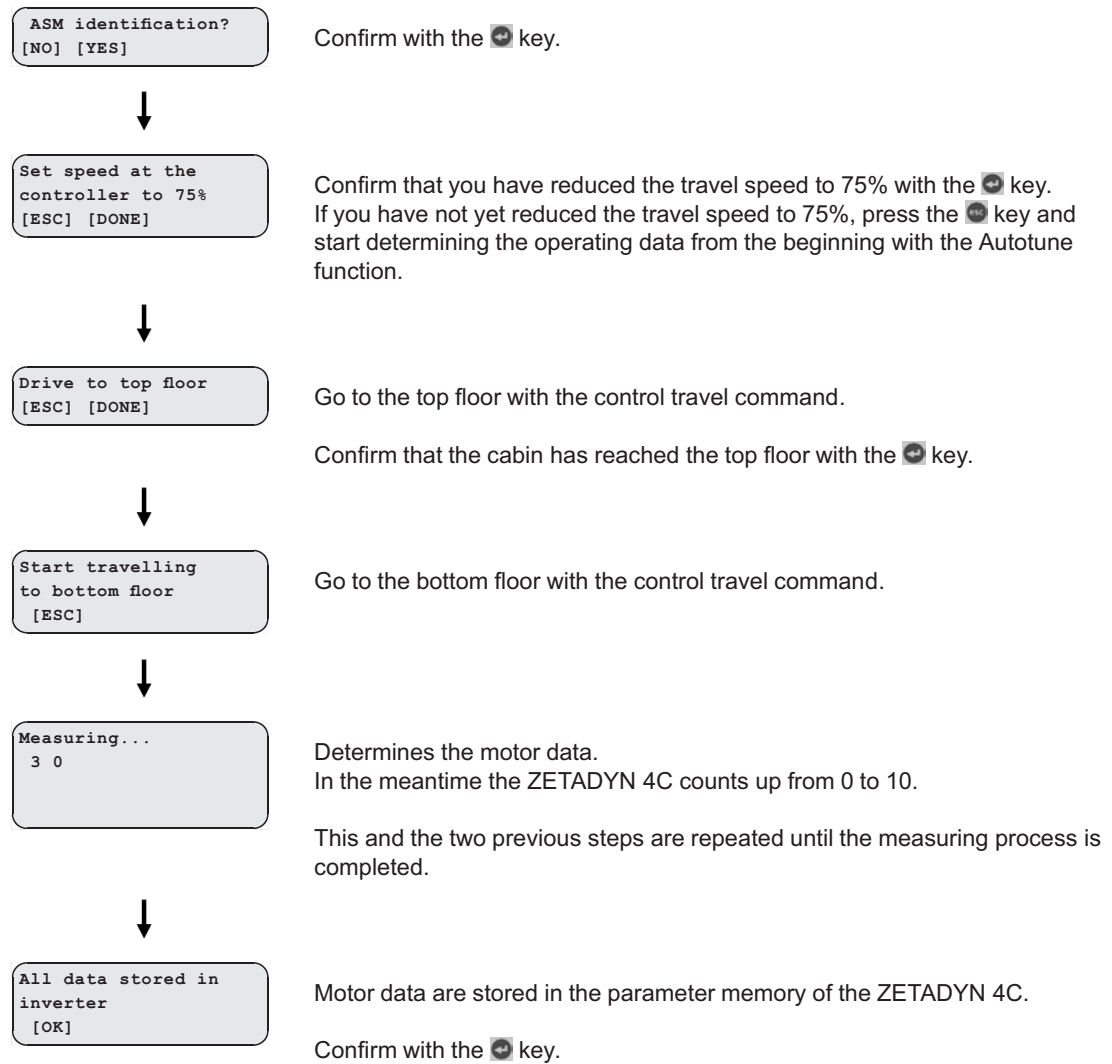
Select menu **"Motor name plate"**



```
Motor name plate
↳ ASM_ID OFF
  ↳
```

Select parameter **"ASM_ID"**
 Enter "ASM_ID=On"





16.14 Support with acceptance test

16.14.1 Rotary encoder test

The function uses software to simulate rotary encoder failure.

Performing rotary encoder test

```
Power section
-> Checks
ZA-Intern
```

Select **"Checks"** menu



```
Checks
↳ SCY_EN OFF
  ↳ ON
Enable tests
```

Select parameter **"SCY_EN"**
 Enter "SCY_EN=On"



```
Checks
↳ SCY_ENC OFF
  ↳ ON
Encoder test
```

Select parameter **"SCY_ENC"**
 Switch on rotary encoder test with "SCY_ENC=ON"

Then send a travel signal. The travel is aborted with an error message because the rotary encoder is deactivated. The SCY_EN parameter is then switched automatically to "OFF".



Information

The test function can also be activated during travel.

16.14.2 Motor temperature test

The function simulates failure of the motor temperature module or overtemperature on the motor by software.

Perform motor temperature test

```
Power section
-> Checks
ZA-Intern
```

Select **"Checks"** menu



```
Checks
↳ SCY_EN OFF
  ↳ ON
Enable tests
```

Select parameter **"SCY_EN"**
 Enter "SCY_EN=On"



```
Checks
↳ SCY_TMP OFF
  ↳ ON
Engine temp. monitor
```

Select parameter **"SCY_TMP"**
 Switch on motor temperature test with "SCY_TMP=ON"

After completing the motor temperature test, the "MOT:Temp. -Alarm" error (error 575) is output when starting up. You must switch the ZETADYN 4 off and back on to reset the error. After switching back on, the SCY_TMP parameter is set to "OFF" automatically.



Information

The test function can also be activated during travel.

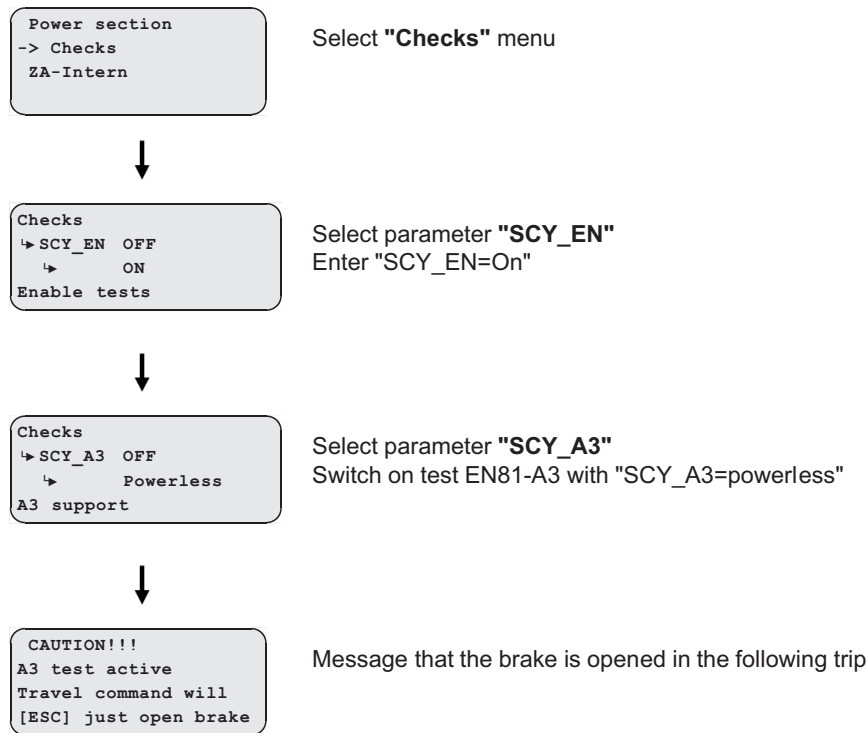
16.14.3 Testing of the protection device according to EN81-A3

Testing of the protection device according to EN81-A3 to prevent accidental movement of the cabin from the stopping point.

16.14.3.1 Powerless drifting of the cabin from the floor

The output stage is switched off, the motor brake open, the cabin drifts away.

Perform testing of protection device according to EN81-A3 with powerless drifting



Danger!

- The motor is not powered and drifts in the direction of the pulling load!
- The monitor functions of the ZETADYN are deactivated. There is a risk for the system and persons due to uncontrolled movement of the lift.

16.14.3.2 Travel with maximum acceleration from floor

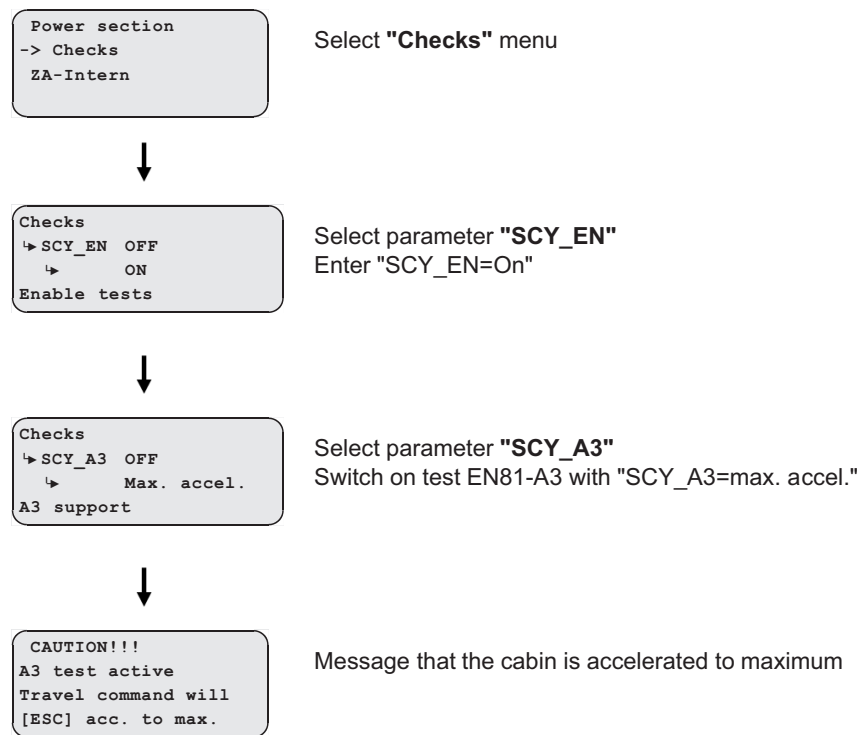
The output stage is switched on, the brakes are open, the cabin is accelerated to maximum under full power.

CAUTION!

Caution !

- Do not perform testing of the protection device according to EN81-A3 "Travel with maximum acceleration from floor" if the motor already has high temperature because the motor will be heated up even more by the maximum acceleration.
- The motor can be demagnetised by the testing of the protection device according to EN81-A3 "Travel with maximum acceleration from floor". Ziehl-Abegg will give no guarantee for motors which are do not originate from Ziehl-Abegg.

Perform testing of protection device according to EN81-A3 with maximum acceleration



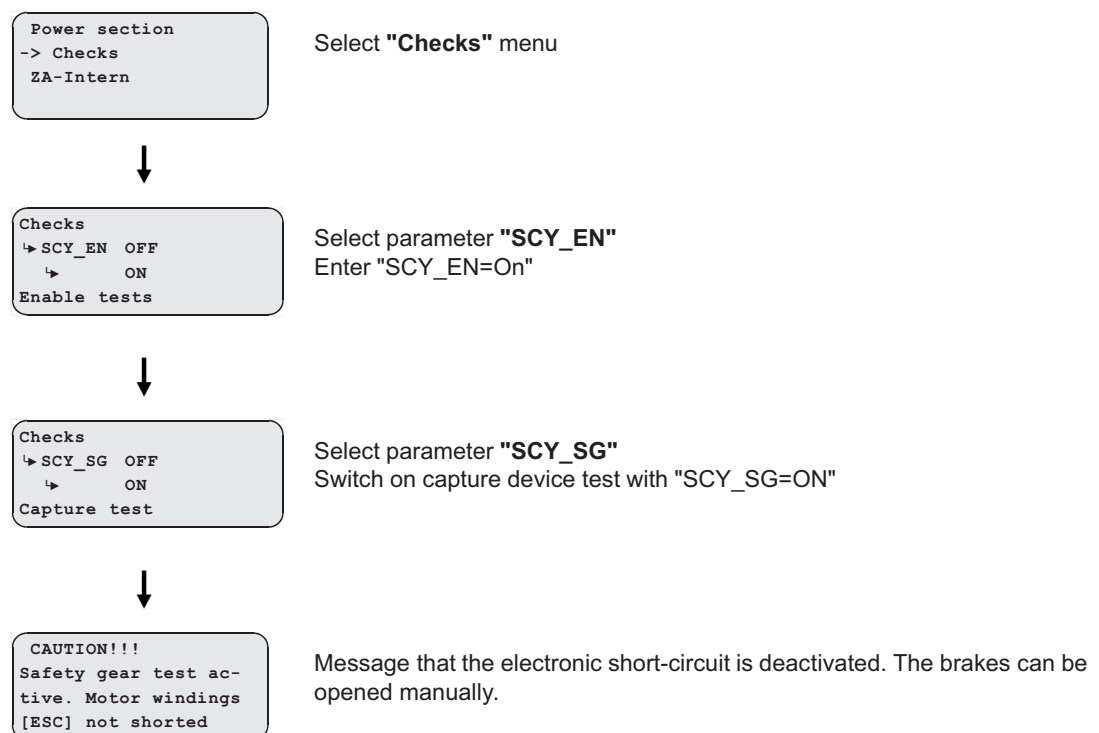
Danger!

- The monitor functions of the ZETADYN are deactivated. The maximum acceleration of the lift poses a risk to persons and the system.

16.14.4 Capture device test

The function deactivates the electronic short-circuit. The brakes must be opened manually after switching on the function.

Perform capture device test





Danger!

The monitor functions of the ZETADYN are deactivated. There is a risk for the system and persons due to uncontrolled movement of the lift.

16.14.5 Driving ability test

The cabin is moved up with the counterweight applied. The cabin movement is shown in the display.



Information

The function is only possible in connection with CAN activation.

16 Special functions

Perform driving ability test

Move up with the recovery control until the counterweight is resting on the buffer.

```
Power section
-> Checks
ZA-Intern
```

Select **"Checks"** menu



```
Checks
↳ SCY_EN OFF
  ↳ ON
Enable tests
```

Select parameter **"SCY_EN"**
 Enter "SCY_EN=On"



```
Checks
↳ SCY_DA OFF
  ↳ ON
Driving capability
test
```

Select parameter **"SCY_DA"**
 Switch on driving ability test with "SCY_DA=ON"

Move up with recovery control until the cables slip over the traction sheave.



```
CAUTION!!!
Driving ability test
active. Cabin pos.:
[ESC] + 13 mm
```

Display cabin movement

16.14.6 Motor brakes test

The function interrupts the safety circuit during travel. The distance covered by the cabin before coming to standstill is shown in the display.



Information

The function is only possible in connection with CAN activation.

Perform motor brakes test

```
Power section
-> Checks
    ZA-Intern
```

Select **"Checks"** menu



```
Checks
↳ SCY_EN OFF
    ↳ ON
Enable tests
```

Select parameter **"SCY_EN"**
 Enter "SCY_EN=On"



```
Checks
↳ SCY_MB OFF
    ↳ ON
Engine brakes test
```

Select parameter **"SCY_MB"**
 Switch on motor brakes test with "SCY_MB=ON"

Give travel command up with empty cabin
 Interrupt safety chain



```
CAUTION!!!
Motor brakes test
active. Braking dist.
[ESC] 87 mm
```

Display distance up to standstill

16.15 Electronic name plate

With the "electronic name plate" function, you can file parameters from the ZETADYN 4 in an absolute value encoder or load data from an absolute value encoder into the ZETADYN 4. The function is possible in rotary encoders with EnDat, Codeface and Hiperface interfaces.

Save data

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

Select menu **Encoder adjustment**



```
Encoder-adjust.
↳ SAV_P_E OFF
    ↳ ON
Parameters on encoder
```

Select parameter **"SAV_P_E"**
 Enter "SAV_P_E=On"

Load data

In order to be able to load data from the absolute value encoder, you must have filed the data in the absolute value encoder with the ZETADYN 4 first.

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

Select menu **Encoder adjustment**



```
Encoder-adjust.  
↳ LOD_P_E OFF  
↳ 27  
Parameters from en-  
coder
```

Select parameter "**LOD_P_E**"
Enter "LOD_P_E=27" to load data

17 Enclosure

17.1 Technical data ZETADYN 4C

17.1.1 ZETADYN 4C011 - 032

| | | ZETADYN | | | | |
|---|--------------------|--|--------|--------|--------|--------|
| | | 4Cx011 | 4Cx013 | 4Cx017 | 4Cx023 | 4Cx032 |
| Electrical data | | | | | | |
| Mains connection voltage | [V] | 3~ 180 ... 440 absolut | | | | |
| Mains frequency | [Hz] | 50 / 60 (±1,5 Hz) | | | | |
| Typ. motor output (400 V) | [kW] | 4.6 | 5.5 | 7.5 | 11 | 14 |
| Duty cycle at rated current and clock frequency 8 kHz | [%] | 60 | | | | |
| Rated current for 60% duty ratio and clock frequency 8 kHz fix | [A] | 11 | 13 | 17 | 23 | 32 |
| Nominal current for 60% switch-on duration and switching frequency 12 kHz fix ¹⁾ | [A] | 9 | 11 | 15 | 20 | 27 |
| Nominal current for 60% switch-on duration and switching frequency 16 kHz fix ¹⁾ | [A] | 8 | 10 | 13 | 17 | 23 |
| Max. operating current (for max. 10 s) | [A] | 20 | 24 | 31 | 42 | 58 |
| Power loss at rated current, clock frequency 8 kHz and duty ratio of 60 % | [W] | 193 | 204 | 242 | 309 | 424 |
| Power loss at rated current, clock frequency 16 kHz and duty ratio of 60% | [W] | 298 | 326 | 373 | 475 | 612 |
| Heat dissipation standstill 4CS | [W] | 24 | 25 | 26 | 27 | 27 |
| Heat dissipation standstill 4CS | [W] | 26 | 27 | 28 | 29 | 29 |
| Heat dissipation stand-by 1 4CA | [W] | 17 | 18 | 18 | 19 | 19 |
| Heat dissipation stand-by 1 4CS | [W] | 19 | 20 | 20 | 21 | 21 |
| Heat dissipation in Standby 2 4CA | [W] | 13 | 14 | 15 | 16 | 17 |
| Heat dissipation stand-by 2 4CS | [W] | 15 | 16 | 17 | 18 | 19 |
| Switching Freq. | [kHz] | 4 ... 16 | | | | |
| Motor frequency | [Hz] | max. 200 | | | | |
| Max. terminal cross-section line/motor/brake chopper/brake resistor | [mm ²] | 16 | | | | |
| Min. line diameter (for strain relief) Brake-Chopper / Brake-Resistor | [mm] | 11 | 11 | 11 | 11 | 14 |
| Min. line diameter (for strain relief) Motor | [mm] | 11 | 11 | 11 | 11 | 14 |
| Ambient conditions | | | | | | |
| The user must ensure that the specified ambient conditions are observed. | | | | | | |
| Protection class | | IP20 | | | | |
| Ambient conditions operation | [°C] | 0 ... 55, from 40 °C power reduction by 1.66% per 1 K temperature increase | | | | |
| Relative humidity | [%] | 90 / condensation prohibited | | | | |
| Installation height | [m über NN] | bis 2000, ab 1000 m Leistungsreduzierung um 1% pro 100 m | | | | |
| Storage and shipping temperature | [°C] | -20 to +60 | | | | |
| Degree of soiling (in acc. with DIN EN 61800-5-1) | | 2 | | | | |
| Physical data | | | | | | |
| Weight ZETADYN 4C for asynchronous motors | [kg] | 11.8 | 12.6 | 13.0 | 14.1 | 16.4 |
| Weight ZETADYN 4C for synchronous motors | [kg] | 12.0 | 12.8 | 13,2 | 14.3 | 16,6 |
| Dimensions h x w x d | [mm] | 429 x 300 x 191 | | | | |

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

17.2 Adjustment card

"Motor name plate" menu

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

Encoder & BC menu

| | |
|---------|--|
| ENC_TYP | |
| ENC_INC | |
| BC_TYP | |

Installation menu

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

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

Control system menu

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

Monitoring menu

| | |
|---------|--|
| MOD_ST | |
| STO | |
| CO | |
| BR | |
| LOCKBR | |
| UNLOCK | |
| P1P2 | |
| T_ENC | |
| T_SDLY | |
| 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 | |
| V_T3 | |
| BRK_DMP | |

Acceleration menu

| | |
|--------|--|
| A_POS | |
| R_POS1 | |
| R_POS2 | |

Travelling menu

| | |
|-----|--|
| V_1 | |
| V_2 | |
| V_3 | |
| V_Z | |
| V_4 | |
| V_5 | |
| V_6 | |
| V_7 | |

Deceleration menu

| | |
|--------|--|
| A_NEG | |
| R_NEG1 | |
| R_NEG2 | |
| S_DI3 | |
| S_DI2 | |
| S_DI1 | |
| S_ABH | |

Stop menu

| | |
|------|--|
| T_4 | |
| T_5 | |
| T_5a | |
| T_5b | |
| T_6 | |

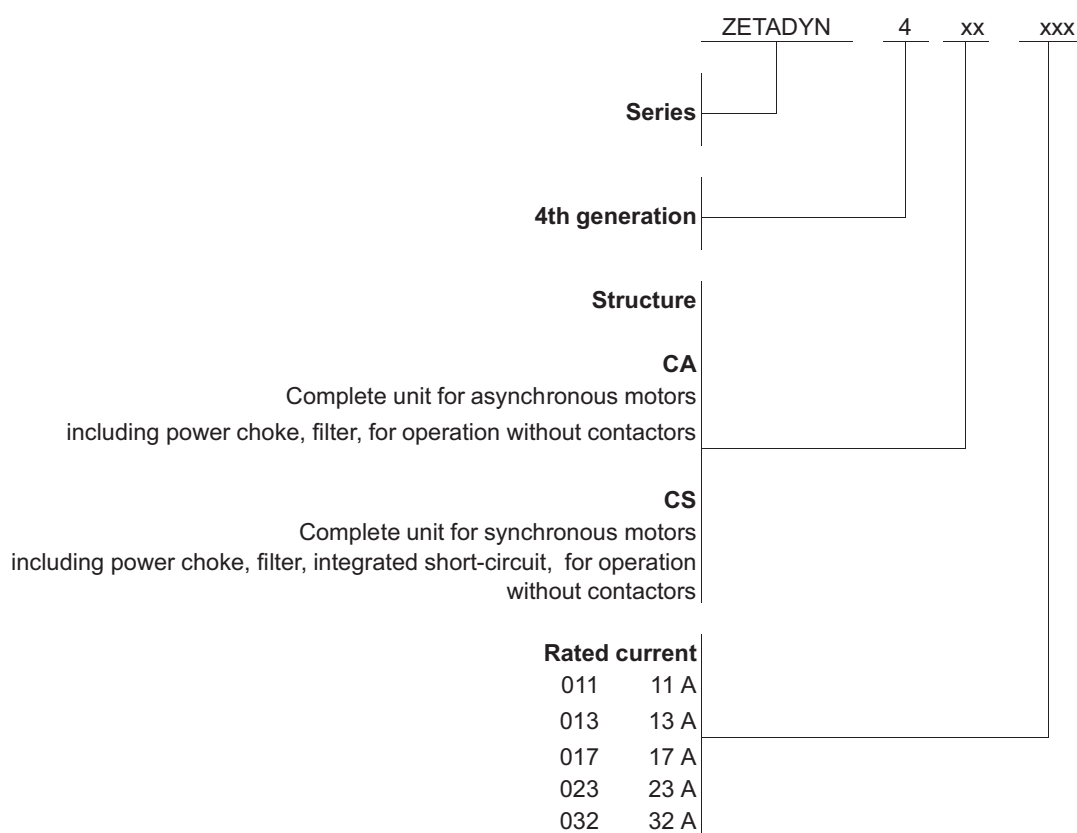
Controller menu

| | |
|--------|--|
| SPD_KP | |
| SPD_TI | |

17.3 Brake resistor allocation

| Frequency inverter | Brake resistor | Part no. |
|--------------------|----------------|----------|
| ZETADYN 4xx011 | BR11-A | 357171 |
| | BR17 | 357216 |
| ZETADYN 4xx013 | BR17 | 357216 |
| ZETADYN 4xx017 | BR17 | 357216 |
| ZETADYN 4xx023 | BR25 | 357217 |
| ZETADYN 4xx032 | BR25 | 357217 |
| | BR50 | 357218 |

17.4 Type designation



17.5 Part numbers

| A ZETADYN 4 for asynchronous motors | | S ZETADYN 4 for synchronous motors | |
|--|--------|---|--------|
| ZETADYN 4CA011 | 352194 | ZETADYN 4CS011 | 352201 |
| ZETADYN 4CA013 | 352195 | ZETADYN 4CS013 | 352202 |
| ZETADYN 4CA017 | 352196 | ZETADYN 4CS017 | 352203 |
| ZETADYN 4CA023 | 352197 | ZETADYN 4CS023 | 352204 |
| ZETADYN 4CA032 | 352198 | ZETADYN 4CS032 | 352205 |

17.6 Declaration of conformity

A-KON13_01 / Index 01 / 07.02.2013

ZIEHL-ABEGG 

EG-Konformitätserklärung

Declaration of Conformity

| | |
|------------------------------------|--|
| Firma <i>Company</i> | Ziehl-Abegg AG Heinz-Ziehl-Straße 74653 Künzelsau Germany |
| Produkte <i>Products</i> | Regelgeräte für Aufzugsantriebe ZETADYN 4C <i>Control devices for elevator machines ZETADYN 4C</i> |
| | 4CA011 4CA013 4CA017 4CA023 4CA032 4CS011 4CS013 4CS017 4CS023 4CS032 |

Diese Produkte sind entwickelt, konstruiert und gefertigt in Übereinstimmung mit der Maschinenrichtlinie 2006/42/EG und der Richtlinie für Elektromagnetische Verträglichkeit 2004/108/EG. Aufgrund der Übereinstimmung mit der Maschinenrichtlinie sind auch die Anforderungen der Niederspannungsrichtlinie 2006/95/EG erfüllt.
These products are developed, designed and manufactured in accordance with the Machinery directive 2006/42/EC and the EMC directive 2004/108/EC. Because of the accordance with the Machinery directive also the requirements of the Low Voltage directive 2006/95/EC are fulfilled.

Folgende harmonisierte Normen sind angewandt:

The following harmonized standards are in use:

| | | |
|----------|---|-------------------------|
| EN 61800 | Elektrische Leistungsantriebssysteme mit einstellbarer Drehzahl - Teil 5-1: Anforderungen an die Sicherheit <i>Adjustable speed electrical power drive systems - Part 5-1: Safety requirements</i> | EN 61800-5-1:2007 |
| EN 61800 | Elektrische Leistungsantriebssysteme mit einstellbarer Drehzahl – Teil 5-2: Anforderungen an die Sicherheit – Funktionale Sicherheit IEC 61800-5-2:2007 <i>Adjustable speed electrical power drive systems – Part 5-2: Safety requirements – Functional</i> | EN 61800-5-2:2007 |
| EN 61800 | Drehzahlveränderliche elektrische Antriebe- Teil 3: EMV-Anforderungen einschließlich spezieller Prüfverfahren <i>Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods</i> | EN 61800-3:2004 |
| EN 62061 | Sicherheit von Maschinen - Funktionale Sicherheit sicherheitsbezogener elektrischer, elektronischer und programmierbarer elektronischer Steuerungssysteme <i>Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems</i> | EN 62061:2005 / AC:2010 |

A-KON13_01 / Index 01 / 07.02.2013



| | | |
|----------|---|-------------------------------|
| EN 13849 | Sicherheit von Maschinen – Sicherheitsbezogene Teile von Steuerungen - Teil 1: Allgemeine Gestaltungssätze <i>Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design</i> | EN ISO 13849-1:2008 / AC:2009 |
| EN 13849 | Sicherheit von Maschinen - Sicherheitsbezogene Teile von Steuerungen - Teil 2: Validierung <i>Safety of machinery - Safety-related parts of control systems – Part 2: Validation</i> | EN ISO 13849-2:2012 |
| EN 12015 | Elektromagnetische Verträglichkeit – Produktfamilienorm für Aufzüge – Störaussendung <i>Electromagnetic compatibility – Product family standard for lifts – Emission</i> | EN 12015:2004 |
| EN 12016 | Elektromagnetische Verträglichkeit – Produktfamilienorm für Aufzüge – Störfestigkeit <i>Electromagnetic compatibility – Product family standard for lifts – Immunity</i> | EN 12016:2004 + A1:2008 |

Die Konformität wurde vom TÜV Rheinland mit der EG-Baumusterprüfbescheinigung 01/205/5288/13 bestätigt.

The conformity is accredited with the certificate 01/205/5288/13 by the notified body TÜV Rheinland.

Die Nummer Adresse der benannten Stelle ist:

The number address of the notified body is:

NB 0035
TÜV Rheinland Industrie Service GmbH
Alboinstr. 56
12103 Berlin
Germany

Künzelsau, den 07.02.2013

Ziehl-Abegg AG

ppa.

Ralf Arnold
Leitung Geschäftsbereich Antriebstechnik / Director Drive Division

A-KON13_02 / Index 01 / 07.02.2013



EG-Konformitätserklärung

Declaration of Conformity

| | |
|------------------------------------|--|
| Firma <i>Company</i> | Ziehl-Abegg AG Heinz-Ziehl-Straße 74653 Künzelsau Germany |
| Produkte <i>Products</i> | Regelgeräte für Aufzugsantriebe ZETADYN 4C <i>Control devices for elevator machines ZETADYN 4C</i> |
| | 4CA011 4CA013 4CA017 4CA023 4CA032 4CS011 4CS013 4CS017 4CS023 4CS032 |

Diese Produkte sind entwickelt, konstruiert und gefertigt in Übereinstimmung mit der Aufzugsrichtlinie 95/16/EG und der Richtlinie für Elektromagnetische Verträglichkeit 2004/108/EG.
These products are developed, designed and manufactured in accordance with the lift directive 95/16/EC and the EMC directive 2004/108/EC.

Folgende harmonisierte Normen sind angewandt:
The following harmonized standards are in use:

| | | |
|-----------------|--|----------------------------|
| EN 81 | Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen – Teil 1: Elektrisch betriebene Personen- und Lastenaufzüge <i>Safety rules for the construction and installation of lifts – Part 1, Electric lifts</i> | EN 81-1:1998 + A3:2009 |
| EN 81 | Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen – Teil 2: Hydraulisch betriebene Personen- und Lastenaufzüge <i>Safety rules for the construction and installation of lifts – Part 2, Hydraulic lifts</i> | EN 81-2:1998 + A3:2009 |
| EN 12015 | Elektromagnetische Verträglichkeit – Produktfamilienorm für Aufzüge – Störaussendung <i>Electromagnetic compatibility – Product family standard for lifts – Emission</i> | EN 12015:2004 |
| EN 12016 | Elektromagnetische Verträglichkeit – Produktfamilienorm für Aufzüge – Störfestigkeit <i>Electromagnetic compatibility – Product family standard for lifts – Immunity</i> | EN 12016:2004 + A1:2008 |

A-KON13_02 / Index 01 / 07.02.2013



**Die Konformität wurde vom TÜV Rheinland mit der Baumusterprüfbescheinigung
01/208/6005/13 bestätigt.**

The conformity is accredited with the certificate 01/208/6005/13 by the notified body TÜV Rheinland.

Die Nummer Adresse der benannten Stelle ist:

The number address of the notified body is:

**NB 0035
TÜV Rheinland Industrie Service GmbH
Alboinstr. 56
12103 Berlin
Germany**

Künzelsau, den 07.02.2013

Ziehl-Abegg AG

ppa.

A handwritten signature in blue ink, appearing to read 'Ralf Arnold', written over the printed name.

Ralf Arnold
Leitung Geschäftsbereich Antriebstechnik / *Director Drive Division*

17.7 Certificates



Declaration for trip direction change counter

Date of issue of original declaration : June 24, 2011
Revision number : -
Revision date : -
Requirements : Lifts Directive 95/16/EC
Project no. : P110087-01

1. General specifications

Name and address manufacturer : Ziehl-Abegg AG
Heinz-Ziehl-Strasse
74653 Künzelsau
Germany
Description of the reviewed component : Trip direction change counter
Frequency inverter type : ZETADYN
Data of examination : April 2011 - June 2011
Examination done by : A. van den Burg
Laboratory : None

17 Enclosure



2. Description of the component

We herewith declare that the trip direction change counter fulfils all requirements as stated in the certificate NL 10-400-1002-130-01 for the application of the Brugg SDR 8,1 mm coated suspension ropes for lifts.

For applications with comparable conditions the counter can also be used with other coated suspension rope types.

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

The counter is part of the Ziehl-Abegg ZETADYN frequency inverter.

It consists of two digital counters, the counter "A" (Parameter "TD_DRV") and the counter "B" (Parameter "TD_CNT"), both counters only count the number of changes in direction, successive trips in the same direction are counted as one trip only.

Counter "A" is used to collect the total number of trips, it is not possible to reset this counter also not by a reset of the frequency inverter nor by removing its power supply.

Counter "B" is used to limit the amount of allowed trips, changing of allowable maximum number of trips or resetting is protected by a password, this password can be defined for each controller separately.

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

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

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

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

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

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

A. van den Burg
Senior Specialist
Dep. Product Certification
Liftinstituut B.V.

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Rev. - date: June 24, 2011

Page 2 of 2

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L I F T I N S T I T U U T B . V . - S A F E T Y A N D Q U A L I T Y M A N A G E M E N T
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ZERTIFIKAT

CERTIFICATE

Type-Examination Certificate

Reg.-Nr./No.: 01/208/6005/13

| | | | |
|--|--|---|--|
| Prüfgegenstand Product tested | Sicherheitsfunktion STO, Sicherer Halt (Stopp Kategorie 0) Safety Function STO, Safe Stop (Stop Category 0) | Zertifikats- inhaber Certificate holder | Ziehl-Abegg AG Drive Division Heinz-Ziehl-Straße 74653 Künzelsau Germany |
| Typbezeichnung Type designation | ZETADYN 4C Drive Family: ZETADYN 4Cxyyy, x = S A (Synchronous- / Asynchronous AC-Motors), y = 011, 013, 017, 023, 032 (rated current in Amps) | Hersteller Manufacturer | wie Zertifikatsinhaber see certificate holder |
| Prüfgrundlagen Codes and standards forming the basis of testing | Directive 95/16/EC EN 81-1:1998 + A3:2009 EN 81-2:1998 + A3:2009 | EN 12015:2004 EN 12016:2004 + A1:2008 EN 61800-5-2:2007 | |
| Bestimmungsgemäße Verwendung Intended application | Sicheres Stillsetzen zur Anwendung bei Personen- und Lastenaufzügen: Ersatz der Motorschütze zur Stillsetzung des Antriebs Use at elevators, safe stop of the lift car: Replacement of contactors to stop the machine 12.7.3 a) der/of EN 81-1 or 12.4.1 a) der/of EN 81-2. | | |
| Besondere Bedingungen Specific requirements | Die Hinweise in der zugehörigen Installations- und Betriebsanleitung sind zu beachten. Siehe auch Anhang zum Zertifikat. The instructions of the associated Installation and Operating Manual shall be considered. See Annex to Certificate. | | |
| Es wird bestätigt, dass das Produkt mit den Anforderungen der Richtlinie 95/16/EG über Aufzüge übereinstimmt. It is confirmed that the product under test complies with the requirements for lifts defined in the EC Directive 95/16/EC. | | | |
| Dieses Zertifikat ist gültig bis 12.02.2018. This certificate is valid until 2018-02-12. | | | |



Der Ausstellung dieses Zertifikates liegt eine Prüfung zugrunde, deren
Ergebnisse im Bericht-Nr. 968/A 166.00/13 vom 12.02.2013 dokumentiert sind.
Der Inhaber eines für den Prüfgegenstand gültigen Genehmigungs-Ausweises
ist berechtigt, die mit dem Prüfgegenstand übereinstimmenden Erzeugnisse mit
dem abgebildeten Prüfzeichen zu versehen.
The issue of this certificate is based upon an examination, whose results are
documented in report-no.: 968/A 166.00/13 dated 2013-02-12.
The holder of a valid licence certificate for the product tested is authorized to
affix the test mark shown opposite to products, which are identical with the
product tested.

Köln, 2013-02-12



Certification Body for Lifts and their
Safety Components, NB 0035



Dipl.-Ing. Volker Sepanski

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2013-02-13



Supplemental sheet of the EC Type Examination Certificate 01/208/6005/13 dated 2013-02-12.

| | | |
|---------------------------------|---|---|
| 1. Component | Safety-Function STO (ZETADYN 4C) Safety circuit containing electronic components | |
| 2. Manufacturer | ZIEHL-ABEGG AG Heinz-Ziehl-Straße 74653 Künzelsau | |
| 3. Designation / Nomenclature | ZETADYN 4Cxyyy x = S, A (synchronous- / asynchronous motor) y = 011, 013, 017, 023, 032 (nominal current in [Amps]) | |
| 4. Intended application | Lift safe stop (Safe Torque OFF (STO)) | |
| 5. Function indication | Safety Function STO / Safe Stop (Stop-Category 0) for the ZETADYN 4C product family | |
| 6. Intended use | Electric lifts – Replacement of motor contactors for stopping the lift acc. to: 12.7.3 a) of EN 81-1 or acc. to: 12.4.1 a) of EN 81-2. | |
| 7. Characteristics | Input voltage: | typ.: 0 / 24 V DC |
| | STO_A – GND and STO_B – GND | LOW: 0 ... 3 V DC HIGH: 15 ... 30 V DC |
| | Input current: | typ.: 12 mA (HIGH) |
| | STO_A – GND and STO_B – GND | |
| | turn-off time: (time between switching off the input signal(s) and disabling the power stage) | max. 50 ms |
| | Discrepancy time t_v | Max. delay time between STO_A and STO_B: $t_v < 120$ ms |
| | Software diagnostic: (not safety relevant) | if $t_v > 120$ ms then failure indication by frequency converter |
| | Hardware diagnostic: | 310 ms $< t_v < 1600$ ms (typ. 750 ms) (when exceeded, the drive is locked out and can only be set in operation again by power cycling). |
| | Minimum demand rate of the STO function: | 1/h for min. 1600 ms each |
| | Working life: | After 20 years the device shall be replaced by a new one. |
| Protection degree of enclosure: | IP 20 The user is required to ensure pollution degree 2 acc. to EN 61800-5-1 by suitable measures or choice of the mounting location. | |
| Operating temperature: | 0 ... +55 °C (above +40 °C reduction of rated power by 1,66 % per 1 K is required) | |
| Humidity: | < 90 % rH (no condensation)) | |

2013-02-13



| | |
|---|--|
| | <p>Safety characteristics:</p> <p>SIL 3, PL e, Kat. 4 PFH = 3,11E-10 1/h MTTF_d = 410 a (High) DC_{avg} = High</p> <p>Further technical details are stated in the manual of the ZETADYN 4C by Ziehl-Abegg AG.</p> |
| 8. Maintenance | <p>The frequency converter ZETADYN 4C product family shall not be maintained by the end user. In case of failure, the device shall be replaced. The correct installation of the frequency converter and also the safety function STO needs to be checked regularly in accordance with the directives stated in the manual.</p> |
| 9. Installation | <p>The guidelines in the ZETADYN 4C manual regarding installation, commissioning and test shall be observed.</p> <ul style="list-style-type: none"> - The relevant national regulations (e.g. VDE-directions) and the requirements of the EN 81-1/-2 shall be followed. The wiring shall conform to general EMC requirements. - External short circuits and cross faults on the wiring of the STO-signals must be excluded. The user shall make sure that terminal points and wirings are fault free because the internal diagnostic of the ZETADYN 4 is not able to detect cross faults. - Supply lines (power-, motor cable) and STO-cables shall be spatially separated. - The cable length for STO signals must not exceed 50 m. |
| 10. Configuration | <ul style="list-style-type: none"> - The safety function STO is neither adjustable nor configurable. - Switching of the STO-signals shall be done by separate relays. (two channel operation). - It must be noted that the lift brakes are not operated by the STO function. Therefore the user shall ensure by appropriate electric circuits that the brakes are actuated when necessary. |
| 11. Auxiliary conditions for a safe operation | <ul style="list-style-type: none"> - By selection of an appropriate mounting location it shall be ensured that environmental influences have no adverse effect on the safety function. In particular pollution degree 2 in accordance to DIN EN 61800-5-1 shall be ensured. - For commissioning and periodical tests of the elevator the following checks are required. <ul style="list-style-type: none"> - Check for correct Installation - Check for hardware version - Test of the Safety Function. - In case of fault accumulation (defects on two or more power semiconductors), even at correct operation of the safety function STO, the motor shaft could turn for a maximum angle of $\varphi = (180^\circ / \text{number of pole pairs})$. Therefore the installation company shall ensure by risk analysis that this movement cannot cause any hazard. - A circuit breaker / fuse shall be installed in the power input of the frequency converter. Power shall be disconnected in case of failures in the power stage. - It must be noted that up to 3 minutes after mains disconnection dangerous voltage is still present on the device (capacitor discharge time). |

17 Enclosure

Sepanski

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**ZERTIFIKAT
 CERTIFICATE**

EC Type-Examination Certificate

Reg.-Nr./No.: 01/205/5288/13

| | | | |
|--|--|---|--|
| Prüfgegenstand Product tested | Sicherheitsfunktion STO Sicherer Halt (Stopp Kategorie 0) Safety Function STO, Safe Stop (Stop Category 0) | Zertifikats- inhaber Certificate holder | Ziehl-Abegg AG Drive Division Heinz-Ziehl-Straße 74653 Künzelsau Germany |
| Typbezeichnung Type designation | ZETADYN 4C Drive Family: ZETADYN 4Cxyyy, x = S, A (Synchronous- / Asynchronous AC-Motors), y = 011, 013, 017, 023, 032 (rated current in Amps) | Hersteller Manufacturer | wie Zertifikatsinhaber see certificate holder |
| Prüfgrundlagen Codes and standards forming the basis of testing | EN 61800-5-2:2007 EN 61800-5-1:2007 EN 61800-3:2004 | EN 62061:2005 + AC:2010 EN ISO 13849-1:2008 + AC:2009 EN 61508 Parts 1-7:2010 | |
| Bestimmungsgemäße Verwendung Intended application | Sicherer Halt an drehzahlveränderbare Antrieben. Die Sicherheitsfunktion STO in den ZETADYN 4C Antrieben erfüllt die Anforderungen der Prüfgrundlagen (Kat. 4 / PL e nach EN ISO 13849-1, SIL CL 3 nach EN 61800-5-2 / EN 62061 / IEC 61508) und können in Anwendungen bis Kat. 4 / PL e nach EN ISO 13849-1 und SIL 3 nach EN 62061 / IEC 61508 eingesetzt werden. Safe Stop at speed variable drives. The safety function STO within the ZETADYN 4C drives complies with the requirements of the relevant standards (Cat. 4 / PL e acc. to EN ISO 13849-1, SIL CL 3 acc. to EN 61800-5-2 / EN 62061 / IEC 61508) and can be used in applications up to Cat. 4 / PL e acc. to EN ISO 13849-1 and SIL 3 acc. to EN 62061 / IEC 61508. | | |
| Besondere Bedingungen Specific requirements | Die Hinweise in der zugehörigen Installations- und Betriebsanleitung sind zu beachten. The instructions of the associated installation and Operating Manual shall be considered. | | |
| Es wird bestätigt, dass der Prüfgegenstand mit den Anforderungen nach Anhang I der Richtlinie 2006/42/EG über Maschinen übereinstimmt. It is confirmed that the product under test complies with the requirements for machines defined in Annex I of the EC Directive 2006/42/EC. | | | |
| Dieses Zertifikat ist gültig bis 12.02.2018. This certificate is valid until 2018-02-12. | | | |

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Der Ausstellung dieses Zertifikates liegt eine Prüfung zugrunde, deren Ergebnisse im Bericht-Nr. 968/A.166.00/13 vom 12.02.2013 dokumentiert sind. Der Inhaber eines für den Prüfgegenstand gültigen Genehmigungs-Ausweises ist berechtigt, die mit dem Prüfgegenstand übereinstimmenden Erzeugnisse mit dem abgebildeten Prüfzeichen zu versehen.
The issue of this certificate is based upon an examination, whose results are documented in report-no.: 968/A.166.00/13 dated 2013-02-12.
The holder of a valid licence certificate for the product tested is authorized to affix the test mark shown opposite to products, which are identical with the product tested.



E. Frejro
 -Ing. Eberhard Frejro

Berlin, 2013-02-12

Certification Body for Machinery, NB 0035

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17.8 Index

| | | | | | |
|---------------------------------------|--------|---|------------|--|--------|
| A | | E | | Minimum distances | 15 |
| Acceleration menu | 85 | Electronic name plate | 186 | MMC recorder | 90 |
| Activating the DCP interface | 65 | EMC-compatible installation | 16 | MMC-Recorder menu | 90 |
| activation of the CAN inter- face | 67 | Emergency evacuation by opening the brakes | 127 | Monitoring menu | 82 |
| Application | 12 | Encoder & BC menu | 74 | Monitoring of the motor con- tactors (X-CO) | 42 |
| Arch travel | 109 | Encoder adjustment menu | 92 | Motor connection | 25 |
| Automatic parameter check | 147 | Error list | 88, 131 | Motor contactors | 40, 42 |
| Automatic parameter diag- nostics | 147 | errors | 66 | Motor name plate menu | 74 |
| away | 59 | Evacuation through UPS with minimum power | 122 | Motor temperature monitor- ing | 27 |
| B | | Evacuation through UPS with optimum power | 122 | N | |
| baud rate | 66, 69 | Evacuation with 1-phase mains supply 230V AC | 120 | Node number | 69 |
| Block function | 132 | Evacuation with UPS | 121 | nominal travel speed | 69 |
| Brake release monitoring | 43 | Exclusion of liability | 9 | Normal stop | 108 |
| Brake resistor | 27 | External 24V power supply | 40 | Normal travel | 104 |
| Brake-Chopper connection | 29 | F | | Number of mains interrup- tions | 88 |
| Brake-Resistor connection | 28 | Fast-start | 118 | Number of trips | 88 |
| Brakes | 43 | Functional description | 12 | O | |
| bus-cable | 34, 66 | fuse | 23 | Open loop operation | 171 |
| C | | H | | Operating hours | 88 |
| CAN menu | 94 | hazards | 11 | operating language | 70, 73 |
| CANopen lift | 66 | HW-Ident. menu | 93 | Operating mode | 69 |
| centrifugal masses | 12 | I | | Operating modes | 145 |
| Clock frequency | 152 | INFO menu | 95 | Operating terminal ZETAPAD | 46 |
| Commissioning | 11, 52 | installation | 13, 34, 66 | operating-curves default | 56 |
| Connection suggestion ZE- TADYN 4C | 45 | Installation menu | 76 | operation and configuration | 49 |
| contactor monitoring | 42 | Interrupt points | 57 | operation in idle | 117 |
| Control system menu | 77 | interventions | 11 | operation without encoder | 171 |
| Control transformer | 25 | L | | Optimizing start up behavior | 105 |
| Controller menu | 87 | LCD & Password menu | 73 | Optimizing stopping | 115 |
| Controller Mode | 171 | LED | 129 | Optimizing the acceleration | 107 |
| Copyright | 10 | lift number | 69 | Optimizing the step align- ment | 115 |
| Crawl path optimization | 113 | Line reactor-radio interfer- ence filter | 24 | P | |
| D | | Load-free alignment EnDat- Encoder | 156 | Parameter | 70, 73 |
| DCP / CAN interface | 33 | Load-free alignment SSI-En- coder | 153 | Parameter set 2 menu | 88 |
| DCP protocols | 64 | M | | parameters | 69 |
| DCP-leveling behavior | 66 | Mains connection | 23 | Pictographs | 10 |
| DCP-mode | 64 | maintenance | 13 | position mode | 101 |
| Decelerating menu | 86 | Masc-Funktion | 131 | power feedback unit | 149 |
| Delete error memory | 131 | Memory card | 164 | Power section menu | 93 |
| Digital inputs | 29 | Memory Card menu | 89 | Product safety | 11 |
| Digital outputs | 32 | Menu and parameter navi- gation | 50 | Protective ground connection | 23 |
| Dimensions | 15 | Menu checks | 93 | R | |
| Direct leveling | 116 | Menu navigation | 49 | Readjustment | 117 |
| Disposal | 13 | N | | Readout the error memory | 130 |
| Distance-dependent deceler- ation | 108 | Minimum distances | 15 | Recorder | 90 |
| down counter | 177 | MMC recorder | 90 | recycling | 13 |
| due diligence | 11 | MMC-Recorder menu | 90 | Reset | 163 |
| E | | Monitoring menu | 82 | Residual current operated device (RCCB) | 24 |
| F | | Monitoring of the motor con- tactors (X-CO) | 42 | | |
| G | | Motor connection | 25 | | |
| H | | Motor contactors | 40, 42 | | |
| I | | Motor name plate menu | 74 | | |
| J | | Motor temperature monitor- ing | 27 | | |
| K | | | | | |
| L | | | | | |
| M | | | | | |
| N | | | | | |
| O | | | | | |
| P | | | | | |
| Q | | | | | |
| R | | | | | |
| S | | | | | |
| T | | | | | |
| U | | | | | |
| V | | | | | |
| W | | | | | |
| X | | | | | |
| Y | | | | | |
| Z | | | | | |

| | |
|--|--------|
| Rotary encoder calibration | 152 |
| Rotary encoder connection for asynchronous motors | 36, 38 |
| Rotary encoder resolution | 74 |
| Rotary encoder simulation | 39 |
| Rotary encoder type | 74 |

S

| | |
|-----------------------|-------------|
| Safety Brake | 161 |
| Safety gear menu | 92 |
| Safety instructions | 10 |
| save energy | 148 |
| Self-monitoring | 179 |
| Service | 13 |
| Software update | 164 |
| Standby 1: | 148 |
| Standby 2: | 148 |
| Start menu | 84 |
| Start-up | 70, 104-105 |
| Statistic menu | 88 |
| STO interface (X-STO) | 35 |
| Stop | 115 |
| Stop menu | 86 |
| Symbols description | 10 |

T

| | |
|-----------------------------|--------|
| Target group | 9 |
| Technical data ZETADYN 4C | 188 |
| Terminal positions | 21 |
| terminating resistor | 34, 66 |
| Time-dependent deceleration | 110 |
| Transmission rate | 69 |
| Transport | 13 |
| Travel abort | 128 |
| travel aborts | 89 |
| travel direction counter | 176 |
| Travel menu | 85 |
| Traveling speed | 108 |
| Type designation | 7, 190 |

V

| | |
|---------------------------|-----|
| velocity mode | 101 |
| voltage supply 3~ 230 VAC | 175 |

Z

| | |
|--------------------|-----|
| ZA-Intern menu | 94 |
| ZETADYN 4 | 148 |
| ZETAPAD | 46 |
| ZETAPAD dimensions | 47 |

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