Bewegung durch Perfektion | Movement by Perfection

ZIEHL-ABEGG

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

ZA dynpro

Frequency inverter

Original operating instructions

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Part 2

-Parameter
-Diagnosis
-Special functions

R-TBA17_03-GB 2023/18 Index 008 Part.-No. 00163461-GB

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Content

1 Serial communication

1.1 DCP (Drive Control & Position) (only for ZAdynpro xxx DCP)

The DCP mode enables series control of the ZAdynpro via an RS485 interface. The two-directional series control conveys the control signals via a 2 or 3-wire connection cable. In general, the cables X-IN and X-OUT are no longer required, which reduces the wiring outlay significantly.

1.1.1 Electrical connection

Connection is via the X-CAN interface on the ZAdynpro (see “Electrical installation/CAN/DCP interface (X-CAN)” chapter).

1.1.2 The various DCP protocols

DCP_01

The functional principle is identical to conventional actuation using the control inputs (X-IN) and control outputs (X-OUT1, X-OUT2). The elevator control system transmits the required control signals (e.g. controller enable, direction of travel, speed, deceleration point) to the ZAdynpro and receives the status messages as status bits as return information from the ZAdynpro (e.g. signals for mechanical brakes, motor contactors, STO function, speed monitoring and group fault).

DCP_03

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

- faster data transmission
- a faster communication channel
- Automatic compatibility checking between the software in the ZAdynpro and the software in the control system

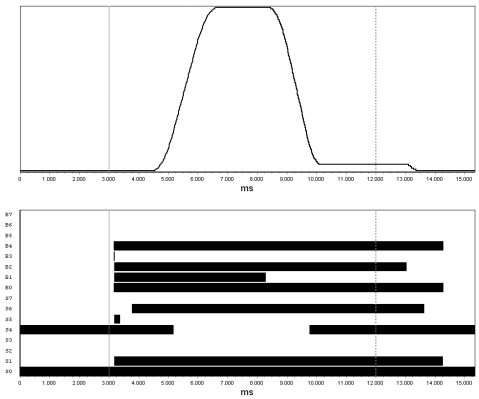
DCP_02

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 ZAdynpro start command to specify the path to the next level. This path is continuously updated during travel (remaining distance). The ZAdynpro 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.

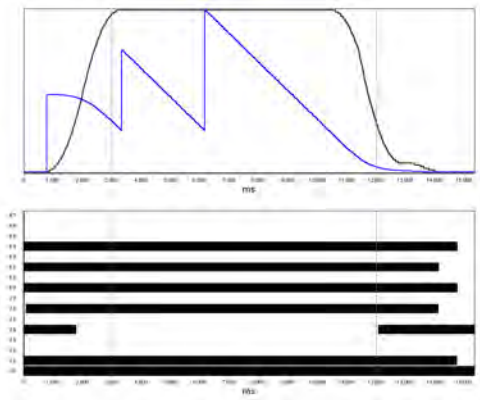
DCP_04

The DCP_04 protocol is an expanded version of the DCP_02 protocol. Compared to the DCP_02 protocol, it has:

- faster data transmission
- a faster communication channel
- Automatic compatibility checking between the software in the ZAdynpro and the software in the control system
- 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		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
```

1.1.3 Configuring in DCP mode

1.1.3.1 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	Abbreviation ZAdynpro
BÖHNKE + PARTNER	DCP1	04:BP_DCP1
BÖHNKE + PARTNER	DCP2	05:BP_DCP2
BÖHNKE + PARTNER	DCP3	06:BP_DCP3
BÖHNKE + PARTNER	DCP4	07:BP_DCP4
Hydraulic configuration	DCP4	36:HY-Mod.
Kollmorgen	DCP3	09:KN_DCP3
Kollmorgen	DCP4	10:KN_DCP4
NEW LIFT	DCP3	12:NL_DCP3
NEW LIFT	DCP4	37:NL_DCP4
Osma elevators	DCP3	34:OS_DCP3
SCHNEIDER STEUERUNGSTECHNIK	DCP3	14:SS_DCP3
SCHNEIDER STEUERUNGSTECHNIK	DCP4	33:SS_DCP4
STRACK LIFT AUTOMATION	DCP3	22:ST_DCP3
STRACK LIFT AUTOMATION	DCP4	23:ST_DCP4
Weber Lifttechnik	DCP1	17:WL_DCP1

Weber Lifttechnik	DCP2	18:WL_DCP2
Weber Lifttechnik	DCP3	19:WL_DCP3
Weber Lifttechnik	DCP4	20:WL_DCP4
KW AUFZUGSTECHNIK	DCP3	26:KW_DCP3

1.2 CANopenLift

1.2.1 Start-up the CAN-interface

1.2.1.1 ZAdynpro

- Only devices with the CiA 417 profile are allowed.
- All devices work in 11 bit - mode.
- There can only be one ZAdynpro connected per bus system.

☞ For information on the electrical installation of CANopen lift, please refer to chapter "Electrical installation/CAN interface (X-CAN)" in part 1. of the operating instructions.

1.2.1.2 Activating the interface

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

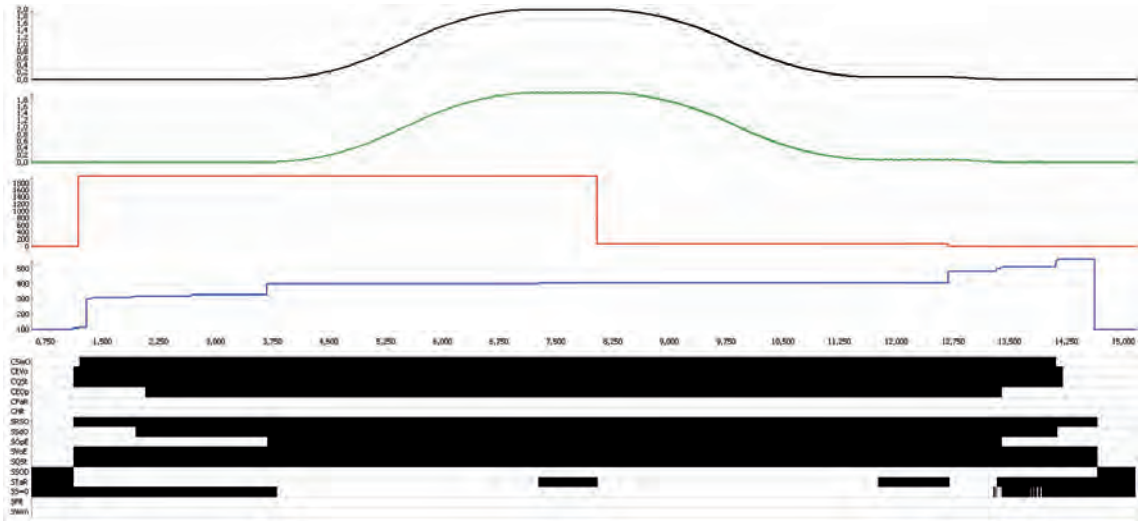
```
Control
↳CONFIG  01:ZA_IO
  ↳      02:ZA_CAN
Configuration
```

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

1.2.1.3 Operation modes

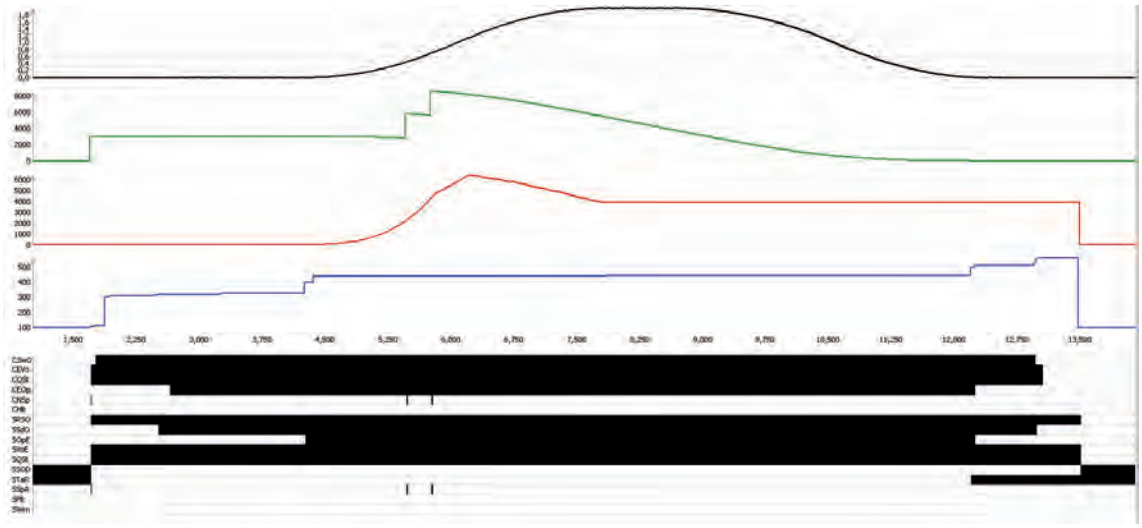
Information
There are two operating modes for the ZAdynpro in CANopen Lift mode:

- Velocity Mode (Velocity Mode [pv])



Velocity Mode

- Position Mode (Position Mode [pp]



Position Mode

The respective mode can be set in the ZAdynpro under "CAN/MODE". Most control systems, however, write the mode in the ZAdynpro shortly before start-up. This means that the operating mode must be set in the control system.
If the ZAdynpro is operated in position mode, the absolute shaft copy system must be connected to the same bus as the ZAdynpro.

The control system sends the required speed to the ZAdynpro before every journey. If this cannot be achieved, the ZAdynpro will initiate an arch travel journey. The maximum speed must therefore be entered in the control system.

1.2.1.4 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 ZAdynpro as reaction to a prior command from the control system

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

2 Emergency evacuation

2.1 General

- In the event of a mains failure, there is the possibility to carry out an emergency evacuation.
- By carrying out the emergency evacuation, the elevator cabin is driven into a floor or the ground floor.

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

2.2 Emergency evacuation with emergency power generator, 230 VAC

2.2.1 General

Requirements:

- For emergency evacuation with 230 VAC emergency power generator, the frequency inverter must provide the following voltage:
  – 230 VAC to feed L1 and L2

Characteristics of evacuation with emergency power generator, 230 VAC:

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

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

Process for emergency evacuation with 3-phase power supply:

- The ZAdynpro analyses the load ratio between the car and the counterweight during every start.
- Based on the load ratio, the ZAdynpro communicates to the control the direction in which the evacuation would be more energy saving.
- The control system starts the evacuation trip by activating:
  – Controller enable
  – Direction
  – Speed default

Size of the voltage supply

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

2.2.2 Parameterization

1.	**The following prerequisite 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

2.	**Detection of voltage drop:** Configure digital input in the **Control system** menu to **PARA2**. In case of a power failure, the input configured for 24 VDC is actuated in order to inform the frequency inverter that a switch-over to parameter set 2 is necessary.	Control ↳ f_I08 PARA2 ↳ PARA2 Function I_08

3.	**Inform the control system about the permissible direction of travel (optional):**	
	Standard	**DCP**
	In the **Control** menu, configure the digital output to **Evac.Dir** Control ↳ f_O4 Evac.Dir. ↳ Evac.Dir. Function O4 Contact open ⇦ Car is lighter than counterweight **Evacuation trip will be carried out upwards!** Output closed ⇦ Car is heavier than counterweight **Evacuation trip will be carried out downwards!**	Status byte 2, Bit 2 = 0 ⇦ Car is lighter than counterweight **Evacuation trip will be carried out upwards!** Status byte 2, Bit 2 = 1 ⇦ Car is heavier than counterweight **Evacuation trip will be carried out downwards!**

4.	**Evacuation type specification:** Configure the parameter **F_PARA2 = EVA. 1*AC** in the **Parameter set 2** menu.	Parameterset2 ↳ F_PARA2 EVAC1*AC ↳ EVAC1*AC Function parameterset 2
5.	**Copy parameter:** In the menu **Parameter set 2 / COPY**, select the function **PARA->2**. After copying, the parameter is once again OFF.	Parameterset2 ↳ 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.

2.3 Emergency evacuation with 230 VAC UPS

- The function is only available for operation with synchronous motors.
- 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!

In case of a mains failure, the UPS supplies the following voltage:
- 230 VAC to feed L1 and L2

Emergency evacuation process with 230 VAC UPS:
- The ZAdynpro analyses the load ratio between the car and the counterweight during every start.
- Based on the load ratio, the ZAdynpro communicates to the control the direction in which the evacuation would be more energy saving.
- The control system starts the evacuation trip by activating:
  – Controller enable
  – Direction
  – Speed default

2.3.1 Emergency evacuation with 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 for ZAdynpro electronics
+	Control systempower consumption
+	Electromechanical brakes power consumption
+	Other consumers (car light, …) power consumption
+	Motor power consumption for UPS operation with sufficient power (ask motor manufacturer)
=	**Real power UPS [W]**

2.3.2 Emergency evacuation with 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 for ZAdynpro electronics
+	Control systempower consumption
+	Electromechanical brakes power consumption
+	Other consumers (car light, …) power consumption
+	Motor power consumption for UPS operation with reduced power (ask motor manufacturer)
=	**Real power UPS [W]**

2.3.3 Parameterization

1.	**The following prerequisite 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

2.	**Detection of voltage drop:** Configure digital input in the **Control system** menu to **PARA2**. In case of a power failure, the input configured for 24 VDC is actuated in order to inform the frequency inverter that a switch-over to parameter set 2 is necessary.	Control ↳ f_I08 PARA2 ↳ PARA2 Function I_08

3.	**Inform the control system about the permissible direction of travel (optional):**		
	Standard	**DCP**	**CANopenLift**
	In the **Control** menu, configure the digital output to **Evac.Dir** Control ↳ f_O4 Evac.Dir. ↳ Evac.Dir. Function O4 Contact open ⇦ Car is lighter than counterweight **Evacuation trip will be carried out upwards!** Output closed ⇦ Car is heavier than counterweight **Evacuation trip will be carried out downwards!**	Status byte 2, Bit 2 = 0 ⇦ Car is lighter than counterweight **Evacuation trip will be carried out upwards!** Status byte 2, Bit 2 = 1 ⇦ Car is heavier than counterweight **Evacuation trip will be carried out downwards!**	Object 0x6049 = 1: Cabin is lighter than the counterweight **Evacuation trip will be carried out upwards!** Object 0x6049 = 2: Cabin is heavier than the counterweight **Evacuation trip will be carried out downwards!**

4.	**Evacuation type specification:** Configure the parameter **F_PARA2 = UPS** in the **Parameter set 2** menu.	Parameterset2 ↳ F_PARA2 UPS ↳ UPS Function parameterset 2
5.	**Specification of the stator resistance for synchronous motors:** In the **Parameter set 2 / R_U20** menu, enter the stator resistance of the synchronous motor used	Parameterset2 ↳ R_U20 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.	Parameterset2 ↳ P_UPS 1.0 kW ↳ 1.0 Max. load on UPS

Calculating the available UPS power:

$x_{1\ \text{rating plate}}$
- Control systempower consumption
- Electromechanical brakes power consumption
- Other consumers (car light, …) power consumption

= **Available UPS_power [W]**

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

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

CAUTION!

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

7.	**Copy parameter:** In the menu **Parameter set 2 / COPY**, select the function **PARA->2**. After copying, the parameter is once again OFF.	Parameterset2 ↳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 the times in which the motor is kept at speed 0:**	
	Configure in the **Start/T_3 = 0** menu	Commissioning ↳T_3 0.0 s ↳ 0.0 Hold speed=0
	Configure in the **Stop/T_4 = 0** menu	Stop ↳T_4 0.0 s ↳ 0.0 Hold speed 0

2.4 Evacuation with 3-phase mains supply 3~400 VAC

2.4.1 General

Requirements:
- For the emergency evacuation with 3-phase mains supply, the mains supply must provide the following voltage to the frequency inverter:
  – 3~400 VAC to feed L1, L2 and L3.

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

Process
- The ZAdyn analyses the load ratio between the car and the counterweight during every start.
- Based on the load ratio, the ZAdyn communicates to the control the direction in which the evacuation would be more energy saving.
- The control system starts the evacuation trip by activating:
  – Controller enable
  – Direction
  – Speed default

Size of the voltage supply

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

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

2.4.2 Parameterization

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

	Standard	DCP	CANopenLift
1.	24 V signal on input configured to "RV2"	Command byte 1, Bit 4 has 1-signal	Evacuation direction object 0x6049

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 power failure, the input configured for 24 VDC is actuated in order to inform the frequency inverter that a switchover to parameter set 2 is necessary.

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

	Standard	DCP	CANopenLift

3.	In the **Control** menu, configure the digital output to **Evac.Dir**
	`Control`
	`↳ f_O4  Evac.Dir.`
	`  ↳  Evac.Dir.`
	`Function O4`
	Contact open ⇦ Car is lighter than counterweight
	Evacuation trip will be carried out upwards!
	
	Output closed ⇦ Car is heavier than counterweight
	Evacuation trip will be carried out downwards!
		Status byte 2, Bit 2 = 0 ⇦ Car is lighter than counterweight
		Evacuation trip will be carried out upwards!
		
		Status byte 2, Bit 2 = 1 ⇦ Car is heavier than counterweight
		Evacuation trip will be carried out downwards!
			Object query 0x6049 Evacuation direction by control
			
			Value 1 -> Car is lighter than counterweight, evacuation travel upwards.
			
			Value 2 -> Car is heavier than counterweight, evacuation travel downwards.

(4) Evacuation type default
Configure the parameter **F_PARA2 = EVA. 3*AC** in the **Parameter set 2** menu.

```
Parameterset2
↳ F_PARA2 EVA.3*AC
  ↳       EVA.3*AC
Function parameterset 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.

```
Parameterset2
↳ COPY    Off
  ↳       Para1⇦2
Copy parameter
```

Information
The power failure detection and type of evacuation must be parameterised before copying the parameters. It is possible to reduce the required power during the evacuation. The values for speed and acceleration have to be adjusted in the 2.nd parameter set for this.

2.5 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.

2.5.1 Parameterization

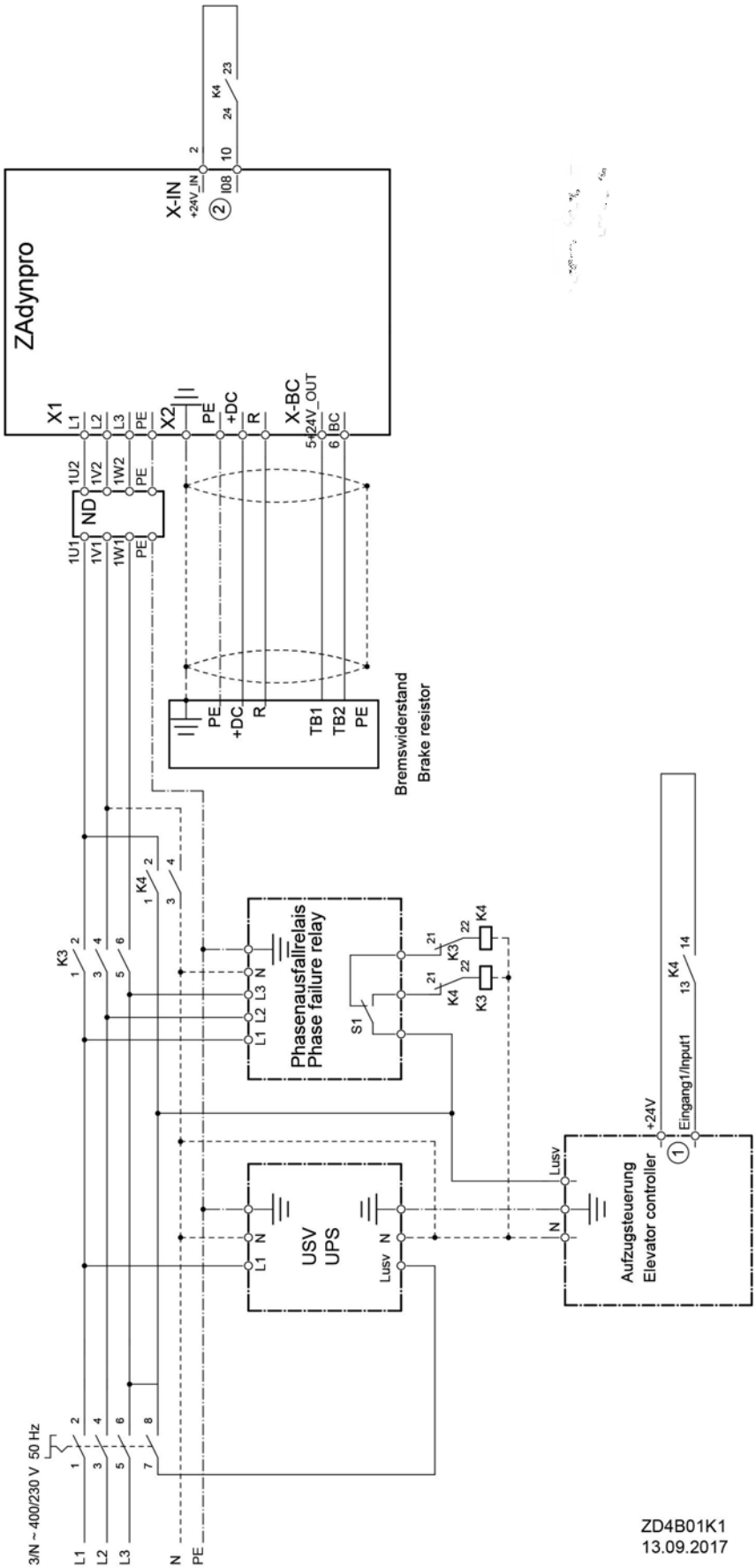
1.	Configure in the **Parameter set 2 / STOP = ON** menu Brake is already closed when the switch off for the speed V_1is reached.	2nd parameter set ↳ STOP ON ↳ ON Stop function

	Standard	**DCP2 / DCP4**
2.	Brake is already closed when the switch off for the speed V_1is reached.	Determine overshoot path at the flush position under full load Set parameters in the **Control/DCP_STP = ... mm** menu Control ↳ DCP_STP 35 mm ↳ 35 Stop before flush 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**.

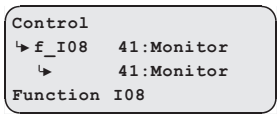
2.6 Plan for connecting UPS to ZAdynpro



1 Function input 1: Monitoring power failure
2 Function input X-IN:I08 = PARA2

2.7 Monitor function

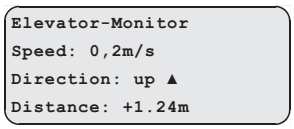
Monitoring of evacuation direction and evacuation speed during the evacuation process.
The monitoring function will be activated by a digital input.



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

Activating of the monitoring function

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

	**Elevator-Monitor** **Speed:** Display of the actual evacuation speed **Direction:** Display of the actual evacuation direction ▲ Evacuation speed < Limit V_G1 ▲▲ Evacuation speed > Limit V_G1 **Distance:** Display of the evacuation distance past

Information
With activated monitor function, all further functions of the ZAdynpro are locked!

2.8 Stutter brake function

2.8.1 General

The stutter brake function can be used for an emergency evacuation with electric manually vented brakes. The function brakes the movement of the elevator cabin and prevents uncontrolled acceleration.

2.8.2 Operation modes

The stutter brake function works in two ways:
- Speed-dependent cycle
- time cycle

Speed-dependent cycle
The digital output configured for the **Stutter br.** function is switched depending on the limit value V_G1.

The speed-dependent cycle includes the following steps, which are repeated in turn:
- If the speed of the elevator cabin exceeds the limit value configured in the parameter **V_G1**, the contact for the digital output is opened.
- The brake is closed.
- The speed falls below the limit value.
- The contact is closed.
- The brake is opened.
- The limit value is exceeded.

The speed-dependent cycle is carried out automatically if
- an emergency rescue is performed and, at the same time,
- the rotary encoder is functional

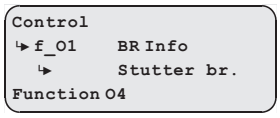
Time cycle:
The digital output configured for the **Stutter br.** function is switched based on time. This opens and closes the brake at a frequency of 0.5 Hz.

The time cycle is carried out automatically if
- the elevator installation is stopped or
- the rotary encoder is defective

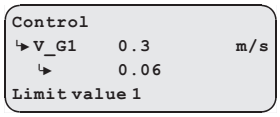
At the same time
- the brake release monitor must be deactivated or
- the brake release monitor must be activated and the microswitch or the inductive proximity switches for the brake must report to the ZAdynpro that the brake is open.

2.8.3 Parameterization

To activate the stutter brake function, a digital output in the **Control** menu is configured to the **Stutter br.** function.



The limit value V_G1 is entered in the parameter **Control/V_G1**. It is recommended to set the limit value V_G1 to 0.06 m/s.



The cabin speed can be changed by adjusting the parameter **Control/V_G1**.

2.8.4 Circuit suggestions

The following circuit suggestions are available at www.ziehl-abegg.com/service/downloads:
- Stutter brake ZAdyn4 (principle circuit diagram), drawing number: ZD4C01K10
- Stutter brake ZAdyn4 + ZAsbc4 (principle circuit diagram), drawing number: ZD4C01K11
- Stutter brake ZAdynpro + ZAsbc4B, drawing number: ZD4B01K2

3 Error diagnosis

3.1 Travel abort and acknowledgement during malfunctions

3.1.1 Travel abort

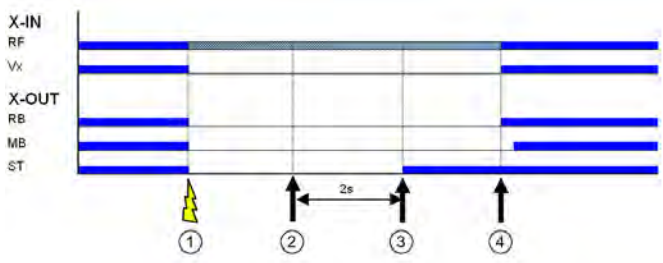
- If the ZAdynpro detects an error, the current travel program is aborted and the following outputs are switched off immediately:
  – ST – Malfunction
  – RB - Controller ready
  – MB – mechanical brake
- The open loop control must immediately:
  – Close the electromechanical brake
  – STO- interruption or opening of the motor contactors
- 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.

3.1.2 Acknowledgement

Acknowledging the error is performed automatically 2 seconds after the cause of the error has been eliminated.
The prerequisite is that there are no input signals for travel speeds. If travel signals are applied before the end of 2 seconds, there will be no error acknowledgement.

The following errors are not automatically acknowledged:

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



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

3.2 LED

There is an LED on the ZAdynpro for diagnosis.

1 Location of LED ZAdynpro 011-032

1 Location of LED ZAdynpro 040-074

Status of the ZAdynpro with standard actuation

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

Condition of the DCP connection

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

Condition of the CAN connection

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

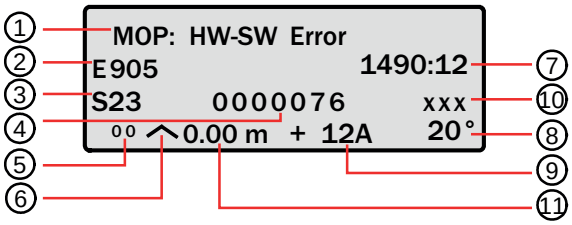
It is possible, that an operation condition and an error state occur at the same time and that they are indicated by the LED at the same time.

3.2.1 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

3.3 Readout the error memory

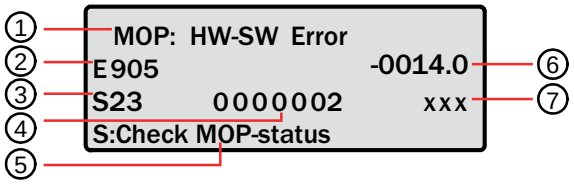
Faults which lead to interruption of the travel are saved in a fault list.
The fault list can be found in menu **Statistik/ST_LST**. Up to 64 error messages can be managed. Once the number of 64 messages has been reached, the oldest entry in each case is deleted for each new error message which arises. 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 tha car in the shaft

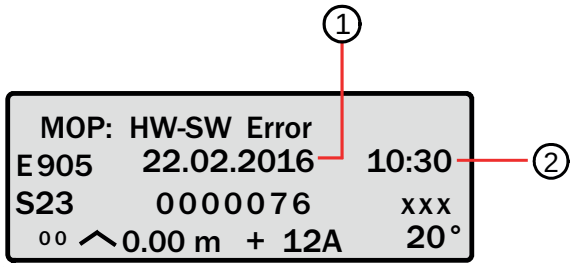
Please refer to the "Error diagnosis“ chapter for a description of the error number and the operating status.

The following information is displayed when the error list is opened and the i 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 Additional information (option)

In CANopen lift and DCP operation, the time and date when an error occurs are saved in the error list and displayed.



1 Date when the error occurred
2 Time at which the error occurred

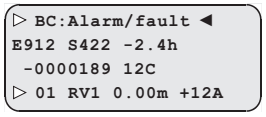
Scroll through fault list:
the fault list can be scrolled through using the two arrow keys.


Scroll up (reduce fault serial number)


Scroll down (increase fault serial number)

Determine time of fault


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



Information text display
If an error message is displayed or the error list is opened, an information text about the error message can be displayed. To do this, press the i key. The prerequisite is that a memory card on which the information texts are saved is inserted in the X-MMC card slot.

3.4 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)

3.5 Recorder function

The recorder function records measuring channels during travel. This makes it easier to determine the cause of an error if any errors should occur. The measurements can be saved in a zr4 file on the memory card.

If an error occurs during travel, the zr4 file is automatically saved if there is an SD card in the X-MMC card slot and there is no memory card in the ZApad card slot.

Saving the Zr4 file: After travel, configure the **Memory Card/SAV_ALL=On** parameter

3.6 Error list

3.6.1 Mask-function

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 **M**.

CAUTION!

Danger
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 inverter.

3.6.2 Negative error screen

Inactive errors can be activated by entering the corresponding error number in the negative error screen (see “Parameter list/Monitoring menu” chapter). The inactive errors are indicated by a note in the error list.

3.6.3 Block function

Blocks the ZAdyn if certain errors occur several times in succession. The errors must occur in directly consecutive travel tests. The fault counter is reset to 0 after completion of fault-free travel.
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 2rd error
- Lock n.1: Lock function after 1 malfunction1. Output "ST" remains dropped after the 1st error

Errors which lead to locking of the ZAdynpro are identified by a **dot** in the **S** column.

3.6.4 Notes 0xx

Information about:
- Error memory content
- Changes in the operating statuses
- Application of special frequency inverter functions

Note-No.	Note text	Designation	M	S
000	Memory empty	EEPROM is empty		
001	No error text	EEPROM is empty		
010	Software update	Software update was carried out		
020	MOT_TYP changed	On ZAdynpro only. Motor type in "Motor name plate" was changed		
040	Line Fault	On ZAdyn4Bplus only. **Cause:** A phase of the supply network was not detected 30s after switching on **Remedy:** Check line voltage		
077	ST_LST: locked	The last error entered occurred more than 5 times in succession	•	
080	Mode: EVA ->Norm	Switchover from evacuation to normal mode was implemented		

Note-No.	Note text	Designation	M	S
081	Mode: Standard->EVA	Switchover from normal to evacuation to mode was implemented		
085	Mode: Safety Brk	Capture release (safety brake function)performed		•

3.6.5 Error 1xx

- Hardware configuration error
- Software error

Error no.	Error text	Error cause	M	S
108	HW-IDENT:Incorrect no.”,	**Cause:** The ID no. of an assembly is not known **Remedy:** Update software (www.ziehl-abegg.com)		
110 120	CU: No ID	**Cause:** ID no. of processor board (CU) is not recognised **Remedy:** Please contact ZIEHL-ABEGG Customer Service		
111	CUSH missing	**Cause:** ID no. of the shunt module (CUSH) is not recognised **Remedy:** Please contact ZIEHL-ABEGG Customer Service		
115 125	SP missing	**Cause:** ID no. of the switching power supply board (SP) is not recognised **Remedy:** Please contact ZIEHL-ABEGG Customer Service		
116 126	PP missing	**Cause:** ID no. of the power unit board (PP) is not recognised **Remedy:** Please contact ZIEHL-ABEGG Customer Service		
117 127	MP missing	**Cause:** ID no. of the power unit board (MP) is not recognised **Remedy:** Please contact ZIEHL-ABEGG Customer Service		
118	PU missing	**Cause:** ID no. of the power unit board (PU) is not recognised **Remedy:** Please contact ZIEHL-ABEGG Customer Service		
119	DC missing	**Cause:** ID no. of the DC-link board (DC) is not recognised **Remedy:** Please contact ZIEHL-ABEGG Customer Service		
121	CUSH: ID-Error	**Cause:** Prohibited combination of assemblies (CUSH) **Remedy:** Please contact ZIEHL-ABEGG Customer Service		
130	Hardware unknown	**Cause:** The ID no. of an assembly is not known **Remedy:** Update software (www.ziehl-abegg.com)		
131	INFB conflict	**Cause:** The ID no. of an assembly is incorrect **Remedy:** Please contact ZIEHL-ABEGG Customer Service		
140	MP:Unknown IGBT	**Cause:** Unknown IGBT module **Remedy:** Please contact ZIEHL-ABEGG Customer Service		
150	HW conflict	**Cause:** Assemblies (SH, PP, MP) are not compatible **Remedy:** Please contact ZIEHL-ABEGG Customer Service		
160	ADC adj.:outside tol.	**Cause:** Incorrect measured values from current recording during switch-on **Remedy:** Switch the ZAdyn off and back on. Please contact ZIEHL-ABEGG Customer Service	•	
174	CUMT:Not detect	**Cause:** Board for monitoring the motor temperature is not recognised. **Remedy:** Check that the board is installed correctly. In the “Monitoring” menu, set the parameter “P1P2 = Off”. Replace the board	•	•

3.6.6 Error 2xx

- Configuration error

Error no.	Error text	Error cause	M	S
200	Stop input	**Cause:** When activating a travel command using the elevator control, a parameter for changing the speed is selected **Remedy:** End parameter inputs	•	
201	Motor name plate	**Cause:** A parameter in the “Motor name plate” menu is set to “0” **Remedy:** Check the parameter in the "Motor name plate" menu,		
203	n* = 0	**Cause:** In the “Installation data” menu, the “n*” parameter is set to “0” **Remedy:** Enter the "n*" parameter		
205	Input duplicated	**Cause:** Two digital inputs are assigned the same function **Remedy:** Correct the function allocation of the digital inputs in the “Control system” menu		

Error no.	Error text	Error cause	M	S
206	n* > 1.2204 *.n	**Cause:** The calculated motor speed “n*” in the “Installation data” menu is at least 20% above the set nominal speed “n” in the “Motor name plate” menu for the motor **Remedy:** Check system data Check motor data	•	
207	Input PFU_BR miss.	**Cause:** When using a power recuperation unit in conjunction with a brake resistor temperature monitoring of the brake resistor is not programmed **Remedy:** Configure a digital input (preferably “X_BR4”) in the “Control system” menu to the “PFU_BR” function		
208	DELAY active	See error 355 “FastStp active”.		
210	Wrong ENC_TYP	**Cause:** Rotary encoder type (motor) and motor type do not match **Remedy:** Enter the correct rotary encoder type for the “ENC_TYP” parameter in the “Encoder & BC” menu Enter the correct motor type for the “MOT_TYP” parameter in the “Motor name plate” menu	•	
213	ZR_EN /ZR_RDY miss-ing	**Cause:** When using a ZArec4C power recuperation unit, the “ZR_RDY” or “ZR_EN” functions have not been configured **Remedy:** In the “Control system” menu, configure a digital input to the “ZR_RDY” function In the “Control system” menu, configure a digital output to the “ZR_EN” func-tion		
215	No HIPER/CODEFACE	**Cause:** An absolute encoder (motor) with Hiperface or Codeface interface has been selected - these encoder types cannot be used with the ZAdynpro **Remedy:** In the “Encoder & BC” menu, set the “ENC_TYP” parameter to the correct absolute encoder Replace the absolute encoder on the drive		
220	Error: SM data	**Cause:** In the “Motor name plate” menu, the values for the rated speed “n” and the rated frequency “f” are contradictory **Remedy:** Correct the “n” and “f” parameters (n = fx60/p)	•	
221	Error:ASM data	**Cause:** In the “Motor name plate” menu, the values for the rated speed “n” and the rated frequency “f” are contradictory **Remedy:** Correct the “n” and “f” parameters	•	
231	V_G1 > 150% V*	**Cause:** In the “Control system” menu, the configured limit value “V_G1” is too high **Remedy:** Configure the limit value “V_G1” to max. 150% of the value of “V*” (“Installation” menu)		
232	V_G2 > 150% V*	**Cause:** In the “Control system” menu, the configured limit value “V_G2” is too high **Remedy:** Configure the limit value “V_G2” to max. 150% of the value of “V*” (“Installation” menu)		
233	V_G3 > 150% V*	**Cause:** In the “Control system” menu, the configured limit value “V_G3” is too high **Remedy:** Configure the limit value “V_G3” to max. 150% of the value of “V*” (“Installation” menu)		
240	ZR:Not RDY	See error 345 “ZR: Not RDY”.		
250	Disc: No Enc Adj.	See error 341 “Disc: No Enc Adj.”.		
251	Disc: Wrong ENC_INC	**Cause:** An invalid value has been set for the “ENC_INC” parameter (motor rotary encoder) in the “Rotary encoder & BC” menu **Remedy:** Correct the “ENC_INC” parameter	•	
252	Disc:EncInc deviance	See error 552 “Disc:EncInc deviance”		
260	V_EXT active!	See error 360 “V_EXT active”.		
270	Cable change warning	See error 370 “Cable change warning”.		
280	Decel. distance too long	**Cause:** The calculated deceleration path from travelling speed “V_3” to a standstill (S30) is too long **Remedy:** Increase the deceleration “A_NEG” in the “Deceleration” menu In the “Deceleration” menu, reduce the roundings “R_NEG1” and “R_NEG2” In the “Travel” menu, reduce the travelling speed “V_3”		

Error no.	Error text	Error cause	M	S
281	UF: No Pos. Mode	**Cause:** U/f operation (without encoder) in conjunction with CAN position mode or DCP04 control is not permissible **Remedy:** Change the “Config” parameter to DCP03 in the “Control system” menu Change the control type in the elevator control to CAN Velocity mode	•	
284	CC_OFF is on	**Cause:** The travel curve computer is switched off **Remedy:** In the “ZA-Intern” menu, set the “CC_OFF” parameter to “OFF”	•	
285	Installation:V*=0	**Cause:** In the “Installation data” menu, the “V*” parameter is set to “0” **Remedy:** Enter the “V*” parameter		
287	V_1...V_7 > V*	**Cause:** In the “Travel” menu, one of the travelling speeds “V_1 … V_7” is higher than the nominal speed “V*” set in the “Installation data” menu **Remedy:** Check speeds “V_1 … V_7” Check “V*”		
289	V_1 < V_2 < V_3	**Cause:** Speeds are set incorrectly in the “Travel” menu **Remedy:** Set “V_1” to less than “V_2” Set “V_2” to less than “V_3”	•	
290	Para.set2 empty	**Cause:** Parameter set 2 was not preallocated before activation **Remedy:** In the “Parameter set 2” menu, set the “F_PAR2” parameter to the desired operating mode		

3.6.7 Error 3xx

- Error before trip start

Error no.	Error text	Error cause	M	S
301	MOP: Timeout	**Cause:** There is no communication between the application and motor management processor during start-up **Remedy:** For sporadic occurrence: Check EMC-compatible installation (screening, etc.) For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service		•
303	MOP: SW-Error	**Cause:** Software error message from the motor management processor **Remedy:** Switch the ZAdyn off and back on Reset ZAdyn to delivery condition: Enter the “RESET = 77” parameter in the “Statistics” menu Perform a software update	•	•
304	MOP: HW-Error	**Cause:** Overvoltage detected in DC-link Memory error Error in measured value recording **Remedy:** Switch the ZAdyn off and back on Reset ZAdyn to delivery condition: Enter the “RESET = 77” parameter in the “Statistics” menu Perform a software update	•	•
306	ADC calibration??	**Cause:** Zero point adjustment for motor current detection (analog-digital converter) is outside of tolerance **Remedy:** Switch the ZAdyn off and back on Replace defective shunt module	•	•
308	Iu Iv not 0A	**Cause:** A motor current is measured even when stopped Current detection defective **Remedy:** Check shunt module Switch the ZAdyn off and back on	•	•
310	ENC: No AWG	**Cause:** The absolute encoder (motor) was not recognised at the start of travel **Remedy:** Check the connection of the absolute encoder Check the setting for the “ENC_TYP” parameter in the “Encoder & BC” menu for further information, see the “Rotary encoder” info menu	•	•
311	ENC:Resolution	**Cause:** In the “Encoder & BC” menu, the “ENC_INC” parameter setting does not match the resolution of the absolute encoder (motor) **Remedy:** Set “ENC_IN” to the correct resolution for further information, see the “Rotary encoder” info menu		

Error no.	Error text	Error cause	M	S
312	HIPER:Status error	On ZAdyn4C and ZAdyn4Bplus only. See error 336 "ENC: Faulty"		
313	HIPER:No incr. mode	On ZAdyn4C and ZAdyn4Bplus only. See error 336 "ENC: Faulty"		
314	HIPER:Alarm	On ZAdyn4C and ZAdyn4Bplus only. See error 335 "ENC: Warning"		
321	EnDat: ULP-error	See error 335 "ENC: Warning"		
322	EnDat: Com-Fehler	See error 337 “ENC:Comm. Error”.		
324	SSI: Ack-Error			
325	SSI: Timeout			
327	ENC: Read-Error			
328	ENC: Count-Dif	**Cause:** Excessive difference between the absolute position read out and the position calculated from the pulses **Remedy:** Check absolute value encoder Check rotary encoder line Check rotary encoder connection (e.g. shielding)		
330	ENC:Sinus-Error F	See error 337.		
331	ENC: Error NDEF	**Cause:** Faulty communication with absolute encoder (motor) **Remedy:** Check the absolute encoder cable Check the absolute encoder type connected Check EMC-compatible installation of system (screening of motor and BR cable) for further information, see the “Rotary encoder” info menu		●
332	ENC: 1387 CD=0	**Cause:** Input voltages for signal tracks C and D of the absolute encoder type ERN1387 are both zero **Remedy:** Check absolute value encoder Check rotary encoder line Check rotary encoder connection		
333	ENC:Ill. Counter	**Cause:** The absolute value determined (motor rotary encoder) is invalid **Remedy:** Switch the ZAdyn off and back on Check the “ENC_TYP” and “ENC_INC” parameters in the “Encoder & BC” menu for further information, see the “Rotary encoder” info menu		●
335	ENC: Warning	**Cause:** The absolute encoder (motor) is transmitting a warning which indicates an imminent failure **Remedy:** The absolute encoder must be replaced as quickly as possible In the “Monitoring” menu, one of the “MASKx” parameters can be temporarily set to 335 to mask the error	●	●
336	ENC: Faulty	**Cause:** The absolute encoder (motor) is probably faulty **Remedy:** Switch the ZAdyn off and back on Replace the absolute encoder		●
337	ENC: Comm. Error	**Cause:** Faulty communication with absolute encoder (motor) **Remedy:** Check the “ENC_TYP” and “ENC_INC” parameters in the “Rotary encoder & BC” menu Check the connection of the absolute encoder Check EMC-compatible installation (screening of rotary encoder cable, motor cable, BR cable, etc.) for further information, see the “Rotary encoder” info menu Contact the ZIEHL-ABEGG hotline Replace the absolute encoder		●
340	Disc:magnet miss.	**Cause:** A magnet in the DISCcontrol positioning system was not detected at the expected position during the previous travel **Remedy:** Stick on the magnet in the right position Attach any magnet that may have dropped off Set the Hall sensor to the correct distance Check the clearance of the traction sheave bearing	●	●

Error no.	Error text	Error cause	M	S
341	Disc: No Enc Adj.	**Cause:** Magnet adhesion process was not performed **Remedy:** In the “Rotary encoder adjustment” menu, select the “ENC_ADJ” parameter and perform the magnet adhesion process		
345	ZR: Not RDY	**Cause:** There is no signal at the digital input configured for the “ZR_RDY” function at the start of travel **Remedy:** Exit the ZArec configuration level Check whether there is an error on the ZArec In the “Encoder & BC” menu, check the “BC_TYP = ZArec” parameter Check the wiring between ZAdyn and ZArec		
346	BR: T2 too small	**Cause:** The brake is not detected as open at the start of travel Brake does not open Brake release monitoring switch does not switch **Remedy:** Check brake release monitoring Check brake actuation Check the opening time of the brakes In the “Start-up” menu, check the “T_2” parameter and increase if necessary Check the configuration of the brake release monitoring (“Monitoring” and “Control system” menu)	•	•
347	CO: ON!?	**Cause:** The motor contactors are not detected as closed at the start of travel Motor contactors do not switch Auxiliary contacts of the motor contactors do not switch **Remedy:** Check contactor monitoring Check the wiring of the motor contactors Check the supply voltage to the motor contactors Check the contactor monitoring supply voltage In the “Monitoring” menu, check the “CO” parameter	•	•
348	STO: remains	**Cause:** At the start of travel, after 2.5 s, there are no STO_A and STO_B signals at the X-STO connection terminal **Remedy:** Check the control wiring Check the relay supply voltage Check the control voltage of the STO signals When using the ZAsbc4: Reset the ZAsbc4 by switching it off and back on		•
349	STO: No trav. sig.	**Cause:** After actuation of the STO_A and STO_B inputs, no elevator control travel signal was registered within 2.5 s **Remedy:** Check the elevator control with regard to travel signals Check actuation of the STO inputs With parallel control, check the wiring of the digital control inputs Check the status of the serial control (CAN, DCP) using the status LED on the ZAdyn		
350	Temp:Sens defective	**Cause:** The temperature sensor for the power unit is not detected. The ZAdyn carries out further journeys with a reduced PWM frequency of 4 kHz and maximum fan power **Remedy:** Not possible, replace ZAdyn as soon as possible Contact the ZIEHL-ABEGG hotline	•	
355	FastStp active	**Cause:** The “Limited emergency stop” function is already active at the start of travel **Remedy:** Check the setting of the digital inputs in the “Control system” menu Check the control and wiring of the input for the “/FastStp” function		•
360	V_EXT active	**Cause:** When connected to line voltage, the external 24 VDC voltage supply to the processor board (CU) exceeds the internal voltage supply by 1 VDC **Remedy:** Remove the external 24 VDC voltage supply Reduce the voltage of the external 24 VDC	•	•
365	Travel at MB=OFF	**Cause:** Movement of the drive is detected although the “MB” output is deactivated **Remedy:** Check the motor brake for sufficient brake torque Check the dropout time of the brake The motor brake must be actuated at the same time as the relay for the “MB” output function is switched	•	•

Error no.	Error text	Error cause	M	S
370	Suspension means warning	**Cause:** Direction change counter information The suspension means must be replaced in approx. 1 year **Remedy:** Replace the suspension means before the direction change counter has reached zero	●	
372	ENC:No Abs.value	See error 337 “ENC:Comm. Error”.		
373	ENC:No Abs.End			
374	P1P2:short-circuit	**Cause:** The measured resistance at the “X-MT” terminal is less than 20 Ohm when “P1P2 = PTC” motor temperature monitoring is set in the “Monitoring” menu **Remedy:** Check the motor temperature monitoring connection Check the “P1P2” parameter in the “Monitoring” menu	●	
375	MOT:Temp.warning	**Cause:** The determined motor temperature is too high at the start of travel **Remedy:** Check the temperature sensor (motor) connection at terminal X-MT Check whether there the motor is overheating Remedy the cause of the motor overheating (reduce duty cycle, check load ratios in the system, check motor parameters, adjust the absolute encoder on synchronous machines, cool the motor etc.)	●	
376	STO: Temp. alarm	See error 976 “STO: Temp. alarm"		
377	BRxx:Temp.warning	**Cause:** The calculated power loss of the brake resistor exceeds the nominal power by 25 % **Remedy:** Check the “BC_TYP” parameter in the “Encoder & BC” menu If “BC_TYP” = “BRxx” in the “Encoder & BC” menu, check the “R_BR” and “P_BR” parameters Remedy the cause of the resistor overload (reduce duty cycle, check the load ratios in the system etc.)		
378	MP: Not active	**Cause:** The voltage supply to the power unit was not active at the start of travel **Remedy:** Contact the ZIEHL-ABEGG hotline		●
379	MP:Temp.warning	**Cause:** The temperature of the power unit is too high at the start of travel **Remedy:** Check the function of the unit fan Check the ambient temperature Remedy the cause of overheating (reduce duty cycle, check load ratios in the system, check motor parameters, adjust the absolute encoder on synchronous machines etc.)	●	
380	BR: Start-Error	**Cause:** At least one brake is detected as released before the start of travel when brake release monitoring is activated **Remedy:** In the “Monitoring” menu, check the “BR” parameter to make sure the correct number is set and check the switching logic (NO / NC) of the monitoring contacts Check that the monitoring contacts are connected correctly Check the function of the monitoring contacts		●
395	MP:ERR_EXT active	**Cause:** An internal device error occurs at the start of travel **Remedy:** Switch the ZAdyn off and back on Contact the ZIEHL-ABEGG hotline	●	●

3.6.8 Error 4xx

- Travel abort to protect the ZAdynpro
- Voltage monitoring
- Overvoltage Brake resistor / Brake-Chopper
- Power stage temperature recording
- Current monitoring

Error no.	Error text	Error cause	M	S
410	ADC:Overcurrent	**Cause:** A motor overcurrent has been detected **Remedy:** Check the motor connection for short circuit and earth fault Check the phase sequence of the motor connection (U->U; V->V; W->W) Check the connection and function of the rotary encoder (for further information, see the “Encoder” info menu) Check the absolute encoder adjustment Check the motor data in the “Motor name plate” menu Reduce the “SPD_KP” parameter in the “Controller” menu Reduce the “K_START” parameter in the “Start-up” menu For open loop operation (asynchronous operation without sensors): Configure the **Control/UF_ED=On** parameter and then gradually increase the **Control/I_IxR** parameter. Do not exceed a maximum value of 1.5 x nominal motor current!		●
412	MOT: UVW missing	**Cause:** The motor test current was not reached at the start of travel **Remedy:** Check the motor connection and motor cable Contact ZIEHL-ABEGG Customer Service	●	
415	MOT: Current UVW	**Cause:** The sum of the currents U, V, W is not equal to 0 **Remedy:** Check the motor connection for short circuit and earth fault	●	●
420	MP: Temp. alarm	**Cause:** Overtemperature on power unit **Remedy:** Check the function of the unit fan Check the ambient temperature Remedy the cause of overheating (reduce duty cycle, check load ratios in the system, check motor parameters, adjust the absolute encoder on synchronous machines etc.)		●
431	MP: PWM fail	**Cause:** Internal device error, pulse width modulation has been switched off **Remedy:** Check rotary encoder connection For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service For sporadic occurrence: Check EMC-compatible installation (screening, etc.)		●
435	MP: PWM on	See error 935 “MP: PWM on"		
450	MP: Overload	**Cause:** The maximum output current of the ZAdyn has been exceeded for more than 10 s **Remedy:** Check the connection and function of the rotary encoder (for further information, see the “Encoder” info menu) Check motor data Check the weight compensation Check opening of the brake (motor) Check the absolute encoder adjustment Check the required motor power and unit size Check that the cabin and counterweight engage easily	●	●
451	MP: Overload	**Cause:** ZAdyn output current was greater than 130 % at a very low speed for 1 s **Remedy:** Check the system for mechanical blockages Check the connection and function of the rotary encoder (for further information, see the “Encoder” info menu) Check motor data Check the weight compensation Check opening of the brake (motor) Check the absolute encoder adjustment Check the required motor power and unit size	●	●

Error no.	Error text	Error cause	M	S
452	MP: Overload	**Cause:** ZAdyn output current was too high for a certain duration (IIt monitoring). At low speeds and with large variations between the nominal and actual speed, the current is weighted correspondingly higher **Remedy:** Check that car and counterweight engage easily Check the connection and function of the rotary encoder (for further information, see the “Encoder” info menu) Check motor data Check the weight compensation Check opening of the brake (motor) Check the absolute encoder adjustment Check the required motor power and unit size	●	●
470	DC: U < UDC_MIN	See error 970 “DC: U < UDC_MIN".	●	
471	DC: U > UDC_MAX	**Cause:** DC-link voltage has exceeded the maximum voltage during travel **Remedy:** Check the connection, function and design of the brake chopper/-brake resistor, In the “Power unit” menu, check the parameters for “UDC_MAX”, In the “Encoder & BC” menu, check the “BC_TYP” parameter In case of poor travel behaviour (vibration), check the “SPD_KP” parameter in the “Controller” menu If the error occurs during deceleration, reduce the “A_NEG” parameter or increase “R_NEG1” in the “Deceleration” menu	●	
472	Failure of a phase	See error 972 “Line failure”.		
475	DC: U > 850 V	See error 975 “DC: U > 850V”.		
480	MP: Overcurrent	**Cause:** Overcurrent has been detected at the motor output **Remedy:** Check the motor connection for short circuit and earth fault Check the phase sequence of the motor connection (U->U; V->V; W->W) Check the connection and function of the rotary encoder (for further information, see the “Encoder” info menu) Check the absolute encoder adjustment Check the motor data in the “Motor name plate” menu Reduce the “SPD_KP” parameter in the “Controller” menu Reduce the “K_START” parameter in the “Start-up” menu For open loop operation (asynchronous operation without sensors): Configure the **Control/UF_ED=On** parameter and then gradually increase the **Control/I_IxR** parameter. Do not exceed a maximum value of 1.5 x nominal motor current!		●
484	MP: Overcurrent R	**Cause:** Overcurrent has been detected at the output for the brake resistor **Remedy:** Check the brake resistor connection for short circuit and earth fault Check the type of brake resistor used (see operating instructions, “Brake resistor allocation” chapter)		●
485	Intermediate circuit overcurrent	**Cause:** The DC-link current sensor has detected an overcurrent **Remedy:** Check the brake resistor connection for short circuit and earth fault Check the type of brake resistor used (see operating instructions, “Brake resistor allocation” chapter) Check the motor connection (short circuit, earth fault) Check rotary encoder connection Disconnect the cables at terminals U, V, W and R and send a travel signal. If the error persists, there is a defect in the unit. In this case, contact ZIEHL-ABEGG Customer Service		●
488	MP: Current recording	**Cause:** An overcurrent was detected before travel **Remedy:** Consult ZIEHL-ABEGG customer service		
497	SW: System check	See error 982 “SW error (T>4.5ms)”.		

3.6.9 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	See error 365 “Travel with MB=OFF”.	●	●
503	No starting	**Cause:** No rotary encoder signal (motor) has been detected yet after the time “T_ENC” in the “Monitoring” menu has elapsed **Remedy:** Check opening of the brake Check the time “T_ENC” in the “Monitoring” menu Observe the value “Cnt” in the “Encoder” info menu when turning the motor shaft (e.g. by releasing the brake). As the shaft turns, the value must continuously rise/fall Check rotary encoder connection Check the setting for the “ENC_TYP” parameter in the “Encoder & BC” menu	●	●
504	ENC:Sig.Underv.	**Cause:** No more signals from the rotary encoder (motor) are detected during travel **Remedy:** Motor shaft rotating continuously: - Check rotary encoder connection - Observe the value “Cnt” in the “Encoder” info menu when turning the motor shaft (e.g. by releasing the brake). As the shaft turns, the value must continuously rise/fall, Motor shaft stops during travel: - Check whether brake has engaged during travel - For ASM: Check the motor data - Check the motor connection (U-U, V-V, W-W) - Increase the “SPD_KP” parameter in the “Controller” menu	●	●
505	No motor movement	**Cause:** No signals detected by the rotary encoder (motor) **Remedy:** Check whether the brake is opening Check motor data Check the motor connection (U-U, V-V, W-W) Increase the "SPD_KP" parameter in the "Controller" menu,	●	●
514	n > n_LOAD	**Cause:** Speed is above 110 % of the nominal speed V* **Remedy:** Check / increase the “SPD_KP” parameter in the “Controller” menu, Check the motor data in the “Motor name plate” menu	●	●
515	v > 110% V*	**Cause:** Speed is above 110% of the nominal speed V* **Remedy:** Check / increase the “SPD_KP” parameter in the “Controller” menu, Check the motor data in the “Motor name plate” menu	●	
516	v > 150% V*	**Cause:** Speed is above 150% of the nominal speed V* **Remedy:** Check / increase the “SPD_KP” parameter in the “Controller” menu, Check the motor data in the “Motor name plate” menu		●
520	Wrong direction	**Cause:** Drive moves several centimetres in the wrong direction **Remedy:** Check the motor connection (U-U, V-V, W-W) Check the settings in the “Motor name plate” menu Check rotary encoder connection Reduce the “SPD_KP” parameter in the “Controller” menu Increase the “M_MAX” parameter in the “Motor name plate” menu If the above solutions do not work successfully, replace the wires of the motor cable at connection terminal U and V. Important: In this case, rotary encoder adjustment must be carried out for synchronous drives (“Rotary encoder adjustment” menu, “ENC_ADJ” parameter)	●	●

Error no.	Error text	Error cause	M	S
525	ENC: ADC Limit	**Cause:** Signal track A, B, C or D of the absolute or sinus encoder has exceeded the permissible limit value during travel **Remedy:** Check whether a rectangular rotary encoder is connected when the “ENC type” set in the “Encoder & BC” menu is “TTL sine”. In this case, set the parameter correctly Check whether the ZAdyn supports the connected rotary encoder (see operating instructions, “Rotary encoder connection” chapter) Replace the rotary encoder	●	●
528	Quickstart? (UPS!) [Schnellstart? (USV!)]	**Cause:** Travel began with a quickstart even though the ZAdyn is being operated with emergency power via a UPS. Due to the limited power of the UPS, it is not possible to hold speed 0 in this operating mode. **Remedy:** Switch off the quickstart in the control		
529	Quickstart alarm	**Cause:** In the quick start function, the drive moves by more than 7 mm while the speed is set to 0 m/s **Remedy:** Check the motor data in the “Motor name plate” menu Reduce the “SPD_KP” parameter in the “Controller” menu Check the motor connection (U-U, V-V, W-W)	●	●
530	STO: remains	See error 348 “STO: Remains”.	●	
531	STO: Interruption	**Cause:** STO input signals were interrupted during travel. Interruption of the travel in case of signal interruption longer than 200 ms. No interruption of the travel in the event of shorter interruptions, but error entry at the end of travel **Remedy:** Check the safety circuit Check actuation of the STO inputs Check the relay supply voltage Check the control voltage of the STO signals	●	
532	STO: missing	**Error:** At the end of travel there is still a signal at the STO_A and STO_B inputs after 2,5 s. **Remedy:**Check actuation of the STO inputs Adjust the time during which the STO inputs are actuated on the elevator control		●
533	STO: Fault	**Cause:** The status of the STO_A and STO_B signals was different for longer than 120 ms **Remedy:**Check actuation of the STO inputs Check the switching function of the relay contacts Check coupling relay actuation	●	●
534	STO: No travel signal	See error 349 “STO:no travel signal”.		
535	ZR: RDY abort	**Cause:** ZArec error message - the signal at the digital input configured for “ZR_RDY” drops during travel **Remedy:** Use the ZArec display to check for an error on the ZArec For sporadic occurrence: Check EMC-compatible installation (screening, etc.)		●
536	SBC:RDY abort	**Cause:** The digital input with the “SBC_RDY” function is de-energized during travel or is not set at the start of travel **Remedy:** See “Error diagnosis” chapter in the operating instructions for the ZAsbc4		●
540	CO: ON!?	See error 337 “CO: Missing”.		●
544	CO/RF:Vx active	**Cause:** Interruption of the travel due to CO interruption, the travel commands from the control remain active **Remedy:** Check the safety circuit Check contactor actuation Check evaluation of the ZAdyn output signals by the control	●	
545	CO open early	**Cause:** Interruption of the travel due to CO interruption **Remedy:** Check the safety circuit Check contactor actuation	●	
548	CO1: still on	**Cause:** At the end of travel, the contactors are not yet detected as de-energized when the time “T_CDLY” in the “Monitoring” menu has elapsed **Remedy:** Check the wiring of the contactor monitoring Check contactor actuation Check the function of the contactors		●

Error no.	Error text	Error cause	M	S
550	MOT: Overload !	**Cause:** Motor current exceeds the value “I_MAX” for the time “T_MAX” in the “Monitoring” menu **Remedy:** Check the motor data in the “Motor name plate” menu Check the weight compensation Check the brake lifting Check the system design	●	●
552	Disc:EncInc deviance	**Cause:** The encoder line count determined has an excessive tolerance **Remedy:** Check the friction wheel (support, bearing, diameter) Switch the ZAdyn off and back on For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service	●	●
553	Disc:Wrong position	**Cause:** A magnet has been detected but is not expected **Remedy:** Check the position of the magnets Switch the ZAdyn off and back on	●	●
560	V > VZ	**Cause:** When travelling at a controlled speed V_Z (resetting), the speed was 10% higher than the specified setpoint speed **Remedy:** Check the parameters set in the “Motor name plate” menu Check the “SPD_KP” and “SPD_TI” parameters in the “Controller” menu Only active when entered in negative error screen.	●	●
565	Movement detected	**Cause:** The motor shaft moved during encoder adjustment with closed brake **Remedy:** Check whether the brake was disconnected before starting encoder adjustment. The brake must not be opened during adjustment	●	
570	PFU Alarm	**Cause:** The monitoring contact for the power recuperation unit (input “BC”) opens during operation of the ZAdyn or is not closed during start-up **Remedy:** Check the power recuperation unit error display. Check the connection of the alarm relay for the power recuperation unit	●	●
575	MOT: Temp. -Alarm	**Cause:** The motor temperature has exceeded the permissible limit value during travel **Remedy:** Check the parameters set in the “Motor name plate” menu In the “Mot” info menu, check the motor current for constant travel (empty cabin down). The displayed motor current should not exceed the nominal current of the motor. In asynchronous motors, if necessary perform automatic identification of the motor parameters (in the “Motor name plate” menu, “ASM_ID” parameter) Check the duty cycle of the motor (display in info menu “Power1”, value “ED”) In synchronous motors, check the rotary encoder offset Check the brake lifting Only active when entered in negative error screen.	●	●
582	BR:T2 too small	See error 346 “BR: T2 too small”.		
583	BR: Fault Travel	**Cause:** Brake monitoring has tripped during travel **Remedy:** Check correct function of the monitoring contacts Check brake actuation check the power supply of the brakes Only active when entered in negative error screen.	●	
584	BR: Fault Travel	**Cause:** Brake monitoring has tripped during travel a) For a brief interruption, entry at the end of travel b) For interruption longer than 500 ms, interruption of the travel **Remedy:** Check correct function of the monitoring contacts Check brake actuation check the power supply of the brakes	●	●
585	BR: T5 too small	**Cause:** The brake has not closed within the time “T_5” configured in the “Stop” menu **Remedy:** Check the brake triggering Check the dropout time of the brake magnet Check the setting for the “T_5” parameter and increase if necessary Check the switching function of the brake monitoring	●	●

Error no.	Error text	Error cause	M	S
587	BR: Delta t too small	**Cause:** Brakes do not engage with a time offset of min. 50 ms on emergency stop **Remedy:** Carry out brake control according to drive instructions Install free-running diode in a brake circuit Check existing free-running diode for faults	●	●
590	RV1/RV2:Change	**Cause:** The direction specification has been changed during travel **Remedy:** Check control of travel directions For sporadic occurrence: Check EMC-compatible installation (screening, etc.) Only active when entered in negative error screen.	●	●
599	Fan defective [Lüfter defekt]	**Cause:** The feedback signal for the main fan is no longer detected **Remedy:** Check the voltage supply (terminal L/N) for the fan Remove any blockages in the impeller Switch the ZAdyn off and on again (incl. voltage reset at terminal L/N) Contact ZIEHL-ABEGG Customer Service		●

3.6.10 Error 7xx - 8xx

- Trip abort due to errors between ZAdynpro and control system
- Errors which can occur in operation with CANopen Lift

If an error occurs during operation with CANopen Lift, 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
710	DCP: Timeout	**Cause:** DCP communication was interrupted during travel **Remedy:** Check the wiring of the DCP connection		●
715	DCP:G0-G7 missing	**Cause:** DCP telegram for setting the speed (G0-G7) is not sent by the control **Remedy:** Check compatibility of the control with the DCP specification	●	●
720	Extended in delay	**Cause:** During deceleration, the transferred remaining distance (DCP04) has been increased or a new target position (CAN) has been specified **Remedy:** Check the absolute encoder for determination of the remaining distance Check compatibility of the control with the DCP specification In the Bus Info 3 info menu, check the ratio of the distance measurement on the absolute encoder (shaft) to the motor encoder (line 4)	●	●
721	DCP:Remaining distance error”	**Cause:** The remaining distance specification does not change during travel **Remedy:** Check compatibility of the control with the DCP specification Check the absolute encoder for determination of the remaining distance	●	●
780	Quickstart > 20s	**Cause:** At the start of travel with the quickstart function, the travelling speed “V=0” is actuated for longer than 20s **Remedy:** Shorten the time in which "V=0" is triggered	●	●
781	Quick. during travel	**Cause:** The signal at the digital input configured for “V=0” is activated during travel **Remedy:** Check the triggering of "V=0"	●	●
799	RF: Interruption	**Cause:** The signal at the digital input configured for the “RF” controller enable function has been switched off during travel **Remedy:** Check the triggering of "RF" Check the safety circuit Only active when entered in negative error screen.	●	
800	CAN: Timeout	**Cause:** Error in Velocity mode: Heartbeat from the control missing or not received at the set intervals Error in the Position mode: Heartbeat from the control and/or rotary encoder missing or is not received at the set intervals **Remedy:** Check CAN connections Check that the heartbeat for the corresponding devices is set correctly		●

Error no.	Error text	Error cause	M	S
820	CAN: Illegal State	**Cause:** The control is sending CAN control words at an impermissible time or in the wrong sequence **Remedy:**Check that the control has the latest software version	●	●
821	CAN: Position Error	**Cause:** During travel at a speed greater than 10 cm/s the shaft position does not change within 200 ms (CAN Position mode) **Remedy:** Check the CAN absolute encoder in the shaft Check the traction conditions of the drive (traction sheave) If the error occurs 5 times in a row, the ZAdyn is locked. The lock can be released by parameter **Monitoring/UNLOCK=ON**.	●	●
831	CAN:Timeout Dis. Op.	**Cause:** The control does not issue the “Disable Operation” command within the time “T_CMD” entered in the “CAN” menu when stopping **Remedy:** Check the time for “T_CMD” Check compatibility of the control with the CAN specification CiA-417 Check the fault counter for changes during travel in the “Bus Info 4” info menu For sporadic occurrence: Check EMC-compatible installation (screening, etc.), termination of CAN bus (terminating resistors)		●
832	CAN:Timeout Shutdown	**Cause:** The control does not issue the “Shutdown” command within the time “T_CMD” entered in the “CAN” menu when stopping **Remedy:** Check the time for “T_CMD” Check compatibility of the control with the CAN specification CiA-417 Check the fault counter for changes during travel in the “Bus Info 4” info menu For sporadic occurrence: Check EMC-compatible installation (screening, etc.), termination of CAN bus (terminating resistors)		●
833	CAN:Timeout Dis.Vol.	**Cause:** The control does not issue the “Disable Voltage” command within the time “T_CMD” entered in the “CAN” menu when stopping **Remedy:** Check the time for “T_CMD” Check compatibility of the control with the CAN specification CiA-417 Check the fault counter for changes during travel in the “Bus Info 4” info menu For sporadic occurrence: Check EMC-compatible installation (screening, etc.), termination of CAN bus (terminating resistors)		●
840	CAN:Enc.Info missing	**Cause:** The “Position conversion” object (0x641F) has not been written to the frequency converter by the control **Remedy:**Check that the control has the latest software version		●

3.6.11 Error 9xx

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

Error no.	Error text	Error cause	M	S
903	SIO not synchr	**Cause:** When the frequency converter is switched on, internal communication between the processors is faulty, the device performs a reset and restarts **Remedy:** Update the ZAdyn software For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service	●	●
905	MOP:HW-SW Error	**Cause:** Hardware or software error occurred after switch-on. The frequency converter switches to the “Wait-Switch off” state after 60s and must be switched off **Remedy:** Switch the ZAdyn off and back on For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service	●	●
906	ZR: ERR by start	**Cause:** If the “BC-TYP” parameter in the “Encoder & BC” menu is set to “ZArec”, “PFU”, or “PFU+BRxx”: There is no signal at the “BC” input when the ZAdyn is switched on **Remedy:** Check wiring Use the energetic recovery system display to check whether it has an error Check the setting of the “BC-TYP” parameter Switch the ZAdyn off and back on	●	●

Error no.	Error text	Error cause	M	S
907	PFU: BR alarm	**Cause:** At the digital input programmed with the “PFU_BR” function, in the 2nd parameter set the signal for temperature monitoring of the brake resistor drops out during travel **Remedy:** Check the brake resistor for overheating Check the wiring of the thermal contact on the BR Switch the ZAdyn off and back on		●
908	PFU: ERR at start	**Cause:** When switching on the frequency inverter, the monitoring contact for the power recuperation unit is not closed **Remedy:** Check the power recuperation unit for fault-free operation Check field of rotation of the mains connection for the power feedback unit Check the power recuperation unit function monitoring connection at the digital input “BC” Switch the ZAdyn off and back on		●
909	PFU Alarm	See error 570 “PFU: Alarm”.		
910	BC/BR: ERR at start	**Cause:** When switching on the frequency inverter, the monitoring contact for the brake chopper or brake resistor is not closed **Remedy:** Check the connection and function of the temperature monitoring for the brake chopper or brake resistor Make sure that a voltage of 24VDC is applied at the X-IN connection terminal between +24V_IN and GND_IN (see “Brake resistor” and “Digital inputs (X-IN)” chapters in the manual) Check the “BR_TYP” parameter in the “Encoder & BC” menu Switch the ZAdyn off and back on		
911	BRxx: Overload	**Cause:** The braking performance of the brake resistor reaches 200 % of the set power within the last 120s; the travel is aborted **Remedy:** Check the “BR_TYP” parameter in the “Encoder & BC” menu When selecting the “BRxx” setting, check the set power in the “P_BR” parameter Check the brake resistor design Switch the ZAdyn off and back on	●	
912	BC:Alarm/fault	**Cause:** The monitoring contact for the brake chopper or brake resistor opens during travel **Remedy:** Check the connection and function of the temperature monitoring Check the brake resistor design Switch the ZAdyn off and back on		
913	DC: U_DC>U_BC	**Cause:** When stopped, the internal measured voltage at the DC-link is higher than the engagement voltage of the brake chopper **Remedy:** Compare the displayed value “U_DC” in the “Brake Chopper” info menu with the measured value at the DC+ and DC- terminals (measuring range 1000 VDC, ATTENTION: High voltage). If the voltage displayed deviates by more than 5%, there is a defect in the device. If the measured voltage is greater than 620V, the line voltage is not compliant with the standards Check the supply voltage between the supply phases, max. value = 440 VAC The synchronous motor is moved away when stopped Switch the ZAdyn off and back on	●	●
914	Rotary encoder missing	**Cause:** No rotary encoder is detected when the ZAdyn is switched on **Remedy:** Check the rotary encoder connection Check the “ENC_TYP” parameter in the “Encoder & BC” menu for further information, see the “Rotary encoder” info menu Switch the ZAdyn off and back on		
915		**Cause:** No rotary encoder is detected at XENC-15 when switching on the frequency inverter **Remedy:** Check rotary encoder connection Reset frequency inverter	●	

Error no.	Error text	Error cause	M	S
917	BRxx activ	**Cause:** The internal transistor for the brake resistor is still activated 5.5 s after the end of travel **Remedy:** Compare the displayed value “U_DC” in the “Brake Chopper” info menu with the measured value at the DC+ and DC- terminals (measuring range 1000 VDC, ATTENTION: High voltage). If the voltage displayed deviates by more than 5%, there is a defect in the device. If the measured voltage is greater than 620V, the line voltage is not compliant with the standards Check the supply voltage between the supply phases, max. value = 440 VAC - Synchronous motor is moved away when stopped Switch the ZAdyn off and back on		●
919	ZR: BC error	**Cause:** ZArec error message - No signal at the digital input “BC” **Remedy:** Use the ZArec display to check for an error on the ZArec Switch the ZAdyn off and back on		●
920	Overcurrent standstill.	**Cause:** Overcurrent at standstill **Remedy:** Check the wiring of the brake chopper (if fitted) Check EMC-compatible installation (screening, etc.) For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service		
931	Internal error	**Cause:** Internal device error **Remedy:** Switch the ZAdyn off and back on For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service		●
935	MP: PWM on	**Cause:** Internal device error **Remedy:**For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service		●
950	TD_CNT: Limit	**Cause:** The maximum number of changes of direction has been reached **Remedy:** Replace the suspension means and reset the counter One journey is possible after switching the ZAdyn off and back on		●
960	STO: Diagnostic	**Cause:** The status of the STO_A and STO_B signals was different for longer than 310 ms. The ZAdyn is the locked by internal hardware diagnostics **Remedy:**Check actuation of the STO inputs Error can only be reset once the ZAdynpro is switched off		●
961	STO: Hardware	**Cause:** Hardware error in the STO diagnostics **Remedy:** Please contact ZIEHL-ABEGG Customer Service	●	●
962	STO: HW standstill [STO: HW Stillstand]	**Cause:** The internal diagnostic unit has detected an incorrect signal state. **Remedy:** Switch the ZAdyn off and back on Contact ZIEHL-ABEGG Customer Service		●
963	STO: Hardware start	**Cause:** The internal diagnostic unit has detected an incorrect signal state. **Adjustment:** Switch the ZAdyn off and back on Contact ZIEHL-ABEGG Customer Service		●
964	STO: Hardware stop	**Cause:** The internal diagnostic unit has detected an incorrect signal state. **Adjustment:** Switch the ZAdyn off and back on Contact ZIEHL-ABEGG Customer Service		●
970	DC: U < UDC_MIN	**Cause:** The DC-link voltage has fallen below the limit value for the minimum voltage during travel **Remedy:** There is a power failure during travel, check the voltage of the 3 phases of the power supply Check the “UDC_MIN” parameter in the “Power unit” menu (factory setting: 450 V) Check the mains connection (line voltage, cable cross-section, line reactor design, mains impedance)		●
972	Failure of a phase	**Cause:** A phase failure occurs during motorised travel and a reset is triggered. No error is generated during regenerative travel **Remedy:** Check the 3 phases of the supply voltage (measure L1, L2, L3 to PE)		●

Error no.	Error text	Error cause	M	S
975	DC: U > 850V	**Cause:** The DC-link voltage rises to more than 850 VDC during travel or when stopped **Remedy:** Check the “A_NEG” parameter in the “Deceleration” menu and reduce if necessary Check the connection and function of the brake chopper / brake resistor In the “Encoder & BC” menu, check the “BC_TYP” parameter Compare the displayed value “U_DC” in the “Brake Chopper” info menu with the measured value at the DC+ and DC- terminals (measuring range 1000 VDC, ATTENTION: High voltage). If the voltage displayed varies by more than 5%, there is a defect on the device. If the measured voltage is higher than 620 V, the line voltage is not compliance with the standards Switch the ZAdyn off and back on Check the size of the Brake-Chopper / Brake-Resistor,		●
976	STO: Temp. alarm	**Cause:** The temperature in the area of the STO safety circuit exceeds 75 degrees Celsius **Remedy:** Check the function of the unit fans Ensure an ambient temperature of less than 55 degrees Celsius Switch the ZAdyn off and back on		●
980	SW error (zm)	**Cause:** Internal error, unknown state **Remedy:** Switch the ZAdyn off and back on Perform a software update For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service		●
981	SW error (zm cc)	**Cause:** Internal error, unknown travel curve computer state **Remedy:** The error can only be reset by switching off the ZAdyn Perform a software update For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service		●
982	SW error (T>4.5ms)	**Cause:** Internal device error, maximum cycle time for internal calculations almost reached **Remedy:** Perform a software update For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service		●
990	SW error (Stacktop)	**Cause:** Internal ZAdyn error **Remedy:** Perform a software update For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service		●
991	SIO: Timeout	**Cause:** Communication between the motor management processor (MOP) and the application processor (APP) interrupted **Remedy:** Check EMC-compatible installation (screening, etc.) For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service		●
994	MOP: Timeout 2	**Cause:** Communication between the motor management processor (MOP) and the application processor (APP) is interrupted when stopped **Remedy:**For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service For sporadic occurrence: Check EMC-compatible installation (screening, etc.)		●
997	SW error (MOP)	**Cause:Cause:** Internal motor management processor (MOP) error **Remedy:** Perform a software update For persistent occurrence: Please contact ZIEHL-ABEGG Customer Service		●

3.6.12 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 stopping process motor contactors are opened, before the timer T_5b has expired. The number of CO interruptions is counted in the **Statistic/SCO** menu.
RF-Interrupt	The controller enable (signal CE) is deactivated during travel. During the stopping process the controller enable (signal CE) is deactivated before the timer T_5b has expired. The number of CE interruptions is counted in the **Statistic/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 nameplate.
automatic pre-signment?	After changing the parameter V*, you can confirm the request " automatic pre-signment?" with yes or no.
Change suspension means! [Wechsel Tragmittel!] Remaining change in direction of travel: xxx	The suspension means used must be replaced within approx. 1 year at the latest. The remaining number of changes of direction with the current suspension means is displayed and continuously refreshed. The calculation is based on evaluation of system utilisation in the past. Any change in the utilisation after the information is output is not taken into account. The text must be confirmed with the ESC key, otherwise the message will remain in the display.

3.7 Operation conditions of the ZAdynpro

The software of the ZAdynpro divides the travel curve into multiple ranges. Each of these ranges is allocated a status number, which relates to a certain operating state.
If an error occurs, the status number is stored with the error number in ther error list.
Furthermore, the operating statuses are displayed with the status number and in plain test in the **Info/Page02** menu.

status	Condition of the frequency inverter	status	Condition of the frequency inverter
10	Checking of voltage supply	420, 430	Constant running at speed Vx
21	Check software version	440, 480	Deceleration to speed 0m/s
22	Parameter transmission	460	Deceleration to speed Vx
23	Waiting for signal processor, power unit detection	490	Emergency stop: Deceleration at max. acceleration
30	Check absolute value encoder	493	Mode with travel curve computer switched off
35	Evacuation monitor	495	Travel curve computer end
40	Activation of DC-link voltage	500	Keep motor at speed 0 (T4)
41 42	Check input BC 41: Power feedback unit 42: Brake chopper or brake resistor	510	Wait until the motor brakes are closed (T_5)
50,55	Adjust current transformer	515	Brake is energised for 1 s longer
70	Check temperature power unit	520	S Switch off current supply to motor (T_5b)
80	Start fan	530	Wait until motor contactors switched off
90	Electronic short-circuit active	535	Travel interrupted due to interruption of the controller enable RF
91	Electronic short-circuit deactivated	536	Travel interrupted due to interruption of the contactor monitor COx
93	Standby 1	538	Wait until STO activates
96	Parameter calculation active	540	Wait for standstill
97	Editing parameter	560	End of travel

status	Condition of the frequency inverter	status	Condition of the frequency inverter
98	Waiting for ZArec	570, 572, 575, 902, 904	Recording to MMC
99	Waiting for rotary encoder	900	Delay of automatic acknowledgement after remedying the cause of the fault (2 s)
100	Device off	907	Checking for overcurrent
105	Power feedback unit on standby	908	Deceleration after overcurrent
107, 108	Modifying the clock frequency	909	Waiting for travel command off
110	Machine ready	910	ZAdyn locked
115	Start delay	920	Read absolute value error
200	Start-up check	930	Power unit overtemperature
210 ... 223	Check absolute value encoder	932	Motor overtemperature
280	Wait until STO deactivates	940, 942	Read hardware error
300	Wait until motor contactors switched on	950	Parameter change
305	Checking the motor phases	960	Read absolute value error
310 311	A Build-up of magnetic field in the motor (T1)	980	Switch off DC-link
315, 316	Checking absolute value	982	Motor type changed
319	Start control	988	Wait for reset
320	Wait until motor brakes have opened (T2)	990	Fault input BC
325	Quickstart	993	Overcurrent at standstill
330	Accelerate motor to speed V_T3 (T3)	995	Maximum change of direction reached
340	Commissioning	996	STO error
400	Travel curve computer data transmission	997	Frequency converter is in stand-by mode
410	Accelerate to speed Vx	998	Wait until ZAdynpro is switched off

3.8 Frequent startup problems

Problem	Cause	Remedial measures
ZAdynpro 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
ZAdynpro stops in status 40 during the start procedure, the error message relay of output O11-O14 does not pick up, the menu can 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 incorrect	Check settings in the **Motor rating plate** and **System data** menus (the value of the parameter **n*** in the **System data** menu may not be considerably larger than the value of the parameter **n** in the **Motor rating plate** menu)
	Motor data are not correct	

3.9 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 parameters
```


4 Memory card

4.1 General

Technical data memory card

Type:	SD, SDHC
Storage capacity:	max. 32 GB

The following functions are possible by using a memory card:

- Software update
- Saving a third operating language
- Parameter back-up
- Loading parameters
- Saving parameter lists, error lists and parameters
- Continuous recording of travel curves

Information
The LED of the ZAdynpro lights up in blue when the ZAdynpro is accessing the memory card.

4.2 Software update

Danger
Carry out a supervised inspection trip after completing the update!

CAUTION!

Danger
Destruction of software boot loader
If the power supply to the ZAdynpro is interrupted during the software update or the memory card is removed, this can destroy the software boot loader.
▷ Do not interrupt the ZAdynpro power supply or remove the memory card during the software update.

4.2.1 Software update with the ZApadpro control terminal

Information
A software update **cannot** be performed using the card slot on the ZApadpro! Do **not** insert the memory card into the card slot of the ZApadpro!

▷ Save the software on a memory card.
▷ Insert the memory card into card slot X-MMC.

1.	Select **Memory card** menu ↵ Confirming menu selection	Statistics ->Memory card MMC recorder Encoder alignment!
2.	Select parameter **UPDATE** ↵ Confirming menu selection Enter the update code[1)].	Memory card ↳ UPDATE 0 ↳ 27
3.	The update is performed and last a maximum 5 minutes.	please wait... max 30s
4.	A restart is performed after the update. The frequency inverter is ready for operation again. The display shown on the left appears.	ZIEHL-ABEGG AG ZAdynpro SN: 12345678 4.42 - 506

[1)]The update code can be created depending on the ZAdyn serial number and the firmware version under the following link: https://zacode4drives.ziehl-abegg.com/. Alternatively, it can be created using the ZAmon Mobile app.

4.2.2 Software update without ZApadpro control terminal

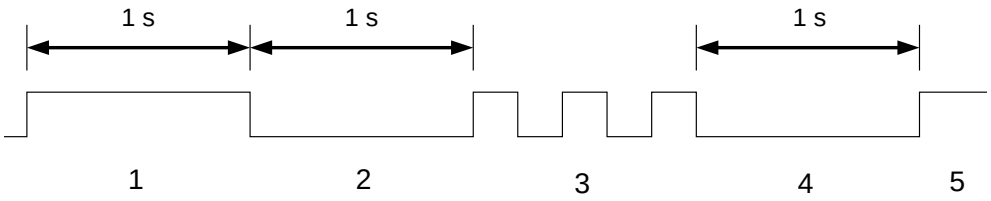
▷ Switch off the mains switch and wait until the controller unit is voltage free.
▷ Insert the memory card with the software update into the "X-MMC" card slot.
▷ Switch on the master switch. The inverter starts again.
▷ After the LED illuminates yellow for the first time, remove the memory card and then reinsert it. You must complete this procedure within 5s (watch for fast flash code of the LED).
✓ The Update starts (duration max. 30s).

Following another automatic reset, the ZAdynpro is once more ready for operation.

4.2.3 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
7	**Error:** Occurs if the ZAdynpro is restarted after error 25 has occurred. **Remedy:** Repeat the software update without the ZApadpro control terminal
8,14	Internal programing voltage does not switch off
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
25	Check sum of the update code incorrectly detected

4.3 Saving a third operating language

On the ZAdynpro, a memory card can be used to save a third operating language. If a new third operating language is saved, the existing third operating language is overwritten.

▷ Save the software of the ZAdynpro on a memory card.
▷ Insert the memory card into card slot X-MMC.

1.	Select **LCD & password** menu ↵ Confirming menu selection	ZAdynpro ->LCD & Password Motor name plate Encoder & BC
2.	Select parameter **LCD** ↵ Confirming menu selection Select operating language ↵ Confirm selection	LCD & password ↳LCD German ↳ Dutch Language
3.		Load language.....

4.4 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.

Parameter back-up

1.	Select **Memory card** menu ↵ Confirming menu selection	Statistics ->Memory card MMC recorder Encoder alignment!
2.	Select parameter **SAV_PAR** ↵ Confirming menu selection Select "SAV_PAR=EIN"	Memory card ↳SAV_PAR OFF ↳ ON
3.	Confirm with the ↵ key.	
4.	The parameters are saved.	Please wait ... Copy1:_ _ _ _ _ _ _

4.5 Loading parameters

Loading parameters which have been saved using the SAV_PAR function.

Loading parameters

1.	Select **Memory card** menu ↵ Confirming menu selection	Statistics ->Memory card MMC recorder Encoder alignment!
2.	Select parameter **LOD_PAR** ↵ Confirming menu selection Enter "LOD_PAR=27"	Memory card ↳ LOD_PAR 0 ↳ 27
3.	Confirm with the ↵ key.	
4.	The parameters are saved.	Please wait ... Copy1:_ _ _ _ _ _ _

4.6 Saving parameters lists, printer lists and error lists

Parameter lists, printer lists and error lists can be saved on the memory card with assignment of the ZAdynpro serial number. The following folder structure is created on the memory card: **"4CX\DEVICE\serial number"**.

Folder	Contents
"Serial number"	Folder "LST", folder "PAR"
"LST"	Error lists, printer lists
"PAR"	Parameter lists

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).

Saving parameters lists, printer lists and error lists

1.	Select **Memory card** menu ↵ Confirming menu selection	Statistics ->Memory card MMC recorder Encoder alignment!
2.	Select parameter **SAV_ALL** ↵ Confirming menu selection Select "SAV_ALL=EIN"	Memory card ↳ SAV_ALL OFF ↳ ON
3.	Confirm with the ↵ key.	
4.	The parameter list, the printer list and the error list are saved.	Copy1: _ _ _ _ _ _ _ _ _
5.	After the data backup the "SAV_ALL" parameter reassumes the value "OFF".	Memory card -> SAV_ALL Off [SAV_AL- [SAV_ALL Aus] SAV_PAR Off

4.7 Performing measurements

It is possible to perform measurements on the ZAdynpro. 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).

4.8 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

1.	Select **Memory card** menu ↵ Confirming menu selection	Statistics ->Memory card MMC recorder Encoder alignment!
2.	Select parameter **SAV_CFG** ↵ Confirming menu selection **Line 3:** Enter configuration number ("1" in this example)	Memory card ↳ SAV_CFG 0 ↳ 1
3.	Confirm with the ↵ key.	
4.	The parameter list and the printer list are saved.	Copy1: _ _ _ _ _ _ _ _ _
5.	After the data backup the **"Memory Card"** menu is displayed again.	Memory card UPDATE 0 -> SAV_CFG 0 LOD_CFG 0

4.9 Loading configurations

Saved configurations of parameters can be loaded from the memory card into the ZAdynpro by entering the respective configuration number.

Saving configurations

1.	Select **Memory card** menu ↵ Confirming menu selection	Statistics ->Memory card MMC recorder Encoder alignment!
2.	Select parameter **SAV_CFG** ↵ Confirming menu selection **Line 3:** Enter configuration number ("1" in this example)	Memory card ↳ LOD_CFG 0 ↳ 1
3.	Confirm with the ↵ key.	
4.	The parameter list and the printer list are loaded. The frequency inverter performs a reset after loading.	please wait...

5 Open loop operation (operation without encoder)

Features of open loop operation:

- Distance-dependent deceleration not possible
- Possible communication with elevator 'control:
  - Standard (digital inputs and outputs)
  - DCP1, DCP3
  - CANopenLift (Velocity Mode)
- Round speed profile journey not possible
- This may cause excessive heating of the motor
- Lower positioning accuracy than in closed loop operation
- Worse travel behaviour than in closed loop operation
- maximum travel speed: 1,0 m/s

5.1 Commissioning

<table>
<tr><td>Step 1</td><td>Change operator level in the Startup menu
• USR_LEV = Advanced</td></tr>
<tr><td>Step 2</td><td>Enter parameters in the Motor name plate menu

Motor type
• MOT_TYPE = ASM

Technical data
The values correspond to the specifications on the motor name plate
• n = Nominal speed [rpm]
• f = Frequency [Hz]
• p = Number of pole pairs (value is calculated; entry not possible)
• I = Nominal current [A]
• U = Nominal voltage [V]
• P = Nominal power [kW]
• Cos phi = Power factor
• TYP = Circuit type [Y/]</td></tr>
<tr><td>Step 3</td><td>Checking plausibility of n:
1. Calculation of the speed n_{syn} of the magnetic field in the motor winding.
n_{syn} = f x 60 / p

2. Comparison of nominal speed n with speed n_{syn}
Depending on the pole pairs (see parameter p in the Motor name plate menu), the following difference must result between n_{syn} and n:
<table>
<tr><th>Number of pole pairs (p)</th><th>Difference n_{syn} - n [rpm]</th></tr>
<tr><td>2</td><td>80 – 120</td></tr>
<tr><td>3</td><td>50 – 80</td></tr>
</table>
3. If the calculated difference is outside the range specified in the table, the nominal speed n must be calculated using the formula in the table below and entered in the Motor name plate menu
<table>
<tr><th>Number of pole pairs (p)</th><th>Calculation of nominal speed n [rpm]</th></tr>
<tr><td>2</td><td>n=n_{syn} - 100</td></tr>
<tr><td>3</td><td>n=n_{syn} - 65</td></tr>
</table></td></tr>
<tr><td>Step 4</td><td>Activate open loop operation in the Encoder & BC menu
• ENC_TYP = No ENC

Assignment of the parameter ENC_type to the No ENC function activates open loop operation.</td></tr>
</table>

Step 5	Enter parameters in menu **Installation**. • V* = System nominal speed [m/s] • MOD_n*= Calculation • n* = Motor speed at V* [rpm] (value is calculated, entry not possible) • _D = Traction sheave diameter [m] • __iS = suspension • __i1 = i1 of the gear ratio i1:i2 • __i2 = i2 of the gear ratio i1:i2
Step 6	Checking plausibility of n* The value determined for n* must be less than or equal to the nominal speed n in the **Motor name plate** menu. If n* > n, the parameter V* must be reduced in the System data menu until n* < n.
Step 7	Enter the parameters in the **Travel** menu. • V_3 = V* (nominal speed of the installation) In CANopen lift operation, this speed has to be configured in the control.
Step 8	Deactivate distance-dependent deceleration in the **Deceleration** menu • S_ABH = Off
Step 9	Perform travel at reduced speed (e.g. recovery control) **Requirements:** • Weight balancing must be correct • The speed must be min. 30 % of the nominal system speed Move **up** and **down** with an empty cabin. • Travel in both directions possible -> Continue with step 10 • Motor does not rotate and travel is aborted: -> Continue with “Open loop operation (operation without encoder))/Troubleshooting” chapter
Step 10	Perform travel at nominal system speed • Travel in both directions possible -> Start-up is complete, no further steps necessary • Travel is aborted: -> Continue with Troubleshooting

5.2 Troubleshooting

Problem	Cause/Remedy
Motor does not rotate and travel is aborted	• Travel is aborted with error: – 410 ADC:Overcurrent – 480 MP:Overcurrent – No ZAdyn error message (interruption of travel by control) -> In the **Control** menu configure the **UF_ED = Manual** parameter -> In the **Control** menu increase the **I_IxR** parameter in increments of 10 % until the motor rotates. Do not exceed the maximum value of 1.5 x nominal motor current.
No stopping accuracy despite correctly set switch-off points	• System travels too slowly during motor travel / stops before stop point -> In the **Motor name plate** menu reduce the **I** parameter by 10 % • System travels too fast/passes stop point on motor travel -> In the **Motor name plate** menu increase the **I** parameter by 10 % • System stays uneven as a function of load -> In the **INFO menu Page 03: Dist.** check the s1 display to see whether a positioning run is being carried out at speed V_1 Dist. ---------- 03 sa: 0.00 s21: 0.52m sr:^0.00 s31: 1.45m s1: 0.00 sd: 0.52m - Travel at V_1 is carried out, system stops before stop point -> In the **Travel** menu increase the **V_1** parameter by 10 % - Travel at V_1 is not carried out -> Check switch-off points
Error message during acceleration	• Acceleration cancelled with error: – 410 ADC:Overcurrent – 480 MP:Overcurrent -> In the **Accelerate menu** - Increase **R_POS1** parameter - Reduce **A_POS** parameter
Error message during deceleration	• Deceleration cancelled with error: – 410 ADC:Overcurrent – 480 MP:Overcurrent -> In the **Deceleration menu** - Increase **R_NEG1** parameter - Reduce **A_NEG** parameter

5.3 Parameters for open loop operation

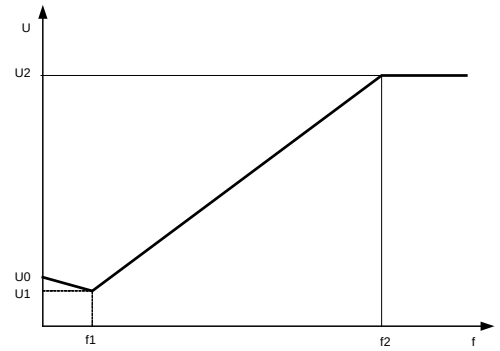
For open loop operation, additional parameters for optimising travel performance are available in the **Control** menu.
The parameters are visible only when open loop operation is active.
If it is necessary to change parameters, the parameter **Controller/UF_ED=Manual** must be entered.

Parameter	Designation	Value range	Factory setting
UF_ED	U/f-Edit-mode Enabling the additional parameters with Open-Loop-operation (U/f)	Auto Manual	Auto
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 frequence dependent voltage characteristic	0 ... 460 V	autom. preconfiguration
U1	Start voltage of the frequency dependent voltage characteristic	0 ... 460 V	autom. preconfiguration
U2	Corner voltage of the frequency dependent voltage characteristic	0 ... 460 V	autom. preconfiguration
f1	Start frequency of the frequency dependent voltage characteristic	0 ... 125 Hz	autom. preconfiguration
f2	Corner frequency of the frequency dependent voltage characteristic	0 ... 125 Hz	autom. preconfiguration
s_FIL	Filter for measuring motor current for the slip compensation	0 ... 400 ms	autom. preconfiguration
s_COMP	Operation with slip-compensation **On:**Slip-compensation is activated **Off:**Slip-compensation is deactivated	On Off	On
s_LIM	Maximum slip frequency compensation		autom. preconfiguration
U_S_MX	Maximum output voltage for the slip compensation	0 ... 300 V	80
I_IxR	Current controller, sets the minumm current with wihich the motor is energised	0 ... 90 A	Nominal current (I) of the motor
I_FIL	Filter of the motor current for the slip-compensation	0 ... 125 Hz	autom. preconfiguration
IxR_KP	P-contribution of the controller for the current	0 ... 10 V/A	autom. preconfiguration
IxR_TI	I-contribution of the controller for the current	5 ... 1000 ms	20 ms
IxR_KC	Correction factor of the controller for the current	0 ... 127	0.2
IxR_KD	D-contribution of the controller for the current	0 ... 3.0	0.0
IxR_MX	Maximum limitation of the controller	0 ... 100%	20
IxR_MN	Minimum limitation of the controller	0 ... 100%	0
FADE1	Fading-in and fading-out the current-control and the slip-compensation depending on the frequency of the rotating field in the stator	0 ... 125 Hz	autom. preconfiguration
FADE2	Fading-in and fading-out the current-control and the slip-compensation depending on the frequency of the rotating field in the stator	0 ... 125 Hz	autom. preconfiguration

5.4 Functions with Open-Loop-operation

5.4.1 U/f-characteristic curve

By entering the motor data in the **Motor rating plate** menu, the parameters **"U0", "U1", "U2", "f1"** and **"f2"** are pre-assigned. With these parameters, the U/f characteristic curve is defined that specifies the motor voltage dependent on the frequency of the rotary field in the stator.



U/f-characteristic curve

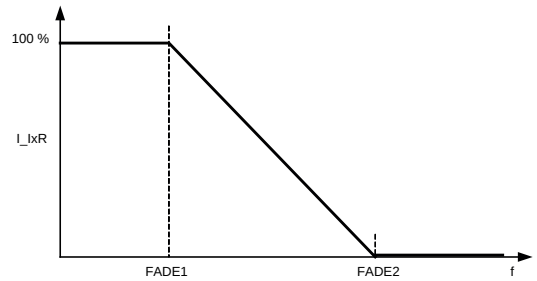
5.4.2 Current-control

To optimise starting, stopping and travelling at a low speed, the motor is energised with a minimum current (parameter **Control/I_IxR**). With the parameters **FADE1** and **FADE2**, the current supply is specified depending on the frequency (f) of the rotary 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

5.4.3 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**.

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

Functionality:
The motor current is recorded by a filter (parameter **s_FIL**). In proportion to the level of the measured current, the following occur:

- the slip-frequency will be added or subtracted to the output frequency of the U/f-characteristic curve
- voltage will be added dto the output voltage of the U/f-characteristic curve

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

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

Frequency: Parameter **s_LIM**

```
Controller
↳U_S_MX  80          V
  ↳      80
U/f: Max. output volt.
```

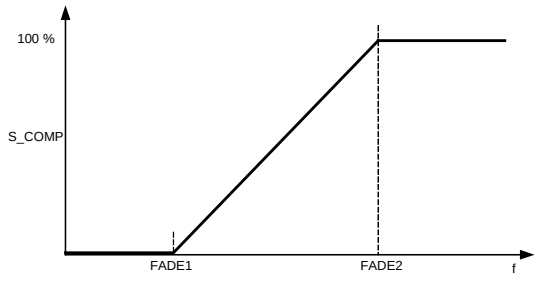
Voltage: Parameter **U_S_MX**

The slip-compensation is specified depending on the parameters **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.



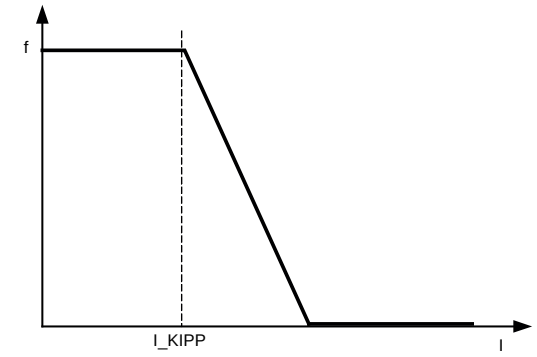
Fader-function with slip-compensation

5.4.4 Tilting protection

Avoids an uncontrolled tilting of the speed.

Functionality:

The motor current is recorded by a filter (parameter **s_FIL**).
If the limit value set for the current (parameter **I_KIPP**) is reached, the specified target value for the speed is reduced in line with the motor current.



Tilting protection

5.5 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".

5.5.1 Optimizing start up behavior

If the motor turns back when starting up, does not start or an overcurrent occurs immediately after opening the mechanical brake, the minimum current that is fed to the motor is too low. In this case, the **Control / I_IxR** parameter can be increased to minimise travel.

```
Controller
↳► I_IxR   15          A
  ↳►       18
```

5.5.2 Slip-compensation

Due to the different speeds in upwards and downwards direction the different positioning travels or inexactness during the stopping can occur. By having nearly the same speed in both directions these inaccuracies can be minimised. The adjustment of the speed is carried out by the slip-compensation.

The slip-compensation will be activated with the parameter **Controller/s_COMP=On**.

```
Controller
↳► s_COMP  On
  ↳►       On
U/f: Slip compensation
```

6 Energy saving

6.1 Standby function ZAdynpro

- To save energy at a standstill, the ZAdynpro can be switched to standby mode.
- In standby mode, the ZAdynpro is completely switched off.

Power loss in standby

	ZAdynpro 011-017	ZAdynpro 023-032
Heat dissipation	≤ 3.0 W	≤ 6.0 W

☞For activation of standby mode, see chapter "Electrical installation/Standby input (X-SBY)" in part 1 of the operating instructions.

7 Parameter list

Information
Not all the described parameters are freely accessible and visible. The display depends on the selected functions and settings in the ZAdynpro.

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

7.1 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.

7.1.1 Startup menu

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

Parameter	Designation	Value range	Factory setting
LANG	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. To do this, the language files must be stored on the memory card in the following folder: 4CX\Update\0_TEXT	Deutsch English Türkce Nederland Espanol Italiano Svenska Cesky Francais Polski Russki	Deutsch
USR_LEV	User Level Selection via the user level which is available in the ZAdynprowhen starting the ZApadpro.	Basic Advanced	Basic

Parameter	Designation	Value range	Factory setting
MOT_TYP	Enter the operated motor type A **ASM:**Asynchronous motor S **SMxxx:** Synchronous motor, third-party product **SM132.xx-14:** ZIEHL-ABEGG synchronous motor type SM132 **SM160.xx-20:** ZIEHL-ABEGG synchronous motor type SM160 **SM180.xx-14:** ZIEHL-ABEGG synchronous motor type SM180 **SM190.xx-20:** ZIEHL-ABEGG synchronous motor type SM190 **SM200.xx-20:** ZIEHL-ABEGG synchronous motor type SM200 **SM210.xx-20:** ZIEHL-ABEGG synchronous motor type SM210 **SM225.xx-20:** ZIEHL-ABEGG synchronous motor type SM225 **SM250.xx-20:** ZIEHL-ABEGG synchronous motor type SM250 **SM315.xx-30:** ZIEHL-ABEGG synchronous motor type SM315 **SM700.xx-30:** ZIEHL-ABEGG synchronous motor type SM700 **SM860.xx-30:** ZIEHL-ABEGG synchronous motor type SM860 **SL506.xx-30:** ZIEHL-ABEGG synchronous motor type SL506 **SL510.xx-28:** ZIEHL-ABEGG synchronous motor type SL510 **BD132.xx-14:** ZIEHL-ABEGG synchronous motor type BD132 **SM500.xx-24:** ZIEHL-ABEGG synchronous motor type SM500	ASM SMxxx SM132.xx-14 SM160.xx-20 SM180.xx-14 SM190.xx-20 SM200.xx-20 SM210.xx-20 SM225.xx-20 SM250.xx-20 SM315.xx-30 SM700.xx-30 SM860.xx-30 SL506.xx-30 SL510.xx-28 BD132.xx-14 SM500.xx-24	SM225.xx-20
n	Enter the motor's rated speed	0.1 ... 6000 rpm	Depends on configured motor type
f	Enter the motor's rated frequency	0.1 ... 200 Hz	
I	Enter the motor's rated current	0.1 ... 363 A	
U	Enter the motor's rated voltage Enter the motor's rated current	0.1 ... 460 V	
P	Enter the motor's rated power	0.1 ... 110 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 Triangle	Star
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 **BiSS-C:** Absolute value encoder with BiSS-C interface 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 operation	EnDat/SSI HTL 10-30V TTL rect. TTL Sine Hiperface Codeface ERN1387 No ENC. BiSS-C	Depends on configured motor type
ENC_INC	Enter encoder resolution (pulses/revolution)	64 ... 11000	

Parameter	Designation	Value range	Factory setting
BC_TYP	Enter the used brake resistor or brake chopper **BR11:** Brake resistor type BR11-A **BR50:**Brake resistor type BR50 **BR50+BR25:** parallel connection of BR25 and BR50 **BR50+BR50:** parallel connection of 2 pieces BR50 **BRxx:** Brake resistor external product **PFU:** Power Feedback Unit **PFU+BR11:** Power Feedback Unit + Brake resitor type BR11 **PFU+BR11:** Power Feedback Unit + Brake resitor type BR17 **PFU+BR11:** Power Feedback Unit + Brake resitor type BR25 **PFU+BR11:** Power Feedback Unit + Brake resitor type BR50 **BR09-1:** Brake-Resistor Type BR09-1 **BR14:** Brake resistor type BR14 **BR100:** Brake resistor type BR100 **PFU+BRxx:** Power Feedback Unit + Brake resitor external product **2*BR100:** parallel connection of 2 pieces BR100 **3* BR100:** Parallel circuit of three 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 feedback unit **4*BR4:** parallel connection of 4 pieces BR100	BR11 BR50 BR50+BR25 BR50+BR50 BRxx PFU PFU+BR11 PFU+BR17 PFU+BR25 PFU+BR50 BR09-1 BR14 BR100 PFU+BRxx 2* BR100 3* BR100 BR17 BR25 BC25 BC50 BC100 ZArec 4*BR100	BR17
V*	Enter the installation rated speed	0.00 ... 10.00 m/s	1.00
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	0.1 ... 6000 rpm	A 1358.1 S 60.6
__D	Enter the diameter of the traction sheave	0.06 ... 1.50 m	A 0.45 S 0.315
__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	Entry of **i1** gearbox ratio **i1:i2**	1 ... 650	1
__i2	Input of **i2** of the gearbox ratio **i1:i2**	1 ... 1000	32
Q	Enter the elevator installation's rated load	100 to 32000	600

Parameter	Designation	Value range	Factory setting
CONFIG	Configuration of the digital inputs according to the used control system and type of communication **00:Free:** Outputs are freely configurable **01:ZA_IO:** Ziehl-Abegg standard actuation **02:ZA_CAN:** Ziehl-Abegg CAN **03:BP_IO:** Böhnke+Partner standard control **04:BP_DCP1:** Böhnke & Partner DCP1 **05:BP_DCP2:** Böhnke & Partner DCP2 **06:BP_DCP3:** Böhnke & Partner DCP3 **07:BP_DCP4:** Böhnke & Partner DCP4 **08:KN_IO:** Kollmorgen standard control **09:KN_DCP3:**Kollmorgen DCP3 **10:KN_DCP4:** Kollmorgen DCP4 **11:NL_IO:** New Lift standard control **12:NL_DCP3:** New Lift DCP3 **13:SS_IO:** Schneider Steuerungen standard control **14:SS_DCP3:** Schneider controls DCP3 **15:ZA_BIN:** Ziehl-Abegg standard actuation with binary speed specification **16:WL_IO:** Weber Lifttechnik standard control **17:WL_DCP1**: Weber Lifttechnik DCP1 **18:WL_DCP2**: Weber Lifttechnik DCP2 **19:WL_DCP3:** Weber Lifttechnik DCP3 **20:WL_DCP4:** Weber Lifttechnik DCP4 **21:ST_IO:** Strack Lift Automation standard control **22:ST_DCP3**: Strack Lift Automation DCP3 **23:ST_DCP4:** Strack Lift Automation DCP4 **24:CSILVA:** Carlos Silva standard control **25:X-BIN:** Free binary assignment **26:KW_DCP3:** KW Aufzugstechnik DCP3 **27: MAS_BIN:** Masora standard control **28: BU_SATU:** Hydraulic elevator aggregate with Bucher-Aggregat type Saturn ALPHA **29: BU_ORIO:** Hydraulic elevator aggregate with Bucher-Aggregat type Orion ALPHA **30: KS_IO:** Georg Kühn Control systems standard control **31: KL_IO:** Kleemann standard control **32: S_SMART:** Schindler Smart standard control **33: SS_DCP4:** Schneider controls DCP4 **34: OS_DCP3:** Osma DCP3 **35: Lester:** Lester Controls **36: HY-Mod.:** Hydraulic elevator with DCP4 **37: NL_DCP4:** New Lift DCP4	00:Free 01:ZA_IO 02:ZA_CAN 03:BP_IO 04:BP_DCP1 05:BP_DCP2 06:BP_DCP3 07:BP_DCP4 08:KN_IO 09:KN_DCP3 10:KN_DCP4 11:NL_IO 12:NL_DCP3 13:SS_IO 14:SS_DCP3 15:ZA_BIN 16:WL_IO 17:WL_DCP1 18:WL_DCP2 19:WL_DCP3 20:WL_DCP4 21:ST_IO 22:ST_DCP3 23:ST_DCP4 24:CSILVA 25:X-BIN 26:KW_DCP3 27:MAS_BIN 28:Bucher_SATU 29:Bucher_ORIO 30:KS_IO 31:KL_IO 32:S_SMART 33:SS_DCP4 34:OS_DCP3 35:Lester 36:HY-Mod. 37:NL_DCP4	01:ZA_IO
MO_DR	Changing the rotating direction of the motor It must be observed that with triggering the input RV1 the cabin drives upwards **left:** Rotary direction left **Right:** Clockwise rotation	left right	left

Parameter	Designation	Value range	Factory setting
BR	Motor brake monitoring Input of number and function of the brake monitoring contacts used **OFF:** No brake monitoring connected **1*NC:** 1x normally closed contact (Contact closed when brake currentless) **2x NC:** 2x Normally closed contact (contact closed when brake is currentless) **3x NC:** 3x Normally closed contact (contact closed when brake is currentless) **1*NO:** 1 x normally open (contact is open when brake currentless) **2x NO:** 2x Normally open contact (contact open when brake is currentless) **3x NO:** 3x Normally open contact (contact open when brake is currentless) **4*NC:** 4 x normally closed contact (Contact closed when brake currentless) **4*NO:** 4 x normally open (contact is open when brake currentless) **1xNC+1xNO:** 1x NC contact (BR1) and 1x NO contact (BR2)	Off 1*NC 2*NC 3*NC 1*NO 2*NO 3*NO 4*NC 4*NO 1*NC+1*NO	accordingly to motor type
P1P2	Motor temperature monitoring **OFF:** Temperature monitoring deactivated **PTC:** thermistor (PTC according to DIN 44082) **TC:** Thermal circuit breaker **KTY:** Temperature sensor KTY84-130 **Pt100:** Temperature sensor Pt100 **Pt1000:** Temperature sensor Pt1000	Off PTC TC KTY Pt100 Pt1000	PTC
K_START	Start gain Multiplication factor for the parameter "Controller/SPD_KP" or amplification of the position controller (dependent on the start-up mode)	is automatically limited	1.0
SPD_KP	Multiplication factor to modify the calculated basic amplification SPD_C	is automatically limited	1.0
NF	Noise Filter This parameter activates a noise filter that enables noise caused by the motor to be reduced.	Off On	Off
NF_F1	Filter-Freq.1: Number of slots Enter the number of slots on a synchronous motor.	0...1018	0

7.2 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.

7.2.1 LCD & Password menu

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

Parameter	Designation	Value range	Factory setting
LANG	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. To do this, the language files must be stored on the memory card in the following folder: 4CX\Update\0_TEXT	Deutsch English Türkce Nederland Espanol Italiano Svenska Cesky Francais Polski Russki	Deutsch
USR_LEV	User Level Selection via the user level which is available in the ZAdynpro when starting the ZAdynpro.	Basic Advanced	Basic
PASSWD	Enter password.	0 ... 9999	0
PW_NEW	New password A number between 0 and 9999 can be used as a password 0 = no password	0 ... 9999	0
PW_COD	Displays the password in coded form. If you lose the password, please contact the manufacturer.	Cannot be set	21689

7.3 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	Designation	Value range	Factory setting
MOT_TYP	Enter the operated motor type A **ASM:**Asynchronous motor S **SMxxx:** Synchronous motor, third-party product **SM132.xx-14:** ZIEHL-ABEGG synchronous motor type SM132 **SM160.xx-20:** ZIEHL-ABEGG synchronous motor type SM160 **SM180.xx-14:** ZIEHL-ABEGG synchronous motor type SM180 **SM190.xx-20:** ZIEHL-ABEGG synchronous motor type SM190 **SM200.xx-20:** ZIEHL-ABEGG synchronous motor type SM200 **SM210.xx-20:** ZIEHL-ABEGG synchronous motor type SM210 **SM225.xx-20:** ZIEHL-ABEGG synchronous motor type SM225 **SM250.xx-20:** ZIEHL-ABEGG synchronous motor type SM250 **SM315.xx-30:** ZIEHL-ABEGG synchronous motor type SM315 **SM700.xx-30:** ZIEHL-ABEGG synchronous motor type SM700 **SM860.xx-30:** ZIEHL-ABEGG synchronous motor type SM860 **SL506.xx-30:** ZIEHL-ABEGG synchronous motor type SL506 **SL510.xx-28:** ZIEHL-ABEGG synchronous motor type SL510 **BD132.xx-14:** ZIEHL-ABEGG synchronous motor type BD132 **SM500.xx-24:** ZIEHL-ABEGG synchronous motor type SM500	ASM SMxxx SM132.xx-14 SM160.xx-20 SM180.xx-14 SM190.xx-20 SM200.xx-20 SM210.xx-20 SM225.xx-20 SM250.xx-20 SM315.xx-30 SM700.xx-30 SM860.xx-30 SL506.xx-30 SL510.xx-28 BD132.xx-14 SM500.xx-24	SM225.xx-20
n	Enter the motor's rated speed	0.1 ... 6000 rpm	Depends on configured motor type
f	Enter the motor's rated frequency	0.1 ... 200 Hz	
p	Displays the number of pole pairs of the motor		
I	Enter the motor's rated current	0.1 ... 363 A	
U	Enter the motor's rated voltage	0.1 ... 460 V	
P	Enter the motor's rated power	0.1 ... 110 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 Triangle	Star
M_MAX	Maximum motor torque	0.2 ... 5.0	2.0

7.4 Encoder & BC menu

Enter:

- Rotary encoder type
- Rotary encoder resolution
- used Brake-Chopper or Brake resistor type

Parameter	Designation	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 **BiSS-C:** Absolute value encoder with BiSS-C interface A **TTL sine:** 5 V encoder with sine signal **TTL rect.:** 5 V encoder with rectangle signal **HTL 10-30 V:** 10-30 V encoder with square-wave signal **No ENC**: Open loop operation	EnDat/SSI HTL 10-30V TTL rect. TTL Sine Hiperface Codeface ERN1387 No ENC. BiSS-C	EnDat/SSI
ENC_INC	Enter encoder resolution (pulses/revolution)	64 ... 11000	2048
BC_TYP	Enter the used brake resistor or brake chopper **BR11:** Brake resistor type BR11-A **BR50:**Brake resistor type BR50 **BR50+BR25:** parallel connection of BR25 and BR50 **BR50+BR50:** parallel connection of 2 pieces BR50 **BRxx:** Brake resistor external product **PFU:** Power Feedback Unit **PFU+BR11:** Power Feedback Unit + Brake resitor type BR11 **PFU+BR11:** Power Feedback Unit + Brake resitor type BR17 **PFU+BR11:** Power Feedback Unit + Brake resitor type BR25 **PFU+BR11:** Power Feedback Unit + Brake resitor type BR50 **BR09-1:** Brake-Resistor Type BR09-1 **BR14:** Brake resistor type BR14 **BR100:** Brake resistor type BR100 **PFU+BRxx:** Power Feedback Unit + Brake resitor external product **2*BR100:** parallel connection of 2 pieces BR100 **3* BR100:** Parallel circuit of three 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 feedback unit **4*BR4:** parallel connection of 4 pieces BR100	BR11 BR50 BR50+BR25 BR50+BR50 BRxx PFU PFU+BR11 PFU+BR17 PFU+BR25 PFU+BR50 BR09-1 BR14 BR100 PFU+BRxx 2* BR100 3* BR100 BR17 BR25 BC25 BC50 BC100 ZArec 4*BR100	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

7.5 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	Designation	Value range	Factory setting
V*	Enter the installation rated speed	0.00 ... 10.00 m/s	1.00
MOD_n*	Input type of the motor speed at installation rated speed **direct:** manual input of 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	0.1 ... 6000 rpm	A 1358.1 S 60.6
__D	Enter the diameter of the traction sheave	0.06 ... 1.50 m	A 0.45 S 0.315
__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 The parameter_i1 is only visible for operation with asynchronous motors.	1 ... 650	1
__i2	Input of i2 of the gearbox ratio i1:i2 The parameter_i2 is only visible for operation with asynchronous motors.	1 ... 1000	32
Q	Enter the elevator installation's rated load	100 ... 32000 kg	600
F	Enter the car weight	100 ... 32000 kg	1000
G	Enter the counterweight	0 ... 32000 kg	1300

7.6 Control system menu

Configuring of:

- elevator control system
- Digital inputs
- Digital outputs

Parameter	Designation	Value range	Factory setting
CONFIG	Configuration of the digital inputs and outputs according to the control system and type of communication used **00:Free:** Outputs are freely configurable **01:ZA_IO:** Ziehl-Abegg standard actuation **02:ZA_CAN:** Ziehl-Abegg CAN **03:BP_IO:** Böhnke+Partner standard control **04:BP_DCP1:** Böhnke & Partner DCP1 **05:BP_DCP2:** Böhnke & Partner DCP2 **06:BP_DCP3:** Böhnke & Partner DCP3 **07:BP_DCP4:** Böhnke & Partner DCP4 **08:KN_IO:** Kollmorgen standard control **09:KN_DCP3:**Kollmorgen DCP3 **10:KN_DCP4:** Kollmorgen DCP4 **11:NL_IO:** New Lift standard control **12:NL_DCP3:** New Lift DCP3 **13:SS_IO:** Schneider Steuerungen standard control **14:SS_DCP3:** Schneider controls DCP3 **15:ZA_BIN:** Ziehl-Abegg standard actuation with binary speed specification **16:WL_IO:** Weber Lifttechnik standard control **17:WL_DCP1**: Weber Lifttechnik DCP1 **18:WL_DCP2**: Weber Lifttechnik DCP2 **19:WL_DCP3:** Weber Lifttechnik DCP3 **20:WL_DCP4:** Weber Lifttechnik DCP4 **21:ST_IO:** Strack Lift Automation standard control **22:ST_DCP3**: Strack Lift Automation DCP3 **23:ST_DCP4:** Strack Lift Automation DCP4 **24:CSILVA:** Carlos Silva standard control **25:X-BIN:** Free binary assignment **26:KW_DCP3:** KW Aufzugstechnik DCP3 **27: MAS_BIN:** Masora standard control **28: BU_SATU:** Hydraulic elevator aggregate with Bucher-Aggregat type Saturn ALPHA **29: BU_ORIO:** Hydraulic elevator aggregate with Bucher-Aggregat type Orion ALPHA **30: KS_IO:** Georg Kühn Control systems standard control **31: KL_IO:** Kleemann standard control **32: S_SMART:** Schindler Smart standard control **33: SS_DCP4:** Schneider controls DCP4 **34: OS_DCP3:** Osma DCP3 **35: Lester:** Lester Controls **36: HY-Mod.:** Hydraulic elevator with DCP4 **37: NL_DCP4:** New Lift DCP4	00:Free 01:ZA_IO 02:ZA_CAN 03:BP_IO 04:BP_DCP1 05:BP_DCP2 06:BP_DCP3 07:BP_DCP4 08:KN_IO 09:KN_DCP3 10:KN_DCP4 11:NL_IO 12:NL_DCP3 13:SS_IO 14:SS_DCP3 15:ZA_BIN 16:WL_IO 17:WL_DCP1 18:WL_DCP2 19:WL_DCP3 20:WL_DCP4 21:ST_IO 22:ST_DCP3 23:ST_DCP4 24:CSILVA 25:X-BIN 26:KW_DCP3 27:MAS_BIN 28:Bucher_SATU 29:Bucher_ORIO 30:KS_IO 31:KL_IO 32:S_SMART 33:SS_DCP4 34:OS_DCP3 35:Lester 36:HY-Mod. 37:NL_DCP4	01:ZA_IO
MO_DR	Changing the rotating direction of the motor It must be observed that with triggering the input RV1 the cabin drives upwards **left:** Rotary direction left **Right:** Clockwise rotation	left right	left

Parameter	Designation	Value range	Factory setting
CTRL	Select the communication between the frequency inverter and the control under "CONFIG=Free" **Standard:** Parallel connection **DCP1:** Communication by DCP01 protocol **DCP2:** Communication by DCP02 protocol **DCP3:** Communication by DCP03 protocol **DCP4:** Communication by DCP04 protocol **CAN:** Communication via CANopen Lift protocol	Standard DCP01 DCP02 DCP03 DCP04 CAN	Standard
X_BIN_1	Allocation of travelling speeds to binary codes for “CONFIG=-X_BIN” (for description of functions, see “Parameter description for digital inputs” table).	00:Free 04:V1 05:V2 06:V3 07:VZ 08:V4 09:V5 10:V6 11:V7 17:v=0	00:Free
X_BIN_2			
X_BIN_3			
X_BIN_4			
X_BIN_5			
X_BIN_6			
X_BIN_7			

Parameter	Designation	Value range	Factory setting
f_I01	Configuration of the function of digital inputs I01 … I08 for “CONFIG=free” (for description of the functions, see “Parameter description for digital inputs” table). Input I08 is free adjustable, independent of "CONFIG".	00:Free 01:RF 02:RV1-UP 03:RV2-DOWN 04:V1 05:V2 06:V3 07:VZ 08:V4 09:V5 10:V6 11:V7 12:PARA2 13:BIN0 14:BIN1 15:BIN2 16:DIR(1=UP) 17:v=0 18:RF+RV1 19:RF+RV2 20:BR1 21:BR2 22:BR3 23:BR4 24:XBIN0 25:XBIN1 26:XBIN2 27:MBIN0 28:MBIN1 29:MBIN2 30: STANDBY2 31:STEP+ 32:STEP- 33:PFU_BR 34:HY_UP 35:HY_DOWN 36:/DELAY 37:DTE 38:RECORD 39:INV_A1 40:FKT.ana 41:Monitor 43: STANDBY1 44:ZR_RDY 45:/ESC 46:SBC_RDY 47:CO 48: EVA act. 49: MOT_TEMP 50: RF+V1	01:RF
f_I02			04:V1
f_I03			05:V2
f_I04			06:V3
f_I05			07:VZ
f_I06			02:RV1-UP
f_I07			03:RV2-DOWN
f_I08			00:Free
f_XBR1	Configuration of the function of brake monitoring inputs BR1 ... BR4 (for description of functions, see “Parameter description for digital inputs” table)		20:BR1
f_XBR2			21:BR2
f_XBR3			22:BR3
f_XBR4			00:Free

Parameter	Designation	Value range	Factory setting
f_O1	Configuration of the function of digital outputs O1 … O5 for "CONFIG=free" (for description of functions, see "Parameter description for digital outputs" table).	Off RB /RB V<V_G1 V<V_G2 V<1.1*V_3 Warning Fault Evac.Dir. MB_Brake /V<V_G1 /V<V_G2 V=0 PFU Info rope TD_CNT ext. Full load SD STO-Info /STO info BR Info ZR_EN Stutter br. MotShorts EvaDisMains P<0 VentStrg ZAdyn ready	Fault
f_O2			MB_Brake
f_O3			RB contactor
f_O4			V < V_G1
f_O5			STO-Info
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
LIFT_NO	Enter the lift number	1 ... 2	1
NODE_ID	Node number, normally: Control system: 1 ZAdynpro: 2 Encoder: 4	1 ... 128	2
BD_RATE	Bitrate	10 kBd ... 250 kBd	250 kBd
T_CMD	Maximum waiting time for commands of the control system	200 ... 3000 ms	1500 ms
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 in the case of Config="32:-S_Smart": On
A_MAX	Delay in elevator emergency stop due to deactivation of the input with the function "/DELAY"	0.2...2.55m/s^2	1.00 m/s^2
S_B_OFF	Additional braking offset	0 ... 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	Enabling the ZAdynpro. The input must be activated during the entire journey.
02:RV1	Direction preset UP	Travel direction "UP"
03:RV2	Direction prest DOWN	Travel direction "DOWN"
04:V1	Positioning speed	Speed to position the car to the stop point
05:V2	Intermediate speed	If necessary, the intermadiate speed for normal travel
06:V3	travel speed	High travel speed for normal travel
07:VZ	Readjustment speed	Speed for readjustment. Has precedence above all other speeds!
08:V4	Additional speed 1	Additional speed for inspection and return operation
09:V5	Additional speed 2	Additional speed for inspection and return operation
10:V6	Additional speed 3	Additional speed for inspection and return operation
11:V7	Additional speed 4	Additional speed for inspection and return operation
12:PARA2	Switchover to 2nd parameter set	2nd parameter set is activated
13:BIN0	Binary input 0	Speed default through binary coding Standard-configuration
14:BIN1	Binary input 1	Speed default through binary coding Standard-configuration
15:BIN2	Binary input 2	Speed default through binary coding Standard-configuration
16:DIR	Direction	Default for direction of travel when using one input 1 signal: Direction of travel "UP" 0 signal: Direction of travel "DOWN"
17:v=0	Hold speed 0	When the motor brake is open, speed 0 is controlled
18:RF+RV1	Controller enable + travel direction UP	Controller enable and travel direction "UP" are triggered with one input
19:RF+RV2	Controller enable + travel direction DOWN	Controller enable and travel direction "DOWN" are triggered with one input
20:BR1	Brake monitoring 1	Brake monitoring with unsing the input terminal X-IN
21:BR2	Brake monitoring 2	Brake monitoring with unsing the input terminal X-IN
22:BR3	Brake monitoring 3	Brake monitoring with unsing the input terminal X-IN
23:BR4	Brake monitoring 4	Brake monitoring with unsing the input terminal X-IN
24:XBIN0	Binary input 0 Free binary assignment	Speed default through binary coding Free binary assignment
25:XBIN1	Binary input 1 Free binary assignment	Speed default through binary coding Free binary assignment
26:XBIN2	Binary input 2 Free binary assignment	Speed default through binary coding Free binary assignment
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 ZAdynpro 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	BR monitoring for option PFU+BR	Functional monitoring of brake resistor when using a brake resistor in conjunction with power recuperation 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 ZAdyn HY

Parameter	Function	Explanation
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 ZAdyn HY
36:/FastStp	Delay in emergency stop	When deactivating the input the motor is braked with the delay set in the "Control System/A_MAX" menu
37:DTE	Ziehl-Abegg test function	Reserved for Ziehl-Abegg
38:RECORD	Recorder function	Start or stop measurement by external signal **Input activated:** Measurement is active **Input deactivated:** Measurement is stopped and saved
39:INV_A1	Direction UP at hydraulic elevator with Bucher aggregate type Orion ALPHA	Inverting the analog target value A1
40:FKT.ana	Ziehl-Abegg test function	Reserved for Ziehl-Abegg
41:Monitor	Monitoring function for manually evacuation	Shown evacuation direction and evacution speed
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 ZAdynpro to Standby 1 function to save energy
44: ZR_RDY	ZArec ready	ZArec monitoring function
45: /ESC	/ESC	Electronic short-circuit is deactivated
46:SBC_RDY	ZAsbc4C ready	ZAsbc4C monitoring function
47:CO	Function not assigned	
48: EVA act.	Display: Battery evacuation active	If switching to battery supply takes place during travel, this input function must be set.
49: MOT_TEMP	External motor temperature monitoring	If an external device is used for monitoring the motor temperature, this input function can be used to display overtemperature of the motor.
50: RF+V1	Controller enable and positioning speed	Enable for the ZAdyn and speed for positioning the car at the stop

Parameter descriptions for digital outputs

Parameter	Function	Explanation
Off	Output has no function	Output is open all the time
RB	Controller ready Switching the motor contactors Activating the inputs of the STO function	Contact closes when the following signals are present: Controller enable, travelling speed and direction specification. When closing the contact, the inputs of the STO function must be activated without delay or the motor contactors connected.
/RB	Inverted function of "RB contactor"	Contact opens when the following signals are applied: Controller enable, traveling speed and direction.
V<V_G1	Speed monitoring	Contact opens when the limit value V_G1 set in the “Control System” menu 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 (for ZAdyn4) 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 ZAdynpro.
Evac.Dir.	Evacuation direction	Contact open: Car is lighter than counterweight Contact closed: car is heavier than counterweight

Parameter	Function	Explanation
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.
/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.
/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	Recuperation unit	Switching the feedback unit to standby function to save energy
Suspension means	Suspension means replacement necessary	Contact closes if the current suspension means can be used for approx. 1 more 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
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).
BR Info	Status of brake monitor inputs BR1...BR4	The contact is closed when the brakes are open during travel
ZR_EN	ZArec: Enable of ZArec4C power feedback unit	Contact closes when the following signals are present: controller enable, travelling speed and direction specification.
Stutter br.	Stutter brake	Contact opens if the speed of the elevator cabin exceeds the limit value configured in the parameter V_G1. Contact closes if the speed is below the limit value.
MotShorts	Signal for switching a motor short-circuit contactor	If an external contactor is used to short-circuit the motor, this signal can be used to switch it.
EvaDisMains	Signal for disconnecting the mains for emergency evacuation via battery	If the system is switched to battery operation (see input function 48:EVA act.), this output signal disconnects the mains. As soon as the system is at a standstill, the ZAdyn restarts and waits for the line voltage to be restored.
P<0	Regenerative operation	The output is activated as soon as the ZAdyn is in regenerative operation and is no longer drawing power from the line.
VentStrg	Internal function of ZIEHL-ABEGG SE	Internal function of ZIEHL-ABEGG SE
ZAdyn ready	ZAdyn ready	The output is activated when the ZAdyn is ready to accept a travel command

7.7 Monitoring menu

Configuring the monitoring functions

Parameter	Designation	Value range	Factory setting
MOD_ST	Behavior of the ZAdynpro during 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 to “ST” drops out for 2 seconds in the event of a malfunction and then increases again **Lock n.3:** Block function after 3 malfunctions. Output "ST" remains dropped after the 3rd error **Lock n.2:** Locking function after 2 errors. The “ST” output remains de-energised after the 2nd error. **Lock n.1:** Block function after 1 malfunction. Output "ST" remains dropped after the 1st error. With the blocking function, the following message appears: “ZAdyn lock! To unlock, press OK.” After pressing the “i” key, the device reverts to normal operation. The errors that led to locking are marked accordingly 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
LOCK_X	Block at brake malfunction The ZAdynpro is locked in case of brake malfunctions if this parameter is switched on. With **CONFIG: 31:KL_IO** LOCK_X is automatically activated	ON OFF	OFF
UNLOCK	Lifting the block in the event of a brake malfunction. The lock is lifted in case of brake malfunctions if this parameter is switched on.	ON OFF	OFF
CO	Monitoring the travel contactors **OFF:** Contactor monitoring deactivated **CO1:** Contactor monitoring is only implemented by input CO1 (series connection of the monitoring contacts) **CO1&CO2:** Contactor monitoring is implemented by inputsCO1 and CO2 (individual monitoring of the monitoring contacts)	OFF CO1 CO1&CO2	AUS

Parameter	Designation	Value range	Factory setting
BR	Motor brake monitoring Input of number and function of the brake monitoring contacts used **OFF:** No brake monitoring connected **1*NC:** 1x normally closed contact (Contact closed when brake currentless) **2x NC:** 2x Normally closed contact (contact closed when brake is currentless) **3x NC:** 3x Normally closed contact (contact closed when brake is currentless) **1*NO:** 1 x normally open (contact is open when brake currentless) **2x NO:** 2x Normally open contact (contact open when brake is currentless) **3x NO:** 3x Normally open contact (contact open when brake is currentless) **4*NC:** 4 x normally closed contact (Contact closed when brake currentless) **4*NO:** 4 x normally open (contact is open when brake currentless) **1xNC+1xNO:** 1x NC contact (BR1) and 1x NO contact (BR2)	Off 1*NC 2*NC 3*NC 1*NO 2*NO 3*NO 4*NC 4*NO 1*NC+1*NO	accordingly to motor type
P1P2	Motor temperature monitoring **OFF:** Temperature monitoring deactivated **PTC:** thermistor (PTC according to DIN 44082) **TC:** Thermal circuit breaker **KTY:** Temperature sensor KTY84-130 **Pt100:** Temperature sensor Pt100 **Pt1000:** Temperature sensor Pt1000	Off PTC TC KTY Pt100 Pt1000	PTC
T_P1P2	Only accessible if the **P1P2** parameter is configured to "KTY", "PTC", "Pt100" or "Pt1000" Trigger temperature for motor temperature monitoring	50...180°C	130°C
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_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	0.1
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 %	130

Parameter	Designation	Value range	Factory setting
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
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
MSK_NEG	Negative error screen Inactive errors are activated by configuring the corresponding error numbers	Error no.	0

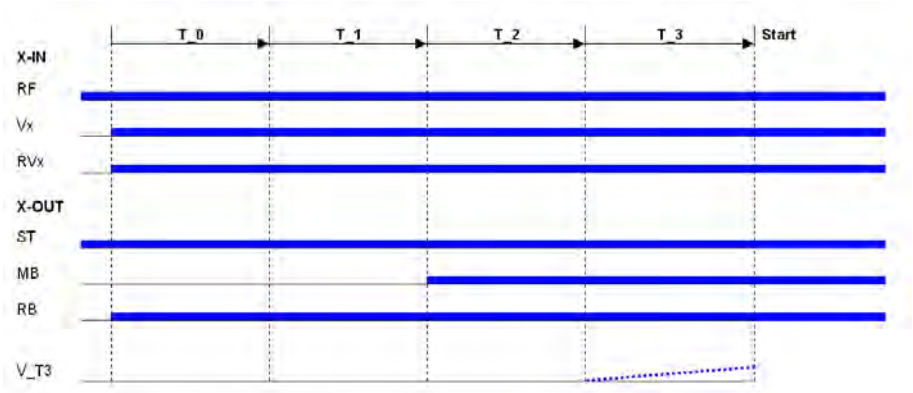
7.8 Start menu

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

Parameter	Designation	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 Multiplication factor for the parameter "Controller/SPD_KP" or amplification of the position controller (dependent on the start-up mode)	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 supplying the motor 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 a magnetic field in the motor (asynchronous motors only) A The parameter T_1 is only visible for operation with asynchronous motors.	A 0.1 … 10.0 s S Value set to 0.0	A 0.1
T_2	Maximum brake opening time After expiration of time "T_1", the brake must have opened within time "T_2"	0.0 … 15.0 s	S 1.8, for MOT_-TYP=SM250: 2.5 A 0.6
T_2 real	Measured time that the brake requires to open	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 … 20.0 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 … 100 mm/s	0

Parameter	Designation	Value range	Factory setting
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

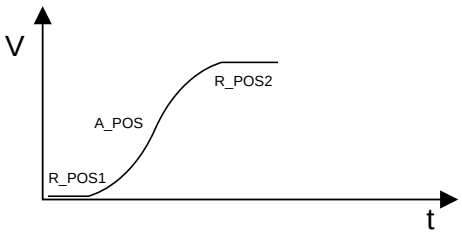
Start-up time sequence



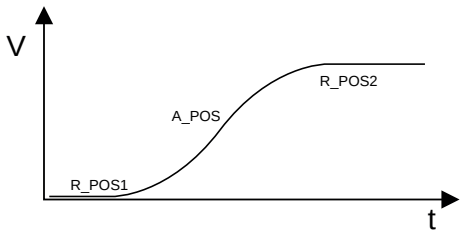
7.9 Acceleration menu

Definition of acceleration ramp.

Parameter	Designation	Value range	Factory setting
A_POS	Positive acceleration	0.12 ... 2.00 m/s²	0.5
R_POS1	Lower round off during positive acceleration, a higher value causes a softer round off	5 ... 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

7.10 Travel menu

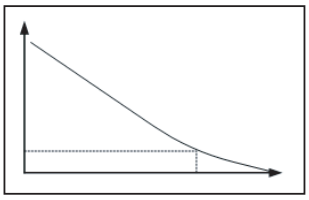
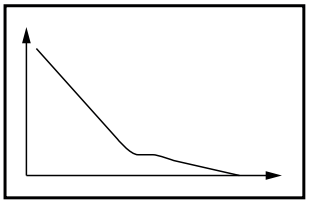
Traveling speed defaults

Parameter	Designation	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 ... 6.50 m/s	0.50
V_3	High travelling speed Speed for normal travel	0.03 ... 10.00 m/s	0.95

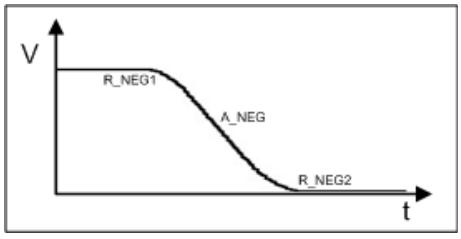
Parameter	Designation	Value range	Factory setting
V_Z	Readjustment speed Speed for readjusting the car position during car loading or unloading	0.003 ... 0.30 m/s	0.01
V_4	Additional speed	0.03 ... 3.50 m/s	0.30
V_5	Additional speed	0.03 ... 3.50 m/s	0.30
V_6	Additional speed	0.03 ... 3.50 m/s	0.05
V_7	Additional speed	0.03 ... 3.50 m/s	0.05

7.11 Decelerating menu

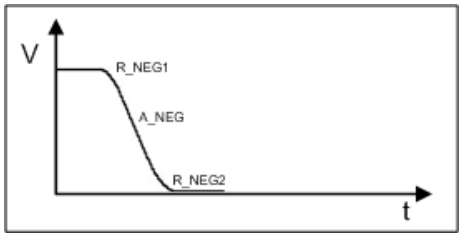
Defines the deceleration ramp and optimizes the positioning behavior.

Parameter	Designation	Value range	Factory setting
A_NEG	Negative acceleration	0.12 ... 2.00 m/s²	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 Travelling speed V_3 is switched off, delayed by the configured value	0.00 ... 2.00 m	0
S_DI2	Dist. correction V2 Travelling speed V_2 is switched off, delayed by the configured value	0.00 ... 2.00 m	0
S_DI1	Dist. correction V1 Travelling speed V_1 is switched off, delayed by the configured value	0 ... 150 mm	0
S_ABH	**OFF:** For standard, DCP1 or DCP3 and CANopen lift (Velocity mode) control: time-dependent deceleration, deceleration paths can vary. **On (V2_7):** Distance-dependent deceleration, time-optimised engagement. The setting is effective at all travelling speeds. **On (V2_3):** Distance-dependent deceleration, time-optimised engagement. The setting is effective at travelling speeds V_2 and V_3.  Distance-dependent deceleration, time-optimised engagement. **Slow:** Distance-dependent deceleration, landing with early reduction of levelling speed  Distance-dependent deceleration, landing with early reduction of levelling speed	Off On (V2..7) Slow On (V2..3)	On (V2..3)

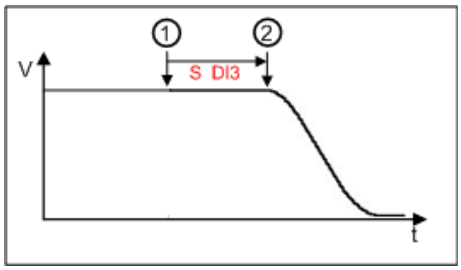
Parameter	Designation	Value range	Factory setting
DCP_FIL	DCP filter type **Off:** Function deactivated **Opt.4:** Function not assigned **Opt.3:** Function not assigned **Opt.2:** Function not assigned **Opt.1:** Travel behaviour is optimised during deceleration (for DCP4 only) Where the use of DCP_FIL = Opt. 1 is recommended, the message "DCP cycle time! (DCP_FIL = Opt.1 ?)" [Zykluszeit DCP! (DCP_FIL = Opt. 1 ?)] is displayed at the end of travel. The parameter is only displayed with DCP actuation.	Off Opt.4 Opt.3 Opt.2 Opt.1	Off



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

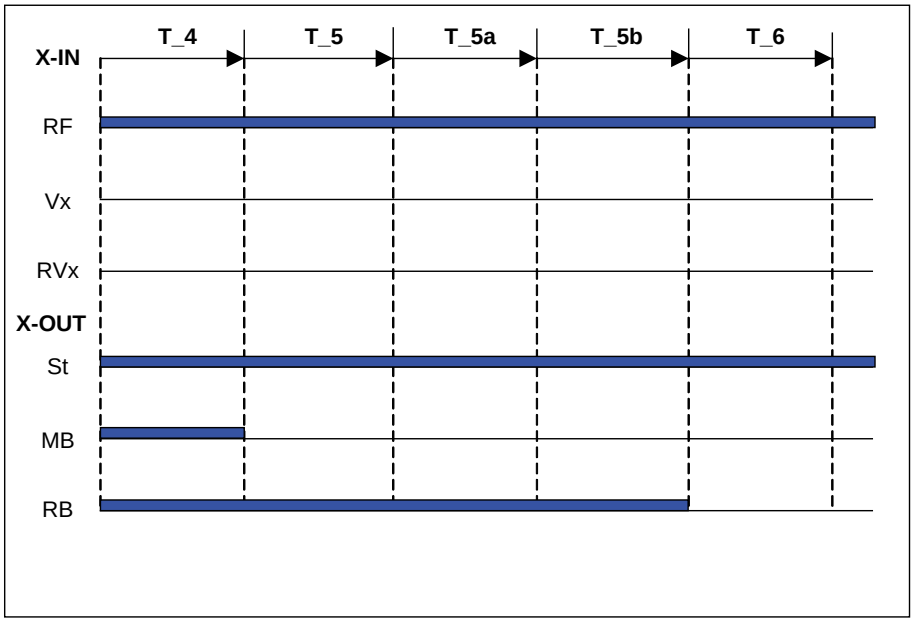
7.12 Stop menu

Chronological sequence after reaching speed 0 during stopping procedure.

Parameter	Designation	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	A 0.6 S 1.5, in the case of MOT_-TYP=SM250: 2.0
T_5a	S 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

Parameter	Designation	Value range	Factory setting
T_6	Wait until contactors open Time within which the contacts of the motor contactors must be opened	0.0 ... 10.0 s	0.5

Stopping time sequence



7.13 Controller menu

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

Parameter	Designation	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 ... 500 ms	100
IQ_KP	Current controller basic gain	0.1...127	1.5
IQ_TI	Current controller adjustment time	1...50 ms	15 ms
NF	S Noise filter This parameter activates a noise filter that enables noise caused by the motor to be reduced (synchronous motors only).	Off On	Off
NF_F1	S Filter-Freq.1: Number of slots Enter the number of slots on a synchronous motor (synchronous motors only).	0...1018	0

Information
The parameters required for open loop operation (encoderless operation) are only displayed in open loop operation. The parameters are described in the “Open loop operation (encoderless operation)” chapter.

7.14 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	Designation	Value range	Factory setting
f_PARA2	Function allocation of parameter set 2 **Locked:** 2nd parameter set is blocked **2nd parameter set:** Activation of 2nd 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 with UPS **USV:** Emergency evacuation by UPS with reduced power **EVA.>=110:** Emergency evacuation with feed via the DC+/DC- pins at connection terminal X2 (only on ZAdyn4Bplus)	Locked 2nd parameter set EVAC 3 EVA. 3*AC EVA. 1*AC USV EVA.>=110	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)	115 ... 565 V	120
P_UPS	Max. load on 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
R_U20	Stator resistor Enter the resistor of the stator of the motor with "f_PARA2=UPS"	0.00 ... 10.00 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 **OFF:** Function deactivated **PARA1->2:** copies the data from 1st parameter set into the 2nd parameter set	Off Para 1->2	Off

7.15 Statistic menu

All statistical data can be called up in the **Statistics** menu. The data will be retained even after the ZAdynpro has been switched off. Reading out the error list and deleting the error memory are described in the chapter "Error diagnosis".

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

Parameter	Designation	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
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_CLR	Delete error memory Deletes ST_LST, ST_RES and ST_SRF and ST_SCO	On Off	Aus	
CRC_SAF	Shows a checksum for the set values of the safety-related parameters BR, STO and TD_RES	Cannot be set	-	X
APD	Automatic parameter diagnosis, see "Error diagnosis" chapter **On:** Automatic parameter diagnostics is activated **Off:** Automatic parameter diagnostics is deactivated	On Off	Off	
RESET	Deletes parameters, counter levels and error lists, preassigning parameters with standard values. **77:** **Pre-parametrised ZAdynpro:** Parameters are assigned customer-specific system data **Standard ZAdynpro:** Parameters are assigned standard data **90:** Device reset, parameters are deleted and set to factory settings. ENC_OFF is retained. **99:** Device reset, parameters are deleted and set to factory settings. ENC_OFF is deleted. S If a value is entered for the rotary encoder offset (ECOFF), it will also be deleted!	77 90 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 = no 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	
TD_SET	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 ... 16.67 M	0.00	
TD_RST	Restore the counter level from the rotary encoder	On Off	Off	

7.16 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	Designation	Value range	Factory setting	visible in the basic level
SAV_ALL	Saves data to memory card with serial number allocation • Parameter list (.PRT) in folder /4CX/DEVICE/[Serial number]/LST • Error list (.FLT) in folder /4CX/DEVICE/[Serial number]/LST • Parameters (.PA3) in folder /4CX/DEVICE/[Serial number]/-PAR • Black box (.BOX) in folder /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
SAV_PAR	Save parameters to memory card (copy parameters in the case of identical systems): • Parameter (.PA4) in directory /4CX/DEVICE/FORCE Here, there is no serial number allocation. The data will be over-written 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	Entry for codes created depending on the ZAdyn serial number and firmware version.	0...65535	0	
SAV_CFG	Saves data to memory card with configuration number allocation: • Parameter list (.PRT) in directory /4Cx/CONFIG/configuration • Parameter (.PA3) in directory /4CX/CONFIG/configuration number	0 ... 65535	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 ... 65535	0	
DIR_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 ... 65535	0	
Format	Reformatting the memory card: **Input 27:** Folders and files on the memory card are deleted	27	0	

7.17 MMC-Recorder menue

You have the option of performing measurements on the ZAdynpro using a memory card without the need for a notebook. The measurement is configured in the **MMC recorder** menu.

Parameter	Designation	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". **ZAmon:** Mode for using ZAmon software The settings for REC_MOD can only be changed with REC_CFG=0.	Off On Stop&Shot ZAmon	Off
REC_CFG	Configuring the measurement channels **0:** All measuring channels and the recording time can be freely configured **1 … 9:** Permanently set configurations that cannot be modified **20:** Configuration for HY operation	0 1 2 3 4 5 6 7 8 9 20	1
TRIG_BY	Trigger-source Specifications for stopping the recorder and saving the data to the memory card. **Error:** Data is 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 **Cont.:** Function is not used **Interval:** Function is not used **Ext.Input:** Function is not used	Error Error/Stop Cont. Interval Ext.Input	1.0
T_REC	Record-time Time for a measurement with 1024 measured values For a recording time of 5 s, for example, measured values are recorded every 5 ms	5 s 10 s 15 s 20 s 40 s 80 s 160 s 0.5 h 1 h 24 h	5
T_DLY	Trigger Delay Delay time for stopping of the masurement, e.g. T_DLY=0.5s: the recording will be stopped 0.5s after an error occurs.	0.5 s	0.5 s

Parameter	Designation	Value range	Factory setting
CHN1	Configuration of the measuring channels 1-4 with analog measurement values **1:** Setpoint for travelling 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] **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 **142:** Intermediate circuit voltage [V] **143:** torque build-up current [A] **213:** Remaining distance specification **214:** Braking distance **215:** Target speed	0...299	3
CHN2			1
CHN3			143
CHN4			6
CHN5	Configuration of the measuring channel 5 with digital measurement values **89:** digital in- and outputs with indication of the function **90:** digital in- and outputs optimized for brake monitoring **91:** digital in- and outputs **92:** DCP command and status bits **118:** CAN bits in Velocity mode **137:** CAN bits in Position mode	0...299	89

7.18 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.

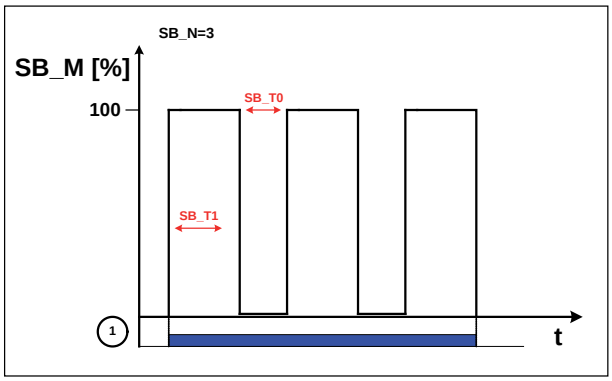
Parameter	Designation	Value range	Factory setting
ENC_ADJ	Activating the encoder alignment **Off:** no function **Check:** Activates load-free rotary encoder adjustment check **Load-free:** Activates load-free rotary encoder adjustment **Braked:** Activates rotary encoder adjustment with closed brake **Mag.Adhesion:**Start magnet adhesion process for operation with Kone EcoDisc type drives. **Mag.Exist.:**Enables replacement of the ZAdyn without carrying out the magnet adhesion process again with Kone EcoDisc type drives.	Off Check No load Braked Mag.Adhesion Mag.Exist.	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	Correction value for encoder offset When performing rotary encoder adjustment with a closed brake, the offset value is saved in this parameter.	0 ... 360.00°	0

Parameter	Designation	Value range	Factory setting
SAV_P_E	Storing of data in the absolute value encoder via the "Electronic rating plate" function (only possible with EnDat or Hiperface absolute value encoders) **ON:** Data from the ZAdynpro are filed in the absolute encoder **Off:** Function deactivated	On Off	Off
LOD_P_E	Reading of data from the absolute value encoder via the "Electronic rating plate" function (only possible with EnDat or Hiperface absolute value encoders) **Input 27:** Data are read out from the absolute encoder into the ZAdynpro	0...65535	0

7.19 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	Designation	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)	1 ... 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"

7.20 HW-Ident. menu

Identifying the individual assemblies of the ZAdynpro. The identification of the assembly is generally read out directly from its EEPROM.

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

7.21 Power section menu

Configuring the tolerances of the internal power stage.

Parameter	Designation	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	ZAdyn 011-040: Auto ZAdyn 050-074: A Asynchronous motors: Auto S Synchronous motors: Fix f_PWM ZAdyn 110-220: Auto
f_PWM	Cycle frequency at parameter setting "M_PWM=Fix f_PWM"	ZAdyn 011-074: 3.7 ... 10.0 kHz ZAdyn 110-220: 3.7 ... 8.0 kHz	ZAdyn 011-074: 8.0 ZAdyn 110-220: 3.7
f_PWM_H	Maximum cycle frequency (start frequency) at parameter setting "M_PWM=Auto" Parameter is only shown for "M_PWM=Auto".	ZAdyn 011-074: 5.0 ... 16.0 kHz ZAdyn 110-220: 5 ... 8.0 kHz	ZAdyn 011-074: 16.0 ZAdyn 110-220: 7.4
UDC_N	DC voltage for the DC-link	100 ... 680 V	565
UDC_MIN	Minimum limit value of the DC-link voltage	90 ... 565 V	450
UDC_MAX	Maximum limit value of the DC-link voltage	100 ... 760 V	760
FAN_T	Power stage temperature at which the fan is switched on	28 ... 60 °C	50

7.22 Menu checks

Selection of supporting tests during acceptance of the system:

- Testing the protective device in compliance with EN81

Parameter	Designation	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	Off
SCY_TMP	Motor temperature test **On:** Failure of the motor temperature module or overtemperature on the motor is simulated **Off:** Function deactivated	On Off	Off
SCY_A3	Testing the protective device in compliance with EN81 **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	Powerless max. accel. Off	Off
SCY_SG	Capture device test **On:** electronic short-circuit is deactivated **Off:** Function deactivated	On Off	Off
SCY_DA	Driving capability test **On:** Travel with recovery with applied counterweight, display of cabin movement **Off:** Function deactivated Only for CAN actuation.	On Off	Off
SCY_MB	Engine brakes test **On:** Interruption of the safety circuit, display of braking distance **Off:** Function deactivated Only for CAN actuation.	On Off	Off

7.23 ZA-Intern menu

Parameterisation of internal measuring and monitoring functions

Parameter	Designation	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.:** Check is carried out before starting all travel **Off:** Motor phase check is deactivated	Single Cont Off	Single
UVW_PEK	Test voltage for motor phase check **1 ... 10 V:** Selection of the test voltage between 1 V and 10 V. In case of an error the testing voltage is displayed in the error message. **15 V:**Test voltage 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)

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

7.24 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.

Series number: - - - - 01 ZAdynxx SN: 06128238/0001 4.42-110308xx	**Page 01: Serial-No.** **Line 2:** Display of frequency inverter type and frame size **Line 3:** Serial number/type consecutively numbered **Line 4:** Software version Loaded 3rd operating language
status - - - - - - - - - - 02 ▷ System OFF ◀ 530◦540◦550◦560◦ 100 ^0.00 0.00 0.00m/s	**Page 02: Status** **Line 2:** current operating status in plain text display **Line 3:** last 5 operating statuses current operating status is displayed on right in total, the last 60 operating statuses can be inquired: Previous page ESC Next page ↵ The current condition will be indicated with the arrows > < The previous conditions are indicated with the arrows < > **Line 4:** current direction of travel current position of car in the shaft current travel path with positioning speed current traveling speed
Dist. - - - - - - - - - - - 03 sa: 0.00 s21: 0.52m sr:^0.00 s31: 1.45m s1: 0.00 sd: 0.52m	**Page 03: Dist** **Line 2:** sa: current position of car in the shaft s21: calculated deceleration path V_2 ◦ V_1 s20: calculated deceleration path V_2 ◦ Standstill (only in DCP02/DCP04) **Line 3:** sr: current direction of travel, current total route s31: calculated deceleration path V_3 ◦ V_1 s30: calculated deceleration path V_3 ◦ Standstill (only in DCP02/DCP04) **Line 4:** s1: current travel path with positioning speed V_1 (not used in DCP02 / DCP04) sd:real deceleration path V_3 ◦ V_1 or V_2 ◦ V_1 The display can be frozen by pressing the ↵ key.

Mot - - - - - - - - - - - - 04 ▮▮▮ _ _ _ _ _ _ _+0% real: 0rpm 0V prog: 0rpm +0.0A	**Page 04: Mot** **Line 2:** Bar chart of motor speed A Slip in % S Load angle in ° **Line 3:** Actual motor speed Motor voltage **Line 4:** Target motor speed Motor current A If the motor has been correctly adjusted, the slip is nearly proportional to the motor's rated current (e.g. 50% motor current = 50% slip). The display can be frozen by pressing the ↵ key.
MotDat - - - - - - - - - - 05 I: 11.0A n: 60rp U: 360V f:10Hz p: 10	**Page 05: MotDat** Display of the motor data entered in the "Motor name plate" menu: S **Line 2:** Rated current Rated speed **Line 3:** Rated voltage Rated frequency **Line 4:** Number of pole pairs A **Line 2:** Rated current Rated speed **Line 3:** cos phi Rated frequency **Line 4:** Magnetization current Rotor time constant
MotDat - - - - - - - - - - 05 I: 11.0A n: 1450rp cos:0.88 f: 50.0Hz I0: 3.8A TR: 316ms	
MotDatFW- - - - - - - - - 05 I: 11.0A n: 1560rp cos:0.89 f: 53.4Hz I0: 3.5A TR: 316ms	**Page 05: MotDatFW** Display of the calculated motor data with field weakening operation: A **Line 2:** Rated current Rated speed **Line 3:** cos phi Rated frequency **Line 4:** Magnetization current Rotor time constant **Page 05: MotDatNom** Pressing the ↵ key displays the original motor data
MotDatNom - - - - - - - - 05 I: 11.0A n: 1450rp cos:0.88 f: 50.0Hz I0: 3.8A TR: 316ms	

RegLimits - - - - - - - - 06 SP IQ ID PS U LIM:.. •. .. .. . PEK:	**Page 06: RegLimits** Online display of whether a control loop has reached the limit **Line 2:** SP: Speed controller IQ: Current controller (torque creation current) ID: Current controller (flux creation current) PS: Position controller U: Voltage limit of the frequency inverter **Line 3:** Dot left: minimum limit reached Dot right: maximum limit reached **Line 4:** Alarm bell left: minimum limit reached in previous journey Alarm bell right: maximum limit reached in previous journey No alarm bell should appear during a faultless, normal trip.
Brake-Chopper - - - - - 07 Internal 1.4kHz BC • U_DC:_ _ _ _ _ _ 565V Ampl:_ _ _ _ _ _ 0%	**Page 07: Brake-Chopper** Online-display **Line 2:** Internal PWM frequency (only for brake resistor) Condition of function and temperature monitoring on the input terminal BC (larger point = OK) **Line 3:** DC-link voltage as bar chart display DC-link voltage **Line 4 (only with Brake resistor):** Modulation of Brake resistor as bar chart display Modulation of Brake resistor in % The DC-link voltage displayed in standstill must have the value “Mains connection voltage x 1,41". A large point must constantly be displayed behind the function and condition monitor. Pressing the ↵ button Display will be frozen Display of the load of the brake resistor (average value over 120s)
Cu-Functions- - - - - - 08 CONFIG 00: Free I:RF RV2 V2 >0.500 O:ST RB MB ... V>G1	**Page 08: Cu-Functions** Online-display **Line 2:** Selected control system configuration in menu "Control system/CONFIG" **Line 3:** Active digital input functions: • Controller enable (RF) • Direction of travel (RV) • Travelling speed (V) in m/s **Line 4:** Active digital output functions

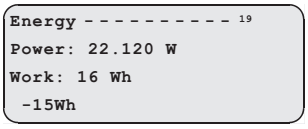
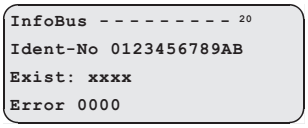
Start/Stop - - - - - - - 09 STOA:• STOB:• DIAG:• RF RB CO MB BR1234 • . . . .->.	**Page 09: Start / Stop** Online display of the digital inputs and outputs important for the start / stop process: **Line 2:** STOA: Status STO_A (input) STOB: Status STO_B (input) Large dot next to the designation indicates that there is a signal at the input and the internal diagnostic unit for monitoring the STP inputs has detected no error If there is no signal at the inputs, the amplifier is securely locked (STO activated). 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 **Line 4:** RF, RB, CO, MB, BRx: A large dot beneath the description indicates the input or output is active A "!" under the monitor input "CO" or "BR" indicates that this monitoring function has been deactivated in the "Monitoring" menu. After “->”: Status of electronic short-circuit: Small dot: short-circuit deactivated Large dot: short-circuit active o: short-circuit switches from inactive to active (duration < 0.1 s) t: short-circuit switches from active to inactive (duration 1.1 s)
Cu-Ports- - - - - - - - - 10 In: BR1234....Out: 12345678 B C12 12345 .... • .. ...•	**Page 10: Cu-Ports** Online-display **Line 2:** Brake monitoring inputs BR1...BR4, large dot after BR1...BR4 indicates the input is active **Line 3:** 1…8: digital inputs I1…I8 B: Function and temperature monitoring for brake resistor or brake chopper C12: Contactor monitoring 1…5: Digital outputs O1…O5 **Line 4:** A big dot below the description displays the input or output is active

Encoder - - - - - - - - - 11 2048Inc 5.03V Type? En:• •Err: 0x00000000 Cnt:3941=345° A B	**Page 11: Encoder** Online-display **Line 2:** Configured rotary encoder resolution Rotary encoder supply voltage 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) The display can be frozen by pressing the ↵ key.
Power1 - - - - - - - - - - 12 DC IGBT PWM ED: 10% •• •• .. ▌ FAN: 0% UDC:565V Temp: 28C	**Page 12: Power1** Power stage condition (point for condition OK) **Line 2 und 3:** DC: first point: Precharge relay switched on second point: Power stage power supply both points must be active during normal operation IGBT: first point: ower stage power supply second point: Power stage power supply OK both points must be active during normal operation PWM: first point: PWM power stage enabled second point: Power stage power supply OK Both points are only active during driving Bar display under M: narrow: Clock frequency 4 kHz fixed medium: Clock frequency 8 kHz wide: Clock frequency 16 kHz ED: Duty cycle of the ZAdynpro (time interval: 10 minutes) FAN: Speed of the fan in % If the ↵ button is pressed, the temperature of the module print will be displayed in line 3 on the right ("MP:xxxC"). **Line 4:** UDC: DC-link voltage Temp: Power stage temperature The display can be frozen by pressing the ↵ key.

Power2 - - - - - - - - - - 13 ERR_EXT U. OC: ... SRC_APP. UCE_P: ... SRC_MOP. UCE_M:	**Page 13: Power2** Cause for excess current malfunction **Line 2:** ERR_EXT: Overcurrent message (display is not saved; point is only displayed if overcurrent is present) U: Overvoltage error in the DC-link (voltage higher than 850 V DC) OC: overcurrent was detected by the current sensors (incorrect phase is indicated by letters U V W) **Line 3:** SRC_APP: Overcurrent is detected by the application processor. UCE_P: Error in positive current path in power stage (faulty phase is displayed) **Line 4:** SRC_MOP: Overcurrent is detected by the motor management processor. UCE_M: Error in negative current path in power stage (faulty phase is displayed) During normal operation, no points and phase displays (U V W) should be active During a malfunction, the displays remain active until the next travel command (with the exception of ERR_EXT)
Bus Info 1 - - - - - - - 14 Info: xx 0101 / 010106 de Load: 77% - 12.3A	**Page 14: Bus Info 1** Information about the control system **Line 2:** Manufacturer: **Line 3:** Software version of control system Software date of the control system Operating language set in the control system, display according to ISO639 The operating language of the frequency inverter is automatically adapted. **Line 4 (only with DCP4):** Load in % (0% = cabin empty) Load-dependent start torque current
Bus Info 2 - - - - - - - 15 B01..4... G....4... S.1....6. 100 RF UP V_3* MTW	**Page 15: Bus Info 2** Online-display **Line 2:** Command and speed bytes B= command byte G= speed byte **Line 3:** Status byte S= Statusbyte Current operating state of the ZAdynpro **Line 4:** Display of the actual travel commands: RF: Controller enable Travel direction controlled travel speed MTW: Motor temperature pre-warning, displayed at overtemperature (for ZAdyn4) See chapter "Serial Communication / DCP (Drive Control & Position)" for further information about DCP operation.

Display 1 Bus Info 3 - - - - - - - 16 sv_I7: +0002210mm sv: +0002198mm Prg:Rea 1.15:x.xxm/s **Display 2** Bus Info 3 - - - - - - - 16 sv_I7: +0002210mm sv: +0002198mm Prg:Rea 1.15:1.10m/s	**Page 16: Bus Info 3** Online-display **Line 2:** Display of the deceleration path. The deceleration path is calculated before starting the journey. **Line 3:** Display of the remaining path. The display is updated during travel continually. **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)
Bus Info 4 - - - - - - - 17 RX_TIM 1 RX_XOR 0 TX_ERR 0	**Page 17: Bus Info 4** 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
Bus Info 1- - - - - - - - - - - - - 14 Act• Mode: Velocity T_max: 0 RErr: 0 NMT:Preop./Warn.Lim: Bus Info 1- - - - - - - - - - - - - 14 Act• Mode: Velocity T_max:0.7ms TErr: 0 NMT:Preop./Warn.Lim:	**Page 14: Bus Info 1** Information on CANopen lift operation **Line 2:** Act: A dot signals that the ZAdynpro is set to CAN Mode: Operating mode (velocity or position) **Line 3:** T_max: Number of cycles, which excessed the maximum process time RErr: Recieve buffer - error counter **Line 4:** NMT: Shows the actual NMT status (see chapter "Serial Communication / NMT") **Pressing the ↵ button** **Line 3:** T_max: Maximum time for processing the CAN messges per cycle, since switch-on TErr: Transmit buffer - error counter
Bus Info 2- - - - - - - - 15 V_CAN: + 0mm/s Contr.:Disable Volt. Status:Sw. On Disab.	**Page 15: Bus Info 2** Active in velocity mode **Line 2:** V_CAN: Speed, sent from the control system to the ZAdynpro **Line 3:** Contr. Control-byte. Shows commands which are sent by the control system **Line 4:** Status: Status byte. Shows the CAN statuses of the ZAdynpro
Bus Info 2- - - - - - - - 15 S_CAN + 0mm Contr.:Disab. Volt. Status:Sw.On Disab.	**Page 15: Bus Info 2** Active in position mode **Line 2:** S_CAN: Relative target position that is sent from the control system to the ZAdynpro **Line 3:** Contr. Control-byte. Shows commands which are sent by the control system **Line 4:** Status: Status byte. Shows the CAN statuses of the ZAdynpro **After pressing the ↵ button the display shows the maximum travel speed, sent by the control system**

<table>
<tr><td>Bus Info 3--------- 16
Err act. Last:No Err
Rec Tra Warn Pas off
0 0 0 0 0</td><td colspan="3">Page 16: Bus Info 3
Information about telegram errors in CANopen lift operation
Line 2 (from left to right):
Error status
Load: Fault which last occurred</td></tr>
<tr><td></td><td></td><td>Displayed text:</td><td>Meaning</td></tr>
<tr><td></td><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></td><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>
<tr><td></td><td colspan="3">Line 3 and 4:
Rec: Number of receive errors
Tra: Number of transmit errors
Warn: Indication of how often the ZAdynpro switched to the warning status
Pas: Indication of how often the ZAdynpro switched to the error passive status
off: Indication of how often the ZAdynpro switched to the bus off status</td></tr>
<tr><td>Bus Info 4--------- 17
AbsEncmm: 5358
MotEncmm:+ 4169
Offs:13081A/M 1.28</td><td colspan="3">Page 17: Bus Info 4
Calibration
Lines 2 - 4:
For calibrating the distances which were sent by the rotary encoder and the shaft encoder.</td></tr>
<tr><td>A+R ---------- 18
0.62 0.62 m/s3
0.50 0.50 m/s2
0.62 0.50m/s3</td><td colspan="3">Page 18: A&R
Display of configured values for:
• Acceleration
• Rampdown time
dependent on the operating curve of a normal ride
Line 2:
Upper rounding of the acceleration in m/s^3
Upper rounding of deceleration in m/s^3
Line 3:
Acceleration in m/s^2
delay in m/s^2
Line 4:
Lower rounding of acceleration in m/s^3
Lower rounding of the deceleration in m/s^3</td></tr>
</table>

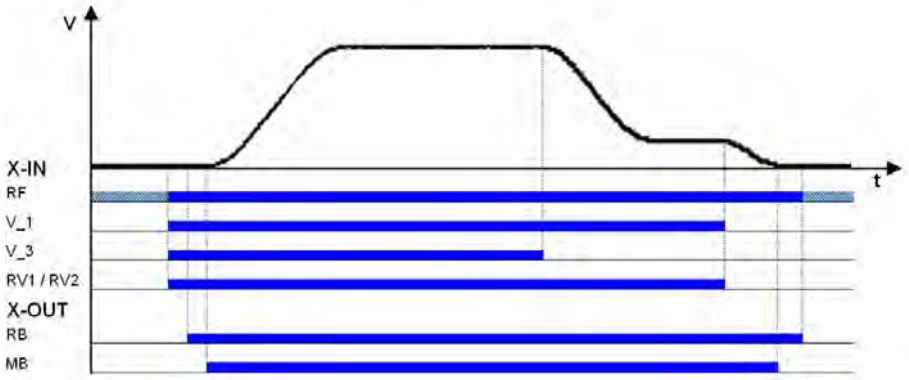
	**Page 19: Energy** **Line 2:** Power: current frequency inverter power in watts **Line 3:** Work: Energy meter. Indication of the work performed in watt hours. **Line 4:** Energy meter, specification of generated work in watt-hours
	**Page 20: InfoBus** Display of frequency inverter configuration **Line 2:** Ident no. of the internal assemblies 0: Controller Unit (CU) 1: Shunt module (CUSH) 2: reserved 3: reserved 4: ZAdyn 040-074: reserved ZAdyn 110-220: Sensor module (SM) 5: ZAdyn 040-074: Switching Power Print (SP) ZAdyn 110-220: Master Print (MP) 6: ZAdyn 040-074: Power Unit (PU) ZAdyn 110-220: Thyristor Control (TC) 7: ZAdyn 040-074: DC-Link (DC) ZAdyn 110-220: IGBT-Drive Phase U (ID) 8: IGBT-Drive Phase V (ID2) 9: IGBT-Drive Phase W (ID3) A: IGBT-Drive BR (ID4) B: MASH **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." **Line 4:** Error allocation of the assembly 1: No answer 2: Incorrect or unknown object 3: No proper EEPROM connection 4: No or unknown part number 5: No or unknown index 6: Original and backup copy are not identical During flawless operation, all internal assemblies must be displayed with a "0"

Travel direction- - - 21 TD_SET 1.000.000 TD_CNT 874.891 TD_DRV 1.364.832	**Page 21: Travel direction** Display the direction changes **Line 2:** TD_SET: Initial value of the down counter **Line 3:** TD_CNT: Travel direction counter, resettable. Indicates the change of direction still possible with the current suspension means. After resetting the travel direction counter, TD_RES will be increased **Line 4:** TD_DRV: Total counter of the travel direction changes. Value remains after resetting the down counter
Travel direction- - - 21 TD_RES 10 TD_CNT 874.891 TD_DRV 1.364.832	**Page 21: Travel direction** While pressing the ↵ button, **line 2** shows the actual number of counter resets "TD_RES".
ASM_ID - - - - - - - - - - 22 1530rpm 23.3A 9.5A 53.1Hz 338V 168ms 0.83cos <GOOD 1.2>	**Page 22: ASM_ID** **Line 2:** Determined motor speed Determined motor current Determined magnetisation current **Line 3:** Determined frequency Determined motor voltage Determined rotor time constant **Line 4:** Determined cos phi Status text, factor by which the original values have been corrected
ASM_ID - - - - - - - - - - 22 1530rpm 23.3A 9.5A 53.1Hz 338V 168ms 0.83cos 12345Ams	With ↵ key pressed: **Line 4:** Determined cos phi Magnetisation current x rotor time constant
Cuec - - - - - - - - - - - 23 Func: DCP & CAN & AN Stat: GRN	**Page 23: CUEC** Expansion board "Control" **Line 2:** Func: Functions of the expansion board "Control" **Line 4:** Stat: LED status of the expansion board "Control"

8 Travel options

8.1 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 High travelling speed
RV1 / RV2 Direction
RB Controller ready
MB_Brake Mechanical brake

8.2 Start-up and acceleration

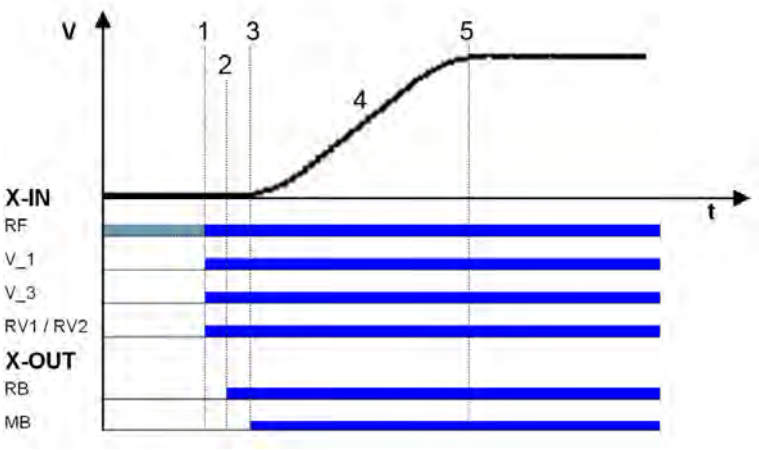
To be able to travel, the ZAdynpro requires at least the following input signals:

- Controller enable (RF)
- Speed (V_1, V_2 or V_3)
- Travel direction (RV1 or RV2)

8.2.1 Acceleration - default

Start-up procedure with default acceleration

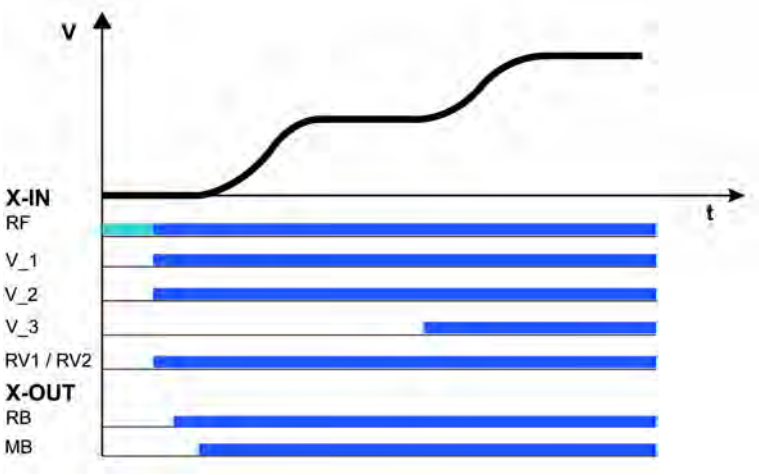
1	The elevator control system triggers the following frequency inverter inputs: • Controller enable (RF), can already be triggered • Speed V_1 and V_3 • Direction of travel RV1
2	The frequency inverter switches the digital "RB" contactor output with a time delay. With this signal, the inputs of the STO function must be activated immediately ("1" signal) or motor contactors energized.
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.



Starting with default acceleration
RF Controller enable
V_1 Positioning speed
V_3 High travelling speed
RV1 / RV2 Direction
RB Controller ready
MB_Brake Mechanical brake

8.2.2 Acceleration with intermediate speed

It is possible to accelerate to different intermediate speeds when starting.



Starting with acceleration from V_1 to V_2

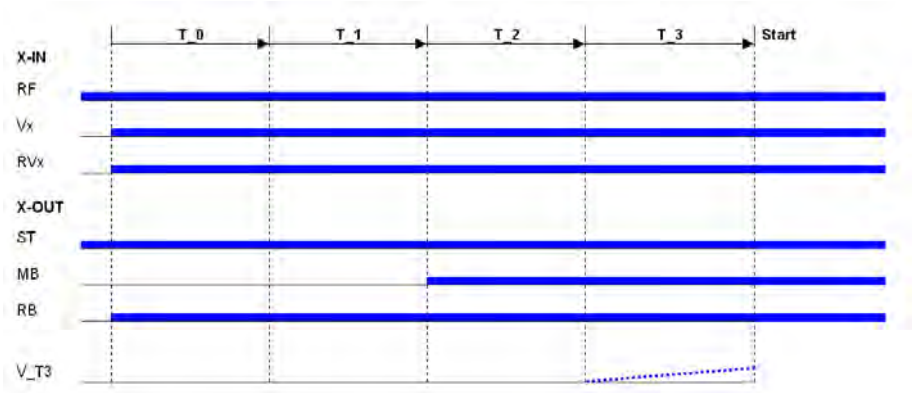
8.3 Optimizing start up behavior

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 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
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.

8.3.1 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).

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

```
Commissioning
↳M_START 1
  ↳      3
Start control procedure
```

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

A

MOD1 (default setting for asynchronous motors).
The drive is speed-controlled. Up to the end of T_2, the speed is maintained at nominal value = 0. A change in position of the shaft is not corrected. The parameter "K_START" is used to increase the speed controller amplification. It is activated at the start of T_1 and deactivated at the end of T_2

MOD2
Corresponds to the MOD5 function. The parameter "s_start" is activated additionally. If the drive position changes during the time T_2 by the value entered in "s_start", "K_START" is switched off. This prevents the drive from being damaged by too high a value of "K_START".

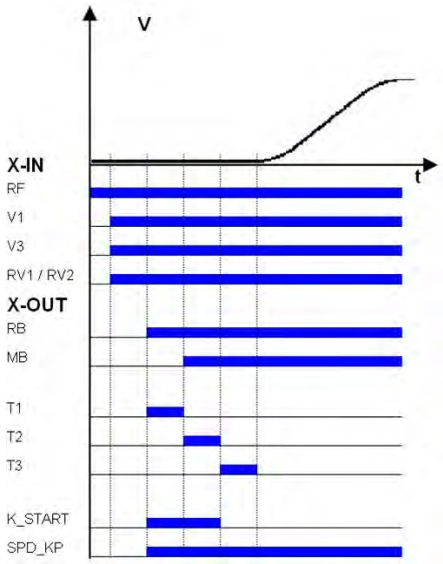
MOD3
The drive is position- and speed-controlled. Please note that both controls are set via "K_START" and are therefore dependent on one another. The position and speed control is activated at the start of T_1 and deactivated at the end of T_2.

S

MOD5 (standard setting for synchronous motors)
The drive is position-controlled. Up to the end of T_2, the drive position is recorded and corrected if there is a change. The parameter "K_START" is the position controller amplification. It is activated at the start of T_1 and deactivated at the end of T_2.

MOD4
Corresponds to the MOD5 function. The parameter "s_start" is activated additionally. If the drive position changes during the time T_2 by the value entered in "s_start", "K_START" is switched off. This prevents the drive from being damaged by too high a value of "K_START".

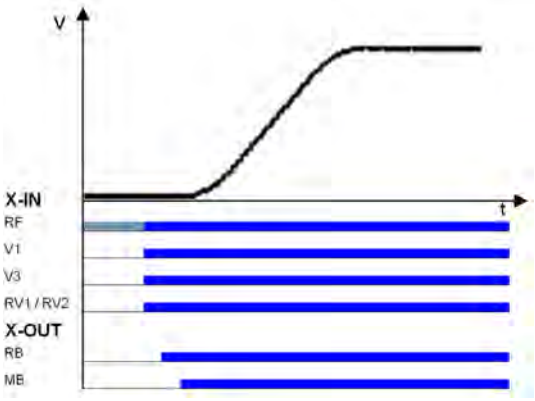
Start-up variations



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

8.4 Optimizing the acceleration

The acceleration ramp 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 High travelling speed
RV1 / RV2 Direction
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 inputs of the STO function must be activated immediately with the digital output "RB" ("1" signal) or motor contactors energized
- The brakes must be switched instantaneously with the digital output "MB"

8.5 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

8.6 Distance-dependent delay

In a path-dependent deceleration, the deceleration paths are always identical. Independent of the speed reached at the start of the deceleration.

The distance-dependent deceleration is configured using the **DECELERATION/S_ABH** parameter.

All decelerations from higher to lower speeds are dependent on the distance.

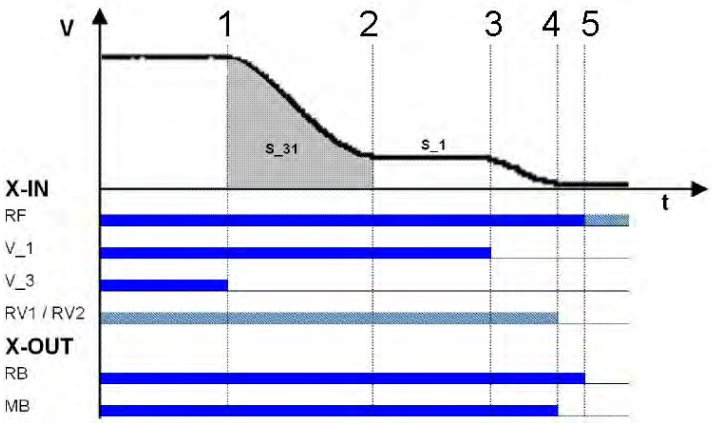
Information
Before removing the digital input for the travel speeds V_3 or V_2 the input for the travel speed V_1 must be applied (see diagram "Normal stop at distance-dependent deceleration").
If it is not possible to control two travelling speeds simultaneously for technical reasons (e.g. control of 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.

8.6.1 Distance-dependent deceleration - default

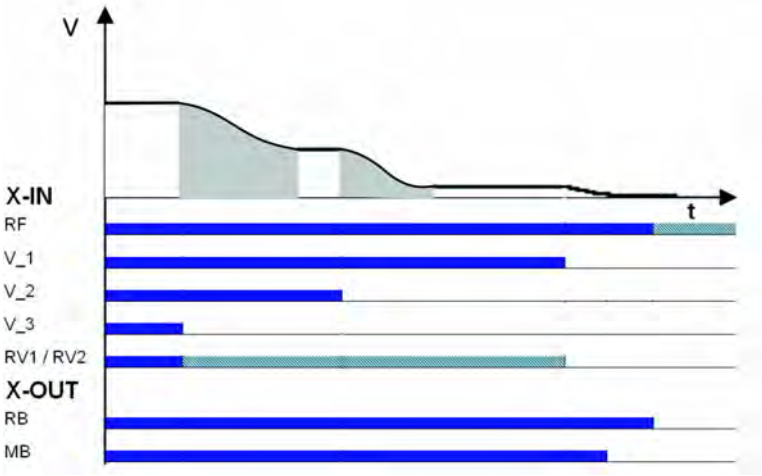
1	When the switch off point for the traveling speed is reached, the configured final speed V_3 has been reached. Deceleration is initiated
2	Travel at positioning speed V_1.
3	Positioning speed V_1 is switched off. Motor continues to decelerate.
4	Speed 0 Output MB is switched off Brake must operate immediately The motor continues to be fed with current
5	The current to the motor is switched off Output RB is switched off The inputs of the STO function must be deactivated immediately ("0" signal) or motor contactors de-energized.



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

8.6.2 Distance-dependent deceleration with intermediate speed

It is possible to also decelerate from V_3 to V_2 when stopping with distance-dependent deceleration.

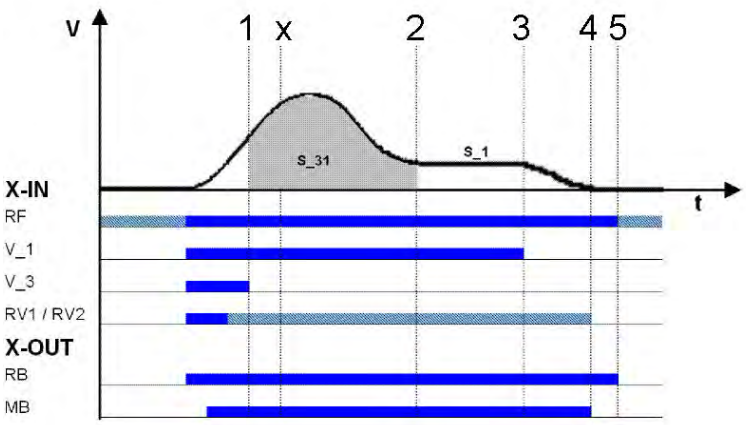


Normal stop with distance-dependent deceleration and deceleration from V_3 to V_2.
RF Controller enable
V_1 Positioning speed
V_2 Intermediate speed
V_3 High travelling speed
RV1 / RV2 Direction
RB Controller ready
MB_Brake Mechanical brake

8.6.3 Arch travel with distance-dependent deceleration

If the distance between the floors is short and the selected end speed (V_2 or V_3) is not achieved, the ZAdynpro will perform an arch travel profile journey. The arch travel profile journey means that the same creep paths are always achieved regardless of the speed reached at the switch-off time.

1	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
2	Travel at positioning speed V_1.
3	Positioning speed V_1 is switched off. Motor continues to decelerate.
4	Speed 0 Output MB is switched off Brake must operate immediately The motor continues to be fed with current
5	The current to the motor is switched off Output RB is switched off The inputs of the STO function must be deactivated immediately ("0" signal) or motor contactors de-energized.



Arch travel
RF Controller enable
V_1 Positioning speed
V_3 High travelling speed
RV1 / RV2 Direction
RB Controller ready
MB_Brake Mechanical brake

That means that during a normal trip and during arch travel, the deceleration path V3 ◦ V1 (S_31) and the creep path V1 ◦ speed 0 (S_1, only with DCP 1/DCP 3) are identical.

8.7 Time-dependent deceleration

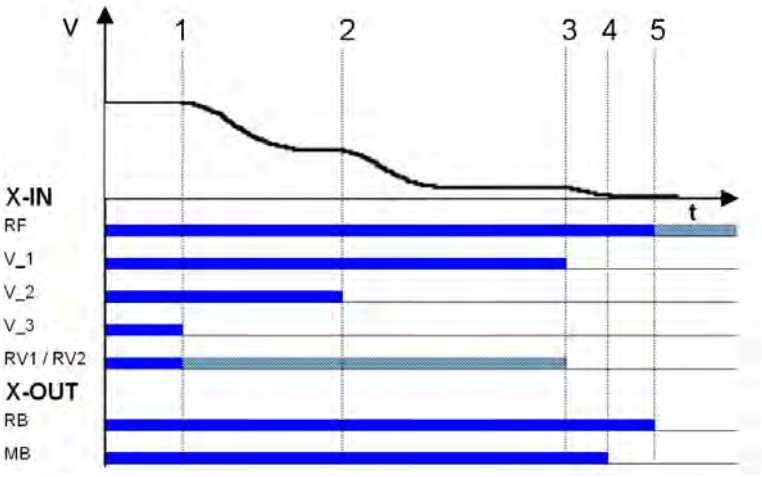
Time-dependent deceleration is activated for all speed transitions if the menu **Decelerating/S_ABH = OFF**.

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.

8.7.1 Deceleration with reached traveling speed

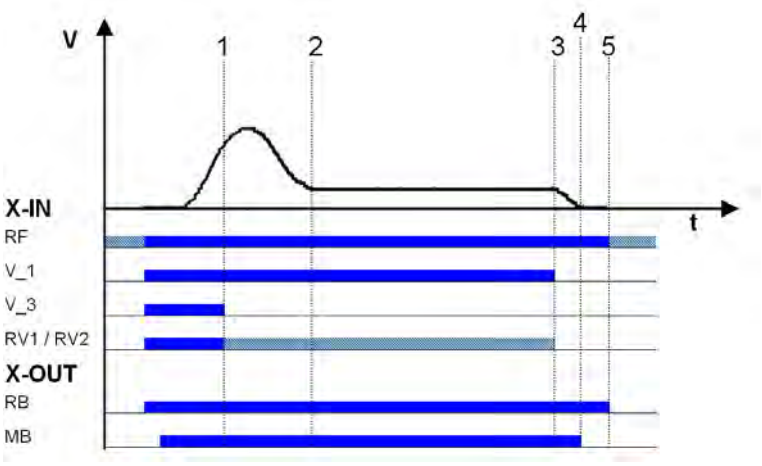
1	When the switch off point for the traveling speed is reached, the configured final speed V_3 has been reached. Deceleration to V_2 is initiated
2	Switch off point for V_2 Deceleration to V_1 is initiated
3	Positioning speed V_1 is switched off. Motor continues to decelerate.
4	Speed 0 Output MB is switched off Brake must operate immediately The motor continues to be fed with current
5	The current to the motor is switched off Output RB is switched off The inputs of the STO function must be deactivated immediately ("0" signal) or motor contactors de-energized.



Time-dependent deceleration with reached traveling speed
RF Controller enable
V_1 Positioning speed
V_2 Intermediate speed
V_3 High travelling speed
RV1 / RV2 Direction
RB Controller ready
MB_Brake Mechanical brake

8.7.2 Deceleration when traveling speed has not been reached

1	When the switch off point for the traveling speed is reached, the configured final speed V_3 is not reached. Deceleration is initiated
2	Travel at positioning speed V_1.
3	Positioning speed V_1 is switched off. Motor continues to decelerate.
4	Speed 0 Output MB is switched off Brake must operate immediately The motor continues to be fed with current
5	The current to the motor is switched off Output RB is switched off The inputs of the STO function must be deactivated immediately ("0" signal) or motor contactors de-energized.



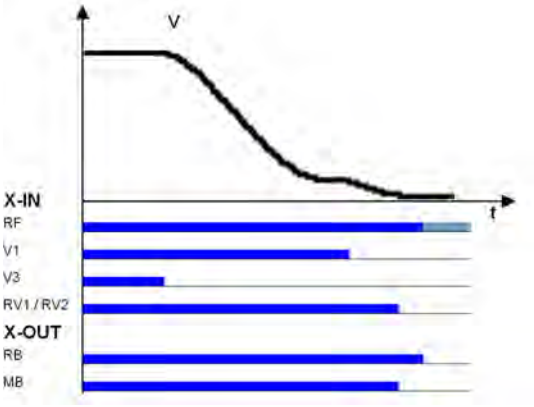
Deceleration when traveling speed has not been reached
RF Controller enable
V_1 Positioning speed
V_3 High travelling speed
RV1 / RV2 Direction
RB Controller ready
MB_Brake Mechanical brake

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.

8.8 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 High travelling speed
RV1 / RV2 Direction
RB Controller ready
MB_Brake Mechanical brake

A_NEG: Deceleration preset in m/s². 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 ◦ V_1. The recalculated path is shown in the display. If necessary, correspondingly adapt the interrupt point for V_3.

8.9 Creep path optimization

Improvement of:

- Too long creep paths with travelling speed V_1
- non-flush stopping due to V_1 being prematurely switched off

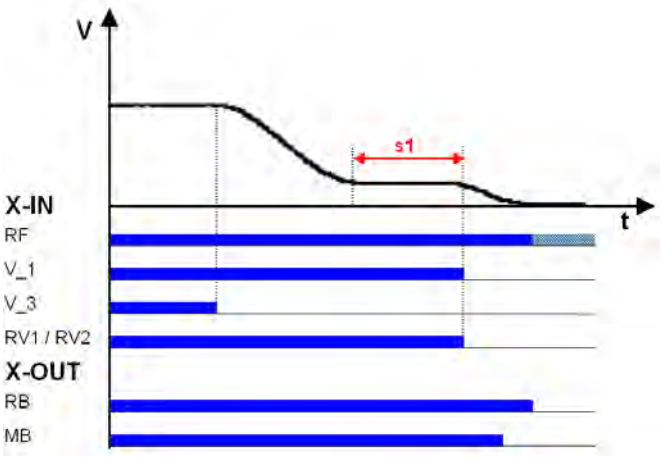
without additional installation work.

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

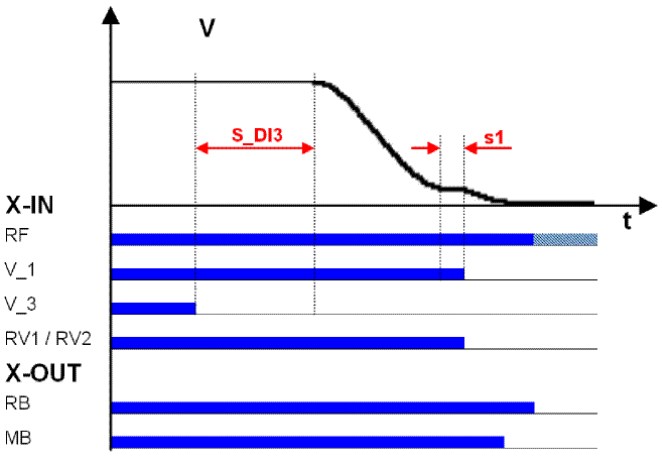
Optimizing the crawl paths

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

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



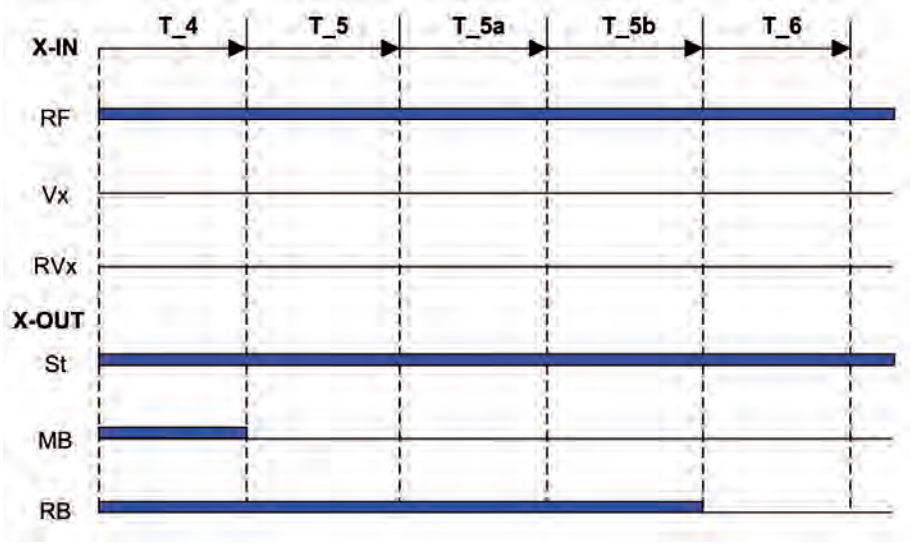
Deceleration with non-optimized crawl path
RF Controller enable
V_1 Positioning speed
V_3 High travelling speed
RV1 / RV2 Direction
RB Controller ready
MB_Brake Mechanical brake



Deceleration with optimized crawl path
RF Controller enable
V_1 Positioning speed
V_3 High travelling speed
RV1 / RV2 Direction
RB Controller ready
MB_Brake Mechanical brake

8.10 Optimizing stopping

Stopping time sequence



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

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

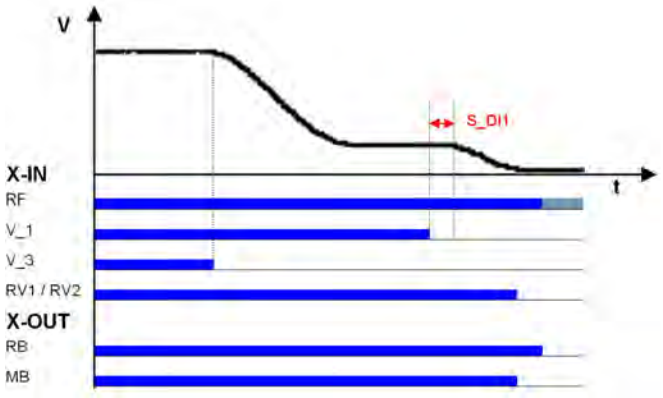
Time optimization through brake monitoring
If the brake monitoring is activated (menu **Monitoring/BR≠Off**) and the monitor contacts are connected, time T_5 is optimized. As soon as the brakes are closed, time T_5 is aborted and time T_5b started.

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.

8.11 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"!

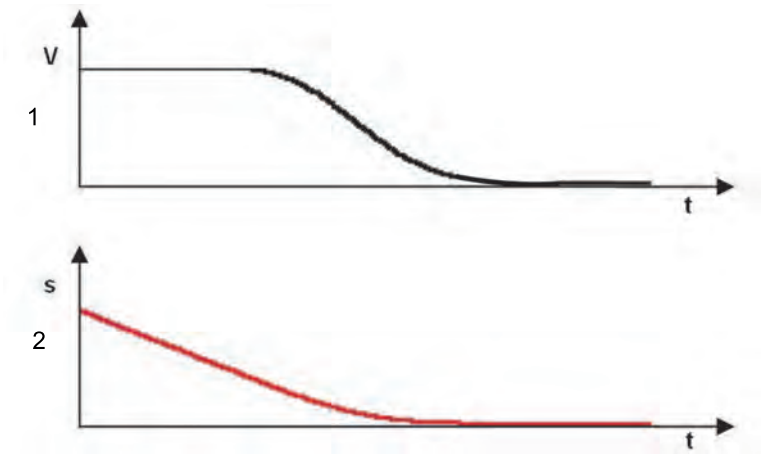


Optimizing the step alignment
RF Controller enable
V_1 Positioning speed
V_3 High travelling speed
RV1 / RV2 Direction
RB Controller ready
MB_Brake Mechanical brake

8.12 Direct levelling

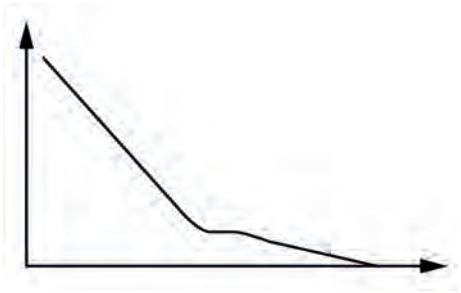
Information
Direct engagement is only possible when using the DCP2, the DCP4 or the CANopen lift protocol in position mode and an absolute shaft copy.

With direct engagement, the control system indicates to the ZAdynpro the remaining distance to be travelled up to the stopping point. The frequency inverter slows down the motor in accordance with the specified remaining distance. This makes it possible to enter the stopping point without a creep path. Direct engagement enables intermediate speeds to be actuated.



Direct leveling with DCP protocol
1 travel speed
2 Residual distance

If the **Deceleration/S_ABH=Slow** parameter is configured, landing takes place with an early reduction in the levelling speed.



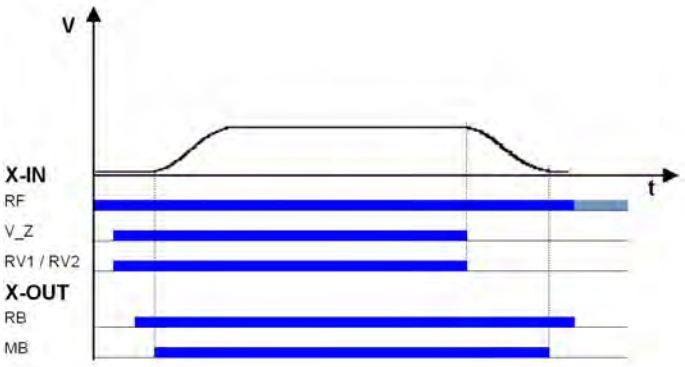
8.13 Readjustment

Correction of the strain on the suspension means when loading and unloading the cabin. The cable extension is evaluated by the control.
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

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



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

8.14 Operation in idle

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

CAUTION!

Danger

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%**.

```
Controller
↳ SPD_KP  1.00
  ↳       0.10
Base gain-factor
```

8.15 Quickstart

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 EN 81-20 must be observed.

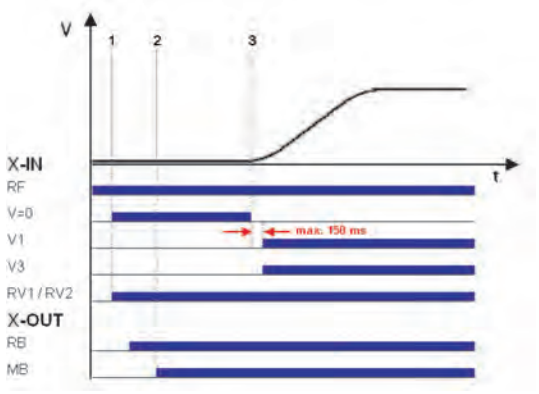
8.15.1 Actuation

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

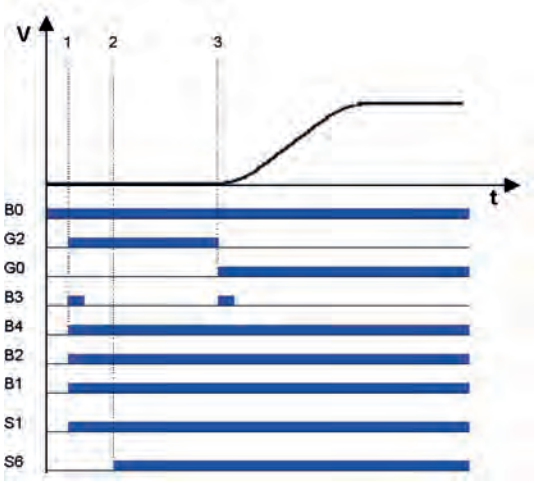
```
Control
↳ f_I08   v=0
  ↳       v=0
Function I08
```

	Standard	DCP	CANopenLift
1	Cabin door closing Actuation of inputs: • RF - Controller enable • RVx - Default for travel direction • v=0 - Hold speed 0 Activation of output: • RB - Controller ready The inputs of the STO function must be activated immediately ("1" signal) or motor contactors energized Motor energized	Cabin door closing Setting the bits by lift control: • G2 - RPM 0 • B1 – travel command • B2 – off switch • B3 – travelling speed • B4 – travel direction Setting the bits by ZAdynpro • S1 – travel active The inputs of the STO function must be activated immediately ("1" signal) or motor contactors energized Motor energized	Cabin door closing Travel sequence via control word from control according to CiA specification 417, travel command as follows: • Enable Voltage • Disable Operation • Target speed v=0 The inputs of the STO function must be activated immediately ("1" signal) or motor contactors energized Motor energized
2	Activation of output: • MB – mechanical brake Motor brake must be opened without a delay. Motor speed is controlled to 0.	Setting the bits by ZAdynpro • S6 - mechanical brake Motor brake must be opened without a delay. Motor speed is controlled to 0.	Control opens the brake with "Enable Operation" Motor brake must be opened without a delay. Motor speed is controlled to 0.
3	Cabin door is closed Deactivation of input: • v=0 - Hold speed 0 Actuation of inputs: • V1 - Positioning speed or • V2 - Intermediate speed or • V3 - travel speed Travel speeds must be actuated no more than 150 ms after input "v=0" has been deactivated!	Cabin door is closed Setting the bits by lift control: • G6 - Intermediate speed or • G7 – fast speed • B3 – travelling speed Cancelling the bits by lift control: • G2 - RPM 0 Travel speeds must be actuated no more than 150 ms after input "v=0" has been deactivated!	Cabin door is closed • Brake is monitored by control: Brake must be open • Target speed set by control Travel speeds must be actuated no more than 150 ms after input "v=0" has been deactivated!

Danger
Danger from traveling with cabin door open!
To prevent premature starting in the event of a defective input, a fractured wire or an incorrect telegram via CANopenLift or DCP for the "Stop speed 0" function, the travelling speed signals should only be connected after deactivation of the "Stop speed 0" function.



Quickstart with standard actuation
RF Controller enable
v=0 Hold speed 0
V1 Positioning speed
V3 travel speed
RV1 / RV2 Direction
RB Controller ready
MB_Brake Mechanical brake



Quick start with DCP actuation
B0 Converter enable
B1 Travel command
B2 Off switch
B3 travel speed
B4 Direction
S1 Travel active
S6 Mechanical brake
G2 Speed 0
G7 High speed

8.15.2 Monitoring functions for Quickstart

- If the drive is held at a speed of 0 for longer than 20 s the frequency inverter enters failure mode and displays the error **ERR780/Quickstart > 20s**
- If the input signal "hold 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 ZAdynpro 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

9 Calibration of absolute rotary encoders

9.1 General

CAUTION!

Danger

S

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!
Travelling is prohibited before absolute rotary encoder calibration has been performed!

Information

In Ziehl-Abegg motors, the absolute rotary encoder is already aligned in the factory to the offset value "0".
It is no longer necessary to perform absolute rotary encoder calibration!

Options for calibrating an absolute encoder

The ZAdyn4C has two different methods of calibrating the absolute value encoder:

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

General conditions for rotary encoder calibration without load:

- The installation and motor data must be configured
- Load-free operation, suspension means must be removed from the traction sheave
- Brake monitor must be activated in accordance with the number of brakes in use (**Monitors/BR** 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 rotary encoder calibration (disconnect brake)
- Brake monitor must be activated in accordance with the number of brakes in use (**Monitors/BR** menu)

9.1.1 Load-free alignment SSI-Encoder

While the SSI encoder is being calibrated, the ZAdynpro 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 ZAdynpro prior to assembly and calibrate the offset value "0" (value in the **ENCODER calibration/ENC_POS**). Subsequently mount the SSI encoder, if possible without any twisting, in the position in which the locking screw is easily accessible.

1.	Select menu **Encoder adjustment**	`MMC recorder`
		`-> Encoder-adjust.`
		`Safety gear`
		`HW-Ident.`

2.	Select parameter **"ENC_ADJ"**
	Switch on encoder adjustment with "ENC_ADJ=No load".
		`Encoder alignment!`
		`↳ENC_ADJ OFF`
		`↳ No load`
		`Encoder Position`

3.	Confirm with the ↵ key.	`Are you sure?`
		
		`[No] [Yes]`

4.	Query as to whether the drive is in a load-free condition.
	
	Press the ESC key to cancel rotary encoder adjustment.
	Press the ↵ key to continue rotary encoder adjustment.
		`Brakes will be opened`
		`without any torque!`
		`Is the motor load-free?`
		`[Esc] [Yes]`

5.	Keep the inspection run push-button pressed.
	
	Performing rotary encoder adjustment.
		`Inspection starting`
		`Encoder alignment!`
		
		`[Esc]`

6.	Adjust the rotary encoder as precisely as possible to the value **0 °** and carefully fasten the clamping screw, correcting the encoder position if necessary. At the end of the adjustment procedure, the rotary encoder must be securely tightened and the value close to **0**. With deviations of less than ± 2.00 ° the adjustment is classed as correct. A deviation of max. ± 1 ° is recommended.
	
	Line 2:
	Current offset value
	
	Once the rotary encoder has been adjusted, confirm with the ↵ key.
		`Set offset to zero mechan-`
		`mechanically`
		`30°`
		`[Esc] [Done]`

7.	The ZAdyn checks whether the deviation is less than ± 2.00 °.	

	Deviation less than ± 2.00 °:	**Deviation greater than or equal to ± 2.00 °:**

8.	`Encoder adjusted success-`
	`successfully`
	
	`[OK]`
		`Encoder offset incorrect`
		
		`[OK]`

9.	↵ Press the key.	↵ Press the key.
10.	`Stop Inspection!`	`Stop Inspection!`
11.	Release inspection run push-button.	Release inspection run push-button.

12.	`Process successfully completed [OK]`	`An error occurred while processing [OK]`
13.	Confirm with the ↵ key.	↵ Press the key.

9.1.2 Load-free alignment EnDat-Encoder

While the EnDat encoder is being calibrated, the ZAdynpro 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".

1.	Select menu **Encoder adjustment**	`MMC recorder -> Encoder-adjust. Safety gear HW-Ident.`
2.	Select parameter **"ENC_ADJ"** Switch on encoder adjustment with "ENC_ADJ=No load".	`Encoder alignment! ↳ENC_ADJ OFF ↳ No load Encoder Position`
3.	Confirm with the ↵ key.	`Are you sure? [No] [Yes]`
4.	Query as to whether the drive is in a load-free condition. Press the esc key to cancel rotary encoder adjustment. Press the ↵ key to continue rotary encoder adjustment.	`Brakes will be opened without any torque! Is the motor load-free? [Esc] [Yes]`
5.	Keep the inspection run push-button pressed.	`Inspection starting Encoder alignment! [Esc]`
6.	Performing rotary encoder adjustment.	`Encoder adjust running, please wait...`
7.	Release inspection run push-button.	`Stop Inspection!`
8.	Confirm with the ↵ key.	`Process successfully completed [OK]`

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

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

Information
The offset determined during the check is not saved in the ZAdynpro.

Information
During the rotary encoder calibration, the driving disc must turn to the right (when looking at the driving disc). Once the rotary encoder calibration is complete, the driving disc 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**.

1.	Select menu **Encoder adjustment**	MMC recorder -> Encoder-adjust. Safety Brake HW-Ident.
2.	Select parameter **"ENC_ADJ"** Switch on encoder adjustment with "ENC_ADJ=Check"	Encoder alignment! ↳ ENC_ADJ OFF ↳ Check Encoder Position
3.	Confirm with the ↵ key.	Are you sure? [No] [Yes]
4.	Query as to whether the drive is in a load-free condition. Press the esc key to cancel the inspection. Press the ↵ key to continue the inspection.	Brakes will be opened without any torque! Is the motor load-free? [Esc] [Yes]
5.	Keep the inspection run push-button pressed for approximately 2 minutes. The offset value check now runs automatically and lasts about 2 minutes.	Inspection starting Encoder alignment! [Esc]
6.	The rotor now makes a full revolution and the offset value is determined at every pole.	Running, active pole 5
7.	Release inspection run push-button.	Stop Inspection!
8.		Encoder check finished 359° [OK]

9.1.4 Rotary encoder calibration with closed brake

If the rotary encoder is calibrated with the brake closed, it is not necessary to remove the suspension means from the traction sheave.

CAUTION!

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

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

CAUTION!

Danger
If the device is replaced, the offset needs to be entered in the new device!

1.	Select menu **Encoder adjustment**	MMC recorder -> Encoder-adjust. Safety gear HW-Ident.
2.	Select parameter **"ENC_ADJ"** Switch on encoder adjustment with "ENC_ADJ=On halt"	Encoder alignment! ↳ ENC_ADJ OFF ↳ Braked Encoder Position
3.	Confirm with the ↵ key.	Are you sure? [No] [Yes]
4.	Query as to whether the electrical connection for the brake is disconnected. Press the esc key to cancel rotary encoder adjustment. Press the ↵ key to continue rotary encoder adjustment.	Has the electrical connection for the brake been disconnecte-isconnected? [Ist der e-elektrische Anschluss der Bremse abgeklemmt?] [Esc] [Yes]
5.	Keep the inspection run push-button pressed.	Inspection starting Encoder alignment! [Esc]
6.	Performing rotary encoder adjustment. **Line 3:** Current motor current	Encoder adjust running, 1A
7.	The ZAdyn checks whether a valid offset value could be determined.	

	Valid offset value was determined:	**Valid offset value could not be determined:**
8.	Stop Inspection!	Stop Inspection!
9.	Release inspection run push-button.	Release inspection run push-button.
10.	Query whether the determined value is to be saved.	An error text is output on the ZApad display.
11.	Save determined value 198° [No] [Yes]	Confirm with the ↵ key.
12.	Press the esc key if you do not want to save the value. Press the ↵ key to save the value.	
13.	Process successfully completed [OK]	
14.	Confirm with the ↵ key.	

9.1.5 Calibration of absolute rotary encoders type ERN1387

The calibration of absolute rotary encoders of type ERN1387 corresponds to rotary encoder calibration with the brake closed.

10 Support with acceptance test

10.1 Rotary encoder test

The function uses software to simulate rotary encoder failure.

Information
The test function can also be activated during travel.

Performing rotary encoder test

1.	Select **Tests** menu	Power unit -> Checks ZA-Intern
2.	Select parameter **SCY_EN** **Enter SCY_EN=On**	Checks ↳ SCY_EN OFF ↳ ON Enable tests
3.	Select parameter **SCY_ENC** Switch on rotary encoder test with **SCY_ENC=ON**	Checks ↳ SCY_ENC OFF ↳ ON Encoder test
4.	Then send a travel signal. Travel is aborted with an error message, as the rotary encoder is deactivated.	

10.2 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.

10.2.1 Powerless drifting of the cabin from the floor

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

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

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

1.	Select **Tests** menu	Power unit -> Checks ZA-Intern
2.	Select parameter **SCY_EN** **Enter SCY_EN=On**	Checks ↳ SCY_EN OFF ↳ ON Enable tests
3.	Select parameter **SCY_A3** Switch on test EN81-A3 with **SCY_A3=powerless**	Checks ↳ SCY_A3 OFF ↳ Powerless A3 support
4.	Message that the brake is opened in the following trip	Attention: Drive command just opens the brake, power unit is without current!
5.	To start the test, give a travel command.	

10.2.2 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!

Danger

- 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 testing the protective device according to EN81-A3 “Travel with maximum acceleration from floor”. Ziehl-Abegg provides no guarantee for motors that do not originate from Ziehl-Abegg.

Danger!

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

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

1.	Select **Tests** menu	Power unit -> Checks ZA-Intern
2.	Select parameter **SCY_EN** **Enter SCY_EN=On**	Checks ↳ SCY_EN OFF ↳ ON Enable tests
3.	Select parameter **SCY_A3** Switch on test EN81-A3 with **SCY_A3=max. accel.**	Checks ↳ SCY_A3 OFF ↳ max. accel. A3 support
4.	Message that the cabin is accelerated to maximum	Attention: Drive command results in maximum torque, control is not active!
5.	To start the test, give a travel command.	

10.3 Capture device test

if the motor windings are shorted by a contactor(see chapter "Electrical installation/Motor connection (X 3)"), the short circuit is deactivated by the function. After switching on the function, you have to open the brakes manually.

Danger!

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

Perform capture device test

1.	Select **Tests** menu	Power unit -> Checks ZA-Intern
2.	Select parameter **SCY_EN** **Enter SCY_EN=On**	Checks ↳ SCY_EN OFF ↳ ON Enable tests
3.	Select parameter **SCY_SG** Switch on capture device test with **SCY_SG=ON**	Checks ↳ SCY_SG OFF ↳ ON Capture test
4.	Message that the electronic short-circuit is deactivated. The brakes can be opened manually.	Motor windings not shorted!

10.4 Driving capability 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.

Perform driving ability test

1.	Move up with the recovery control until the counterweight is resting on the buffer.	
2.	Select **Tests** menu	Power unit -> Checks ZA-Intern
3.	Select parameter **SCY_EN** **Enter SCY_EN=On**	Checks ↳ SCY_EN OFF ↳ ON Enable tests
4.	Select parameter **SCY_DA** Switch on driving capability test with **SCY_DA=ON**	Checks ↳ SCY_DA OFF ↳ ON Driving capability test
5.	Move up with recovery control until the suspension means slide over the traction sheave Note that the suspension means can slide over the traction sheave for a maximum period of 5 seconds. If the suspension means slide over the traction sheave over a longer period of time, the suspension means may be damaged.	
6.	Display cabin movement	Difference in cabin posi-position + 13mm

10.5 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

1.	Select **Tests** menu	Power unit -> Checks ZA-Intern
2.	Select parameter **SCY_EN** **Enter SCY_EN=On**	Checks ↳ SCY_EN OFF ↳ ON Enable tests
3.	Select parameter **SCY_MB** Switch on motor brakes test with **SCY_MB=ON**	Checks ↳ SCY_MB OFF ↳ ON Engine brakes test
4.	Give travel command up with empty cabin Interrupt safety chain	
5.	Display distance up to standstill	Difference in cabin posi- position + 13mm

11 Electronic name plate

With the "Electronic rating plate" function, you can save parameters from the ZAdynpro in an absolute value encoder or load data from an absolute value encoder into the ZAdynpro. The function is possible in rotary encoders with EnDat interfaces.

11.1 Save data

1.	Select menu **Encoder calibration**	MMC recorder -> Encoder-adjust. Safety gear HW-Ident.
2.	Select parameter **SAV_P_E** **Enter SAV_P_E=On**	Encoder alignment! ↳ SAV_P_E OFF ↳ ON Parameters on encoder

11.2 Load data

In order to be able to load data from the absolute value encoder, you must have stored the data in the absolute value encoder with the ZAdynpro first.		
1.	Select menu **Encoder calibration**	MMC recorder -> Encoder-adjust. Safety gear HW-Ident.
2.	Select parameter **LOD_P_E** **Enter LOD_P_E=27** to load data	Encoder alignment! ↳ LOD_P_E OFF ↳ 27 Parameters from encoder

12 Auto tuning asynchronous motors

12.1 General

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 are determined with the Autotune function.

The Autotune function can also be performed using the ZAmonMobile app.

Laden im App Store	JETZT BEI Google Play

12.2 Determining the operating data with the Autotune function

- The autotune function must be carried out at a motor temperature <40 ° C.
- Before starting the auto tuning, move the empty cabin to the top stop. Correct connection of the rotary encoder and correct connection of the motor (in phase) is a prerequisite for correct functioning.

If the weight balancing is 40 %, there is not sufficient reserve to move the elevator with nominal load at nominal speed when performing the auto tune function, which assumes 50 % weight. There are several possible ways to prevent this:

- Reduce the **Motor name plate/U_Trim** parameter to 300-310 V. This frees up reserves for travelling with nominal load.

Step 1	Enter parameters in menu **Installation**.
	• V* = 90 % of nominal speed of the lift • MOD_n* = calculate • n* = Calculated automatically • __D = diameter of the traction sheave • __iS = suspension • __i1 = i1 of the gear ratio i1:i2 • __i2 = i2 of the gear ratio i1:i2
Step 2	Enter the parameters in the **Travel** menu.
	• V_3 = V* (nominal speed of the installation) In CANopen lift operation, this speed has to be configured in the control.
Step 3	First of all the value that has to be entered for the **Motor name plate/f** parameter has to be calculated. This is done by carrying out the following steps 1-3. 1. Calculation of the number of pole pairs using the data on the name plate: p = f x 60 / n 2. Calculation of the nominal frequency using the value of n* calculated in step 1 of the auto tune function and the calculated number of pole pairs. Use the integer proportion for p: f = n* x p / 60 3. Add 1.5 Hz to the calculated nominal frequency value: f = f + 1.5 Hz Enter the calculated value for the **Motor name plate/f** parameter.
	Enter the following additional parameters in the **Motor name plate** menu.
	• n =n* -> calculated motor speed n* • I = Motor name plate specification (if not specified: I[A]= Power [kW] x 2) • cos phi = specification of motor nameplate (if there is no specification: cos phi= 0,88)
Step 4	Travel **down** with empty cabin at inspection speed. If the drive does not start or travel is aborted with an error message, in the **Motor nameplate** menu increase the nominal frequency for the **f** parameter in 1 Hz increases until the elevator travels down.

Step 5	Drive the cabin to the top floor.

Step 6	In the **Motor nameplate** menu, set the parameter **ASM_ID =One-Step**.
	-> After confirmation, the display changes to the Info menu 22
	`ASM_ID - - - - - - - - - - 22`
	`1420rpm 19.7A 9.6A`
	`50.5Hz 340V 278ms`
	`0.76cos <WAIT >`

Step 7	Give a call to the bottom floor.
Step 8	At the end of travel, one of the following displays appears:

	`Good, Factor x.x - - -`
	`Accept values determined?`
	`[No] [Yes]`
	The operating data was determined correctly.
	x.x specifies the factor, by which the original values were corrected, e.g. "1.2".
	if the ↩ key is pressed, the data are saved automatically. The process is finished then.

	`U:LIMIT - - - - - - - - - -` Determination of the operating data was not completed correctly because the voltage limit of the ZAdyn was reached. The **Motor nameplate/U_TRIM** parameter must be set to a lower value. The parameter is only visible if the **Motor nameplate/ASM_ID=ON** parameter is configured. Steps 1-8 must be repeated.
	`f:LIMIT - - - - - - - - - -` The operating data could not be determined correctly, as the slip limit was reached. The slip limit must be increased in the **Motor nameplate/f_SLIP** parameter. To do this, the **Motor nameplate/f_SLIP=15 Hz** parameter has to be configured. The parameter is only visible if the **Motor nameplate/ASM_ID=ON** parameter is configured. Steps 1-8 must be repeated.

Increase in the nominal system speed to 100 %

This is carried out in two stages: First, the system nominal speed is set to 95 % and steps 1-6 are carried out. If the data could be determined correctly, the system nominal speed is set to 100 % and steps 1-6 are repeated.

Step 1	Adjust parameters in menu **Installation**.
	• V* = 95 % of nominal speed of the lift • n* = is calculated automatically (expected value ca. 1425 min^{1})
	Enter the parameters in the **Travel** menu.
	• V_3 = V* (nominal speed of the installation) In CANopen lift operation, this speed has to be configured in the control.
Step 2	Adjust parameters in the **Motor nameplate** menu.
	• n =n* -> calculated motor speed n*
Step 3	In the **Motor nameplate** menu, set the parameter **ASM_ID =One-Step**.

	-> After confirmation, the display changes to the Info menu 22
	`ASM_ID - - - - - - - - - - 22`
	`1420rpm 19.7A 9.6A`
	`50.5Hz 340V 278ms`
	`0.76cos <WAIT >`

Step 4	Drive the cabin to the top floor.
Step 5	Give a call to the bottom floor.
Step 6	At the end of travel, one of the following displays appears:

```
 Good, Factor x.x - - -
Accept values determined?
[No] [Yes]
```

The operating data was determined correctly.
x.x specifies the factor, by which the original values were corrected, e.g. "1.2".
if the ↵ key is pressed, the data are saved automatically. The process is finished then.
If the data could not be determined correctly, the **page 22** of the **Info menu** is displayed.

```
U:LIMIT - - - - - - - - - -
```

Determination of the operating data was not completed correctly because the voltage limit of the ZAdyn was reached. The **Motor nameplate/U_TRIM** parameter must be set to a lower value. The parameter is only visible if the **Motor nameplate/ASM_ID=ON** parameter is configured. Steps 1-6 must be repeated.

```
f:LIMIT - - - - - - - - - -
```

The operating data could not be determined correctly, as the slip limit was reached. The slip limit must be increased in the **Motor nameplate/f_SLIP** parameter. To do this, the **Motor nameplate/f_SLIP=15 Hz** parameter has to be configured. The parameter is only visible if the **Motor nameplate/ASM_ID=ON** parameter is configured. Steps 1- 6 must be repeated.

13 Special functions

13.1 Changing the switching frequency

The factory setting of the ZAdynpro's switching frequency depends on the size and the motor type:

Size	Synchronous motor	Asynchronous motor
ZAdynpro 011 ZAdynpro 013 ZAdynpro 017 ZAdynpro 023 ZAdynpro 032	Clock frequency 16 kHz auto (Parameter M_PWM=Auto)	Clock frequency 16 kHz auto (Parameter M_PWM=Auto)
ZAdynpro 040 ZAdynpro 050 ZAdynpro 062 ZAdynpro 074	Switching frequency 8 kHz fix (Parameter M_PWM=Fix f_PWM)	Clock frequency 16 kHz auto (Parameter M_PWM=Auto)

At a ZAdyn4C output frequency of less than 7 Hz the clock frequency is reduced to 8 kHz.

- If required, the clock frequency can be continuously changed in the **Power unit** menu between 3.7 and 16 kHz.
- The **Power unit** menu is in the advanced level. To access the advanced level, press and hold the ESC key.
- The switching frequency should only be changed after consultation with the Ziehl-Abegg hotline.

CAUTION!

Danger
Increasing the switching frequency causes
- a performance reduction of the ZAdynpro (see Technical Data chapter)
- a greater power loss and thus increased heating of the ZAdynpro

13.1.1 Fixed presetting of the switching frequency (Menu Power sectionl/M_PWM=Fix f_PWM)

The ZAdynpro works with the switching frequency configured in the **Power component/f_PWM** menu.

13.1.2 Automatic adjustment of the switching frequency (Menu Power sectionl/M_PWM=Auto)

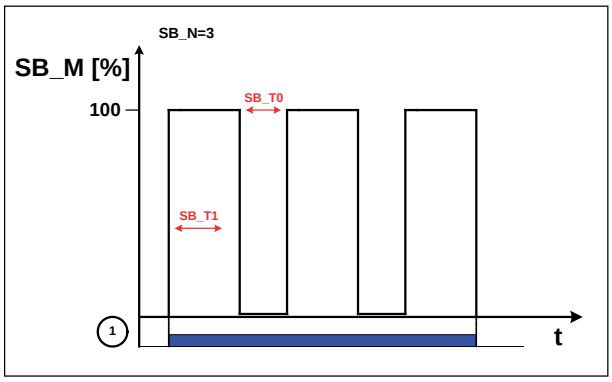
The frequency inverter works with the switching frequency configured in the **Power component/f_PWM_H** menu.
If required, the frequency inverter switches to the switching frequency configured in the **Power component/f_PWM** menu.

13.2 Safety Brake

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 safety gear.

CAUTION!

Danger
Do not repeatedly carry out the capture release, as this can destroy the ZAdynpro.



Process capture release
1 Inspection trip "UP" or "DOWN"

Carrying out the safety brake-function

1.	Select **Capture device** menu	MMC recorder -> Encoder-adjust. Safety gear HW-Ident.
2.	Select **SB_MOD** parameter Activate capture release	Safety gear ↳ SB_MOD Off ↳ On Activate freeing func- tion [Befreiungsfunktion akt]
3.	Start capture release by pressing the inspection run push-button	Safety Brake Press inspection! [esc]

	Function successful!	**Function faile!**
4.	0.0s 4.0A - - - - - - -> jerk1	Stop inspection
5.	Abort inspection run in both cases.	
6.	SB_INFO 1 [ESC]	

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

13.3 Reset

Allocating the parameters of the ZAdynpro with the standard values or customer-specific system data. The works setting is made by a numeric input in the **Statistic/RESET**menu.
Reset-functions:

Reset-No.	Effect
77	**Pre-parametrised ZAdynpro:** Parameters are assigned customer-specific system data **Standard ZAdynpro:** Parameters are assigned standard data

90	deleting of: • Parameter • Error list • Error messages Parameters will be set with standard data
99	deleting of: • Parameter • Error list • Error messages Parameters are assigned default values based on the available hardware

CAUTION!

Danger

S

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

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

CAUTION!

Attention! - Reset 90 and 99

Any pre-configuration of the ZAdynpro 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!

13.4 Checking the motor phases

To avoid undefined motor activities due to wrong connection, short circuit , broken wires, etc, the motor phases will be checked during the start procedure. Therefor the current in the phases U/V/W will be measured before the brakes are opening.

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	Designation
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

The testing voltage can be selected in the menu **ZA-Intern/UVW_PEK** an. The factory setting is "f(P)".

Function	Designation
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 correct, maybe the testing voltage is to small. The testing voltage has to be increased manually.

13.5 Field weakening

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

If the required motor speed n* for an asynchronous motor is above the nominal speed n of the motor, the ZAdynpro 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.

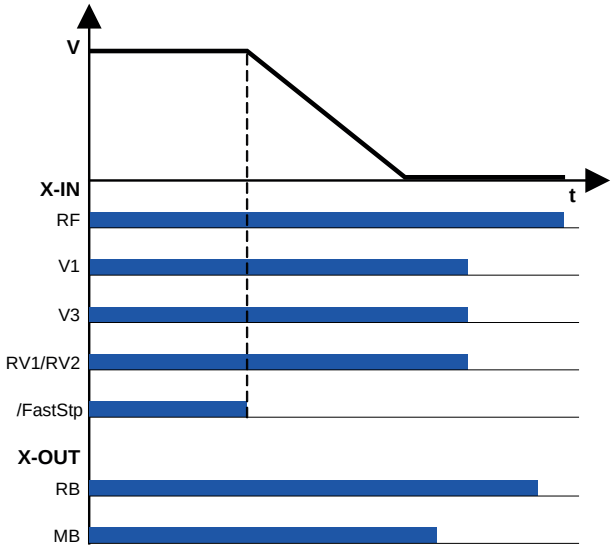
13.6 Operation with a 3-phase 230 VAC power supply

The ZAdynpro can be operated with a 3~ 230 VAC power supply.
For this purpose, it is only necessary to adapt various monitoring functions to the lower power supply.

1.	In the **Power component** menu, configure the parameter **UDC_N=325 V**	Power unit ↳UDC_N 325 V ↳ 325 Nominal DC voltage
2.	In the **Power component** menu, configure the parameter **UDC_MIN=250 V**	Power unit ↳UDC_MIN 250 V ↳ 250 Min. DC-link voltage
3.	In the **Power component** menu, configure the parameter **UDC_MAX=760 V**	Power unit ↳UDC_MAX 760 V ↳ 760 Max. DC voltage
4.	In the **Power component** menu, configure the parameter **U_BC=650 V**	Power unit ↳U_BC 650 V ↳ 650 BC intervention voltage

13.7 Controlled emergency stop in inclined elevators

If an emergency stop is implemented in inclined elevators by suddenly closing the brakes, the abrupt stop can lead to injury to passengers. To avoide this, the cabin should also be braked controlled in emergency stop.
The **/FastStp** input function is available for this purpose.
When deactivating the input using the **/FastStp** function, the motor is decelerated with the deceleration configured in the **Control/A_MAX** menu (see Fig.).



Controlled emergency stop
RF Controller enable
V1 Positioning speed
V3 High travelling speed
RV1 / RV2 Direction
/FastStp Delay in emergency stop
RB Controller ready
MB_Brake Mechanical brake

13.8 Travel direction counter

This function is a reverse counter that counts the permitted number of changes of direction and informs the operator of the elevator system in good time about necessary replacement of the suspension means.

13.8.1 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	Designation	Value range	Factory setting
TD_PWN	New password A number between 1 and 9999 can be used as a password If the password is set to 0, the direction change counter is deactivated.	0 ... 9999 0 = no password	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
TD_SET	Initial value of the down counter	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 for the direction change counter are also available in the **info menu** on the **TravelDirection** page.

13.8.2 Activating the travel direction counter

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

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

Assign a new password in the **Statistic/TD_PWN** parameter.
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 **Statistic/TD_PWC** parameter indicates the password in coded form.
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 every change to TD_SET, the previously assigned password must be entered in the **Statistic/TD_PW** parameter.

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

Enter the maximum number of changes of direction in the **Statistic/TD_SET** parameter.

Information
The maximum number of changes of direction for the Statistics/TD_SET parameter is 16.67 million.

CAUTION!

Danger
When the ZAdynpro is replaced, the current counting value of the down counter "TD_CNT" must be transferred to the new ZAdynpro!

13.8.3 Deactivating the travel direction counter

To deactivate the direction change counter, the following parameters have to be adjusted.

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

Enter the previously assigned password in the **Statistic/TD_PW** parameter.

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

Enter “0” in the **Statistic/TD_SET** parameter.

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

Enter the previously assigned password again in the **Statistic/TD_PW** parameter.

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

Enter “0” in the **Statistic/TD_PWN** parameter.

13.8.4 Configuring an activated travel direction counter

If a travel direction counter has already been activated, its functions are blocked by a password. This can be recognised by the fact that “56366” is displayed in the **Statistic/TD_PWC** parameter.

```
Statistics
 TD_PWN 0
->TD_PWC 56366
```

In order to make subsequent changes to an activated travel direction counter, the previously assigned password must be entered in the **Statistic/TD_PW** parameter.

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

13.8.5 Output functions

Two special counter functions can be assigned to the digital outputs of the ZAdynpro when using the travel direction counter:

Parameter	Function	Explanation
Suspension means info	Suspension means replacement necessary	Contact closes if the current suspension means can be used for approx. 1 more 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

13.8.6 Resetting the travel direction counter

Information
At the end of the maximum change of direction, the ZAdynpro is locked and the error **"E950 TD_CNT: Drive limit"** appears on the display.
To enable the cabin to be moved to the position for replacement of the suspension means after locking the frequency inverter, the ZAdynpro must be switched off and back on. Further travel is then possible.

After successfully replacing the suspension means, the password has to be entered in the **Statistics** menu and the reverse counter set to a new initial value:

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

Enter the current password in the **Statistic/TD_PW** parameter to enable the down counter value to be reset.

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

Enter “0” in the **Statistic/TD_SET** parameter.

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

Enter the current password in the **Statistic/TD_PW** parameter.

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

Enter “0” in the **Statistic/TD_PWN** parameter.

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, in the **info menu** on the **TravelDirection** page, press the ↵ key.

13.8.7 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:

- every 100 changes in direction up to 1,000 changes in direction
- every 1,000 changes in direction up to 10,000 changes in direction
- every 3,000 changes in direction from 10,000 changes in direction

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

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

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

Enter the current password in the **Statistic/TD_PW** parameter.

```
Statistics
↳TD_RST  OFF
  ↳      ON
* Restore counter read-
ing
```

Set the **Statistic/TD_RST** parameter to “ON”.

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

13.9 Self-monitoring of the brakes as per EN81-20

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.

13.9.1 Activation of the self-monitoring

The self-monitoring is activated by selecting the number of brake circuits and the function of the microswitch 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).

```
Monitoring
↳BR      2*NO
  ↳      2*NO
Brake monitoring
```

```
Startup
↳BR      2*NO
  ↳      2*NO
Brake monitoring
```

13.9.2 Activating the ZAdynpro lock in case of a malfunctioning brake circuit

The lock function on the ZAdynpro is engaged by activating the **LOCK_X=On** parameter in the **Monitoring** menu.

```
Monitoring
↳LOCKBR  Off
  ↳      On
Lock on malfunction
```

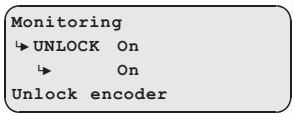
Activation of the parameter ensures that the ZAdynpro locks upon detection of a faulty brake circuit. The ZAdynpro lock can only be released by configuring the **Monitors/UNLOCK = On** parameter.

13.9.3 Function test of the self-monitoring

Functional test according to EN 81-50:2014
The self-monitoring test required by EN 81-50, 5.8.3.2.5 is performed for every software version during the internal software test at Ziehl-Abegg.
For this, 10 test runs are made and the function of the self-monitoring checked.

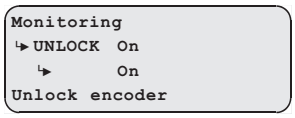
Function test in start-up
If the drive unit brakes are used as brake elements for protection against unintended movement of the car, a function test of the self-monitoring must be made during start-up.

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 ZAdynpro 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 ZAdynpro is still locked.
7. Release the lock by configuring the **Monitors/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 ZAdyn.
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 ZAdynpro 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 ZAdynpro is still locked.
7. Release the lock by configuring the **Monitors/UNLOCK = On** parameter (see display).
8. Start new run, this must take place without errors.



Repeat test step 2 for every monitor input.

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