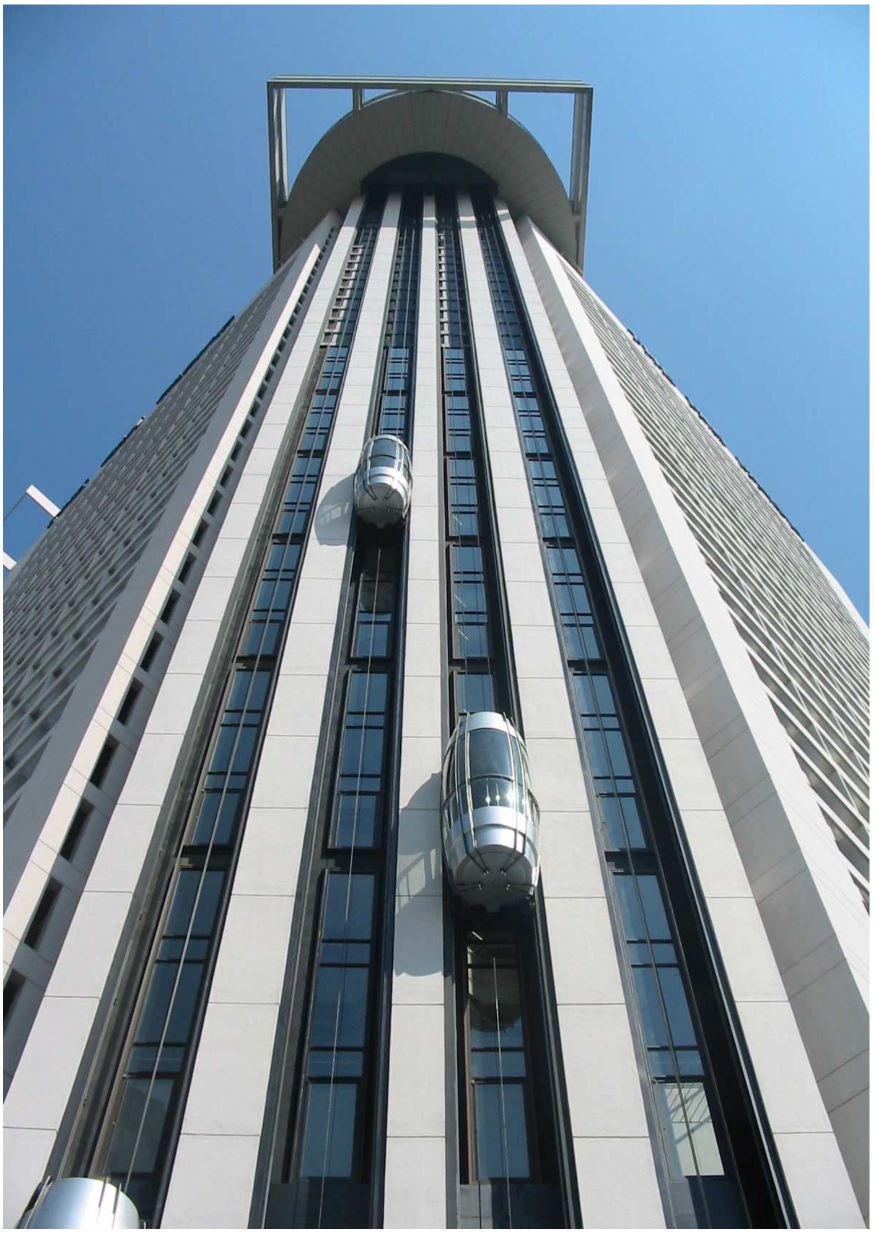


Manual

iAStar AS380
frequency converter with integrated lift control system

Version E2.0 (MAI)

Content

Content

1. iAStar AS380

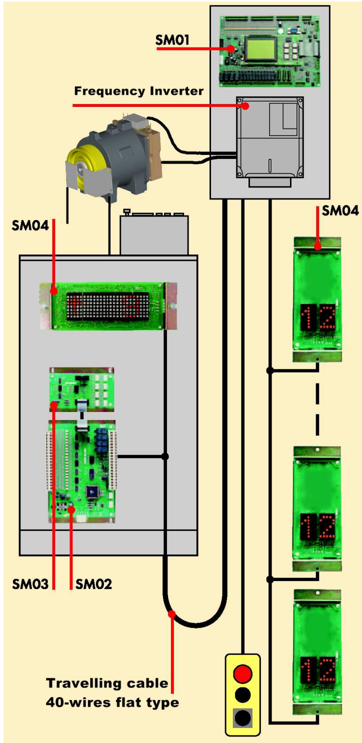
Characteristic

- Converter and control in one unit
- Reduced wiring
- simplified parametrisation and commissioning
- 32bit processor ARM7 industry standard
- Dual processor design for enhanced safety requirement
- 2x CAN interfaces for internal & external communication
- High EMc-stability (EFT-4000V)
- High ESD-stability (ESD 8000V)
- EN81, GB7588, CE certified

scope of operation

- For synchronous and asynchronous drive
- numerous parameterizable operations for almost all types of lifts.
- Lifts from 0,1m/s to 10m/s.
- Up to 64 stops
- 2 group cluster integrated
- up to 8 in one group with group controller
- prepared for call control
- shaft copying by shaft encoder and magnetic sensor
- compensation of load during start with and without load measuring unit
- ID-card system(id card-transponder) integrable
- remote monitoring local and global
- 7 segment disply on board
- graphic LCD on separated handtool
- depiction of driving cycle, input & output state,statusinformation
- error memory (20 errors) with real time registration plain text display.
- Standard for two cabindoors
- numerous special functions eg automatic evacuation .with load dependant selection of direction

2.Overview of system



SmartCom is a modern, on newest technology based control system especially for elevators.
The system consists basicly on compnents as follows:

- Control circuit terminal iAStar AS380 with integrated frequency converter
- car controller panel SM02G
- command board SM03 panel for keys
- Car top control board SM02H
- Display& control board SM04
- Extension board SM09

Different variations from each of the the panels/ boards enables an otimal match between the control system and the elevator in the required range.
Simple or complex controls based on the always consistent CAN-records could be implemented.
All components are combinable and extensible due to the CAN-system .

Integrated frequency converter iAStar AS380

This modul optionally in the shaft or outside consists of the frequency converter and the central unit SM01 of the elevator control. It includes all functions, especially the drive control, detection of car-position and a lot of special functions, which are normally allocated in the shaft or engine room.
It communicates via the CAN-Bus with the other modules.

Car controller panel SM02

All functions which are related to the cabin are realised by the car controller panel . It is connected via CAN-bus with the control circuit terminal.
There are two variations. The „classic“ which only one SM02/03, and now with the 32bit board F5021 established fragmented variation. In this case there is integrated one SM02/H in car top control panel and one SM02/G the car controller panel. Thus the 36-pole cable is reduced to a 12-pole control casble between the car top panel and the car controller panel. The connection from up to three additional car controller panels/ console panel is now very easy via CAN-bus.

Command board panel SM03

This board is connected to the car controller panel. Up to 8 panels can be connected to an SM02.
One command board provides 8 inputs & 8 outputs for the related confirmations.

Display & control board SM04

Those boards could somehow used as floor-display in the cabin or other as floor display for each floor with indication of floornumber and continuing indicator.

The adressing is made by DIL-switch or the floor button.
The SM04 is available in different designs: Horizontally, vertically and vertically-slim. The diplays varies in design and circumference and can also be customized.
All SM04 can communiucate via CAN-bus and are combinable in any order.

In the floors on the SM04 Modulen (Disply+CAN-Modul) the push-buttons for the hallway calls and the key-switch for special function. Newer panels permit also to connect a loudspeaker for the EN81-70 required beep.

Special board SM09

Via those customized special functions could be realised without changing the control circuit. For example the electronic electronic custodian system of the customer or additional fault-messages.

Functional overview

Standardfunctions		
1	Group controllers	Collecting hall calls with respect to the given direction
2	Inspection run	Up or down. In the door zones the door open button can be used to open the door.
3	Self liberation with slow drive	If you miss the door zone in normal mode the elevator drives slowly with closed door into the levelling position and opens the door.
4	Testrun	For Testpurposes the elevator can make a determined number of random testruns
5	Realtimeclock	Errors are registrated with date and time. Functions can be temporary activated
6	Time to keep doors open	Dependant of the kind of call (Interior, exterior, service, special call), the time to keep the doors open can be indicated.
7	Door opening by local calls	Is the elevator allready in the floor from which the call comes, the door opens.
8	Premature closing of the door.	With the door close button the door can be closed before the „Door open-Time“.
9	Forced opening of doors	Inside the the door area with the door open button the door opening can be forced for closed doors which are actually closed.
10	Return motion automatic	In case the cabin is not closed within 15 sec. after arrival at the door-close endswitch, the door open again for a new try.
11	Monitoring of door opening	If 15 sec. After opening of the door the final door switch is not the door closes for a new try.
12	Cancelling of call	Via double -CLICK of a call button the call can be cancelled.
13	Terminal landings	In the upper terminal the UP command is deleted; in the lower terminal the down command is deleted.
14	Direct drive	Direct drive without rat run. Is activated when incremental copying and analogue control. The travel curve at this will be created by the controller,
15	Cabin Full	If full load, the cabinet do not stop anymore for hall calls
16	Cabin door light OFF	After 5 Minutes without activity the cabin light is switched OFF
17	Parking drive	After a ajustable time without activity the elevator drives into main floor
18	LCD control	Graphic display with extensive status information and menu navigation
19	Analogue speed setting.	The rotation frequency of frequency converter is guided by the analogue output.
20	Digital speed inputs	Optional the speed can be set via contacts.

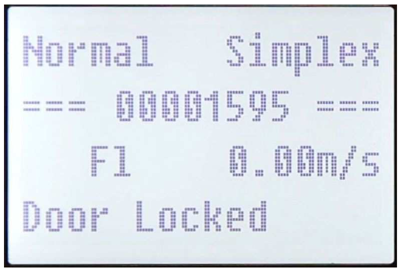
21	Error storage	'the last 20 errors are stored with time, floor no and error code
22	Learning movement for shaft infos	The control learns via encoder and the floor flags the shaft measurements and braking distances. After this the elevator can drive in normal mode.
23	Clearance of floors	Setting of floors which can be reached.
24	Setting of floor indicator.	The signs which appears in each floors can be selected
	Liftboy control	The elevator is driven manually via car controller panel. Hall calls are served.
26	Priority inside	Hall calls are deactivated. Only inside commands are effective.The door had to be closed by door close button. The button has to be pushed until door close final switch is reached.
27	LED-dot matrix display, LCD graphic display	In each floor is a dot matrix display which indicates floor stand, direction and status. The user can see wether something is going on.
28	Display with roll funbction	According to the drive direction the display is rolling.
29	Automatic correction of shaft datas.	The shaft informations are continously corrected..
30	Remote deenergisation	The elevator can be disengaged at which all ongoing car/ cabin commands are executed prior to shut off..
31	Door is only opening in door zones.	Out of the door zones the the cabin door cannot be opened.
32	Light barrier/ light curtain	Light barrier/ light curtain is evaluated by control and prevent door closing if activated
33	Overload	When overloaded the door remains open and buzzer is going on.
34	Misuse detection	If cabin is empty the cabin calls are limited.
35	Direction of rotation	Is a wrong direction of rotation is detected elevator stops.
	Route monitoring	Is the cabin not moving despite active drive the drive stops after 40 sec. New runs only after reset possible.
37	Monitoring traction	Is cabin moving despite stop od drive alarm is engaged.
	Limit switch inspection run	Limit switches prevent that elevator is running into emergency limit switches during learning movement or bring-back run.
39	Contractor monitoring	This control checks during every run the function of main and brake contactors.
40	Speed monitoring	When overspeed >emergency stop!
41	CPU Monitoring	The processor is monitored via watchdog and restarted if necessary.
Optional functions		
1	Preopening doors	Via safety circuit
2	Fine levelling with open door	Via safety circuit. For hydraulic standard function
3	Fire control system	When fire signal run elevator in fireman floor and stays with open door.
	Fireman control	All commands are dropped and the elevator runs into fireman floor. Now the firemen can use elevator.The doors doesn't open automatically but has to be opened with door open button. Release of button actuates immediate closing-european (EN81) und russian (PUBEL) option
5	2nd car controller panel	A second car controller panel can be easily fixed.
6	Car controllerpanel for 2. door	selective door control
7	Handicap panel	Own panel (eg desk panel) for handicaped people longer door open time
8	Duplex-Function	Via 2nd CAN-Bus two elevator can be connected to a 2group-system. The elevators share the calls correspondant the actual situation in order to reduce the waiting time to a minimum. Addionally a function could be activated which brings the nearest elevator to the parking level to dispose him (waiting).
9	Groupfunction	In an optimal control up to 8 elevators can be combined to a group. The group control collect the hall calls and dispatches correponding the actual location of the elevators to reduce finally the waiting time to a minimum.
10	Rush hour filling building	Via internal time settings the haul capacity can be adapted (typically

		office building)
11	Rush hour emptying building	Via internal time settings the haul capacity can be adapted (typically office building)
12	Dispatch waiting elevator	When all calls are executed after 1 min the elevators of a group are distributed in the building; one is going to the main parking floor the others remaining in different parking positions to reduce waiting time.
13	Interface to building control system	RS485 interface to link to PC for building control
14	Remote monitoring	The elevator can be integrated in an overall remote monitoring system.
15	Drive in Gong	During the landing approach a gong under the floor or over the ceiling of the cabin informs about the arriving cabin.
16	Driving on displays HOP	In the hall indicator panels with an accoustic and optical display could be integrated.
	Floor gong	In every floor a Gong could be provided.
18	Card reader in the cabin	With a transponder card could either a specific call be released or presetted calls be released
19	Card reader in the floors	Release of hall calls
20	Selective door control	Back-and frontdoor could be separated.
21	Push mode	After 1 min the door is closing slowly despite the light array.
22	VIP Service	A key switch in the HOP deletes all hall calls and brings the empty cabine. Now several inside calls could be setted. After this the elevator switches back in normal mode.
23	PIN entry via call button	For specific selection of floors the call buttons can be used to entry a PIN
24	Floor activation locally controlled	For simple or duplex elevators an altered setting of floors can be entered via key switch.
25	Floor activation via group control	Floor settings can be temporarily changed via groupannexe
	Temporarily blockade from individual floors	Floors could be blocked for short time from the user.
27	Automatic Evacuation	In case of a power failure with following emergency power supply the cabin runs to the next floor
8	Emergency power evacuation	For elevator groups the evacuation is made one after another.
9	Earth quake Function	Elevator stops during run and brought to the evacuation stop.
30	announcement	Serial and parallel connection for announcements

3. Hand device

ESC	Parameter/leave menu		ENTER	Select parameter, set parameter/take over param.
F1 & F2	Quick select from error storage, In-Out display- , CAN- and shaft encoder		F3	Quick select graphic drive curb
↑	Next Parameter/menupoint Increase of choosen decimalplace		←	Jump back 10 parameters/ one decimal point left
↓	previous Parameter/Menupoint Decrease of choosen decimal point		→	Jump forward 10 parameter one decimal point right.

operation:



Startwindow

In normal case the state, the group affiliation, actual floor, actual speed and the actual state of doors or drive

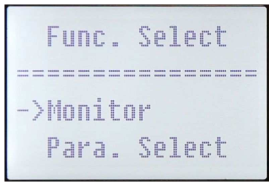
The number in the 2nd line depicts the counter of runs can also be setted for another value.

Log in:

Login

To see the state or to set parameter you have first to login. After pushing the ENTER button appears the password. Standard for the Password „1234“. After login under Chg.Password“ the password could be changed.. Attention! Don't forget Password! The control can be unlocked only in the fatcory without Password!

Menu



Main menu

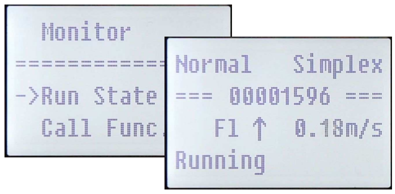
The complete menu tree you'll find under „ Menu tree & parameter.

The Startwindow shows state, group affiliation, actual floor, actual speed and the actual state of doors or drive.

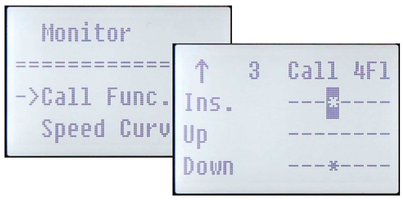
With „ Enter“ you're going to main menu. Again Enter select Monitor-Menu, which has all diagnosis windows.

State menu under „Monitor“

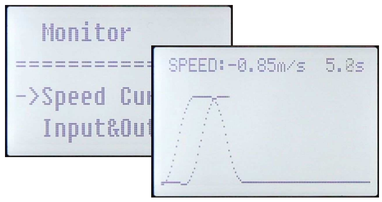
Run State conforming to the start
In the first line you see mode (Normal, Inspection, Fire Return, Firemen, Park) and state of group (Simplex, Group).
Below counter of runs, Floor, speed and the actual action.



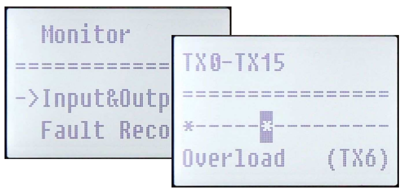
In Call. Func. The actual calls are depicted and you can also set calls (with the arrow up/ dwn and Enter).
Cabin calls, hall calls up and down.



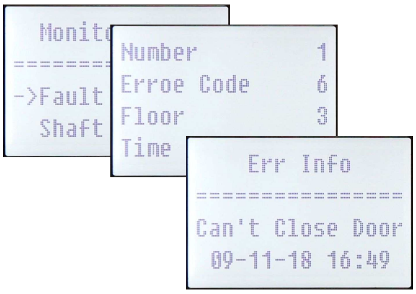
Speed Curve is the graphic depiction from speed encoder.
Above the actual speed and running time is indicated.



In the window Input&Output all inputs and outputs are depicted.
With the up/dwn buttons youre switching between the 16er groups.
With right/left a single input/ outout could be marked. In the line below appears the function of this input/ output.
The designation X (Input SM01) and Y (Output SM01), plus TX (Input SM02) and TY (Output SM02) you'll find in the electrical circuit.

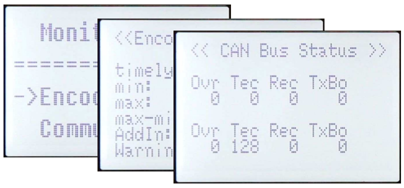


In the fault Record the last 20 faults are depicted with date, time and which floor.
The newest fault ist always shown at first.
With UP/ down you're moving between the entries in the list. With ENTER a new window appears with date, time and clear text entries.

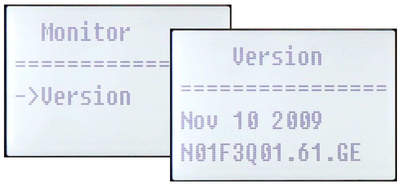


The list Shaft Data includes the floor positions which had been determined during the learning movement in mm. By this you can easily check wether the positions had been correctly detected during the learning movement.

The windows Encoder Eva und Communication are helpful when problems with the encoder or CAN-bus occurs.

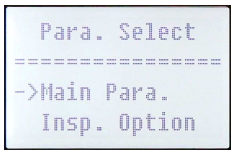


In the version window date and version number of the firmware are shown. Before updating you should check wether the update is more actual then the existing one.

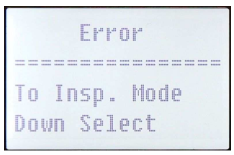


To set parameter in the submenu Para.Select

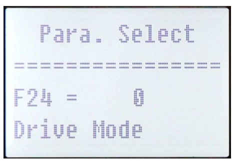
Via the parameter menu you can acceed on numerous parameters.
There are groups of parameters where the parameters are thematically arranged. For example motor or door parameters. There is also a list where parameters are asorted though numbers.



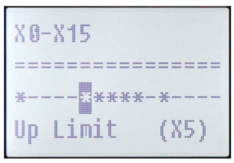
Most of parameters could only be set in inspection -or return motion mode. If the warning appears switch to inspection mode.



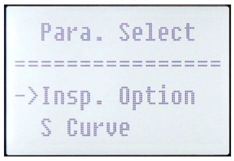
All parameter are set in 16bit integer numbers. Most of them in decimal numbers together with the unit.
Eg 50 with a setting of 0,1 s means 5 seconds.



Some of the parameters only exist as a bitmask. Depicted is a decimal value, but as soon you want to set a value the bitmask appears and with left/ right you can move and set or delete the values.
 (* means set, - deleted).
In the lower line appears the description of the Bits.
By this for every input the logic break/ make contact could be individually set.



Insp.Option include all parameters which are necessary for the start-up in the inspection mode
S Curve is needed for the use of the analogue Output of the converter control.



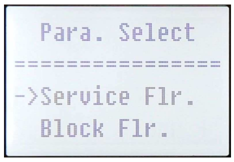
Lvl.Mic.Adj. Enables the correction of each levelling at every floor. Normally not necessary because the floors are calibrated during the learning movement.

Multi Speed includes all parameter, which are necessary for the run of the converter in multistep-mode (parallel control).
Door Control enables the parametrisation for door control.

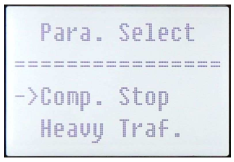
Flr.Disp. Leads to the list of the floor idicators.
For every floor you can set individually the displayed letter combination (for Step SM04 displays). The announcement for the landings on each floor is fixed by this dsiplay code.
The Display codes are stated in a chart in the appendix.

Service Floor determines the enabled floors. Also the floors which are only enabled by key-switch are determinded.

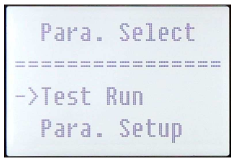
Block Floor permits blocking of a floor via time or key switch..



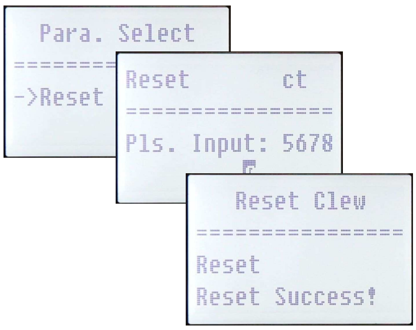
Comp. Stop (enforced stop) defines stops where the elevator is brought to an enforced stop when passing by. Make sense in some cases for Hotels.
Heavy Traf. Permits the function „emptying/ filling building“.
So the haul capacity of a office building could be increased



In Test Run the parameter F34 can be set for a number of runs, which the elevator should make without any command for testing purpose.
Para. Setup is the access to the complete parameterlist.

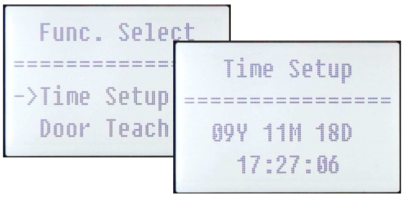


Reset brings all parameters to factory setting. Has only be made if absolutely neccessary! Before the Reset a number has to be entered to avoid an accidantly reset.
Attention! After the entry of the number the reset is made without any further inquiry!
Set F146 imperativly on 0 !

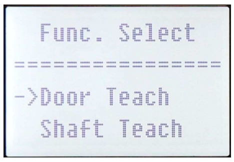


different functions (Func.Select)

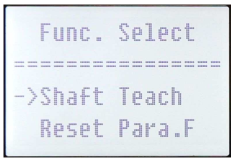
Time Setup: setting of then realtime-clock. Is needed for the fault-record and the time dependant enabled floors. And also for the function „filling/ emptying building“.



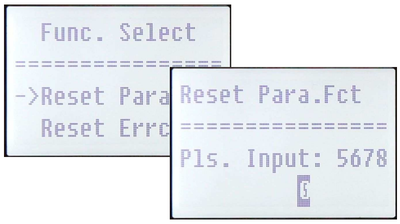
Door Teach: detect via opening and cloasing the function of the door-endswitches.



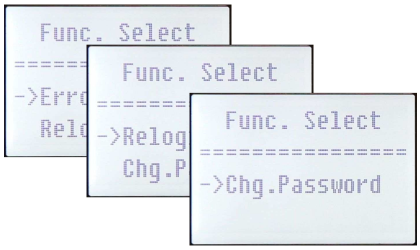
Shaft Teach: has to made imperativly before going to normal mode (after mounting or changing door position)
Door, bus, shaft copying and cabinlight has to work correctly.
After activating of shaft teaching the elevator runs in the lowest stop and starts with the learning movement.
After finish the elevator can go into normal mode. If an error occurs the learning movement is stopped and an error messages appears..



Reset Para.F: Rest on factory setting!!!
Reset Errco.: deleting of fault record!



Error Reset: Reset after Lift Error (fatal fault) eg. Run monitor, contactor monitoring, Bakemonitoring etc..
Relogin: Logout and relogin.
Normaly after 10 min. without input automatically logout!
Chg.Password: changing Password
Attention! Don't forget password-could only be resetted in factory!



4. Menu tree & parameter

Function	main	sub	description
Monitor	Drive Status		Elevator status (Floor, speed etc.)
	Call function.		Calls for side A and depict
	Speed curve		Graphic depiction of drive curve
	Input&Output	X0-X15	Status from In-outputs
		X16-X31	Status from In-outputs
		GX0-GX15	Status of inputs on SM02 in car controller panel
		HX0-HX15	Status of inputs on SM02 car top panel
		Y0-Y15	
		Y16-Y31	
	error record		Error record
	Shaft Data	floor Pos.	List of the floor datas
		switch Pos.	Positions pre-limit switch
	Self-diagnosis	CAN Com. Eval..	Diagnosis of CAN interfaces
		Encod. Eval..	Analysis of encoder
		Call diagnosis	
	Version		Depiction Software-Version
Para.Type	Basic-Param..		Basic-Parameter
	Comfort Adjust.	S-curve	s-curve-parameter
		PI Adjust.	Inpection-parameter
	Lift Model		
	Motor Model		
	Level Adj.		
	Level micro adj		Level Micro Adjustement
	Input Type		Input-polarities(NO/NC)
	Flr. Disp..		Set code for Floor display
	Door control		Door parameter
	Dr Open Allow		Enable doors
	Service Flr.		Enables floors
	IC Setup		
	Time blck Flr.		
	Parameter F		All parameters in one list
	Reset Lift P.		
	Rest FU Pa.		
	copy Para	Dnload OP	Parameterdownload into . Handdevice (*1)
		Upload to MB	Parameterupload back into control circuit terminal SM01 (*1)

Comissioning	Shaft tech		Learning movement
	Motor teach		
	Test Menu	Up limit test	Measuring end switch up
		Dn. limit test	Measuring end switch down
		Drive test	Test run monitoring
		M.cont. test	
		B.cont.Test	
		Brake swi.Test	
		A3Test UP	
		A3Test Down	
	Terminal Call.		
	Testrun		Number of random testruns
	Load adjust.	Load teach	
		Load Status	
	Door operate		
Reset	Reset Errcode		Reset error record
	Reset LiftP.		Reset Steeringparameter on factory setting.
	Reset Inv.FU Pa.		Reset Inverter parameter on factory setting.
	Reset times		
	I/O Reset		Reset of Input/ Output functions
Additional funct.	Time Setup.		Set time
	Input sel		
	Output sel		
	floor Offs.		
	Home flr setup		
	Fire mode.		
	Gc mode		
	Homing delay		
	Gong Output		
	Fan& Light time.		
	Attd Mode		
	Call type		
	Call Cancel		
	SM01 limit		
	MB Num. lmt.		

Sel English	Sel Deutsch	
	Relogin	
	Chg. Pwd.	
Relogin		'Relogin
PWD aende.		Change Password

Basic Parameter

Nr.	*Standard*	*Beschreibung*	*Hinweise*
F6	1m/s	Rated elev. speed	
F204	12.0A	Rated current motor	
F211	2048ppr	Encoder resolution	
F11	18	Number of floors	
F36	0	Brake switch. M.	
F153	0	Deadbolt monitoring	
F156	0	Check of security loop	
F25	35296	Setting for each I/O, if (NO=normally open) (NC=normally closed) Depends on the circuit and the connected switch	Bitmask
F26	83		
F27	835		
F28	0		
F202	1	Type of motor	1= Synchron-Motor
F203	4,7kW	Ratet motor power	
F205	29,4 Hz	Rated motor frquency	
F206	160RPM	Rated motor revolution	
F207	360V	Rated motor tension	
F208	22	Number of poles	
F235	32,00%	No-Load current factor	
F210	2	Type of encoder	2 = EnDat

Comfort Adjust:S-Curve

Nr.	*Wert*	*Beschreibung*	*Hinweis*
F0	0,55m/s²	acceleration	
F1	0,55m/s²	retardation	
F2	1,3s	Curve adj Start	
F3	1,1s	Curve during transition const. run	
F4	1,1s	Curve during left constant run	

Nr.	Wert	Beschreibung	Hinweis
F5	1,3s	Curve during stop	
F13	0,03m/s	Bring-back- in position-speed VN	
F16	0,6s	Brake retardation	
F17		Retardation Inverter unlock/ enable	
F181	0,5s	KMY Delay (fix)	
F175	0,006m/s	Creep speed	
F186	0,7s	Time for creep speed during Start	
F193	50,00%		
F194	50,00%		
F195	50,00%		

Comfort Adjust: PI Adjust

Nr.	Wert	Beschreibung	Hinweis
F212	40	ASR P0	PID Parameter during start-up/ Stop(Zero Servo)
F213	60	ASR I0	
F214	0.5	ASR D0	
F215	40	ASR P1	PID Parameter for the range >0 but <F0
F216	60	ASR I1	
F217	0.5	ASR D1	
F218	40	ASR P2	PID for the range >F0 but < F1
F219	60	ASR I2	
F220	0.5	ASR D2	
F221	40	ASR P3	PID for the range >F1
F222	60	ASR I3	
F223	0.5	ASR D3	
F224	1,00%	Change Frequency F0	limit F0
F225	50,00%	Change Frequency F1	Limit F1
F226	0,8s	V0-Holding time	

5. Commissioning -Installation run

Attention! Before start for the first time, check wether CAN-Bus is inactive ! Means that JP4 on the circuit AS380 terminal is disconnected!
By this blocking from HDR Lock Error (Steuerung had detected bypassed security loop)is avoided. Is blocking already active see HDR Lock Error.

General:

Installation and commissioning should only be made from personel which is familiar with the electrical and mechanical mannerism of the elevator. Deficient commissioning or installation can provoque risk for life and limb.Due to the characteristcs bypasses have to be made during installation. Most of the bypasses are already set for testing reasons on the test facility.
During the installation process those bypasses are removed and replaced by security switches.
As soon as a new component is mounted eg folding support, loop into the security circuit!

On sheet 3 of the wiring diagram the complete security plan is depicted.

Check all security switches on their correct function and effectiveness.

Especially the switches on the fold -away-bracket in the security space and the folding support.

At X88 on Servicepanel measurement in the security loop could be executed.

Condition for commissioning run:

- Drive, Control cabinet, service panel and brake resistance are mounted and connected. (don't forget Temperature monitoring at X4.3 and X4.4 eventually bypass otherwise K0 doesn't actuate.
- Car top control is fixed and connected via the trailing cable. If not so, provide bypasses (sheet 3) and switch S50 on Inspektion.
- Sheelds from motor, brake resistance and encoder are correctly placed.
- Security loop is closed up to X20 (display on inverter LED board or on Service Tool in Monitor/Input-Output X20 und X21).
- Check parameter on Servicetool (see Details below)
- Now push Inspecion Auf or Ab , the Motorcontactors should actuate and the inverter should execute for 1st time a tuning (Phasenwinkel) . Identifiable by a noise. (If Contactors don't actuate, check wether security loop is closed while switch „Inspektion / Auf/ Ab“ is pushed up to X21 -otherwise a bypass is missed or a switch is open-indication on service tool.
- Motor should slowly start after the „tuningnoise“. If he is jumping, repeat tuning (for this set Parameter F242 at 0 and restart commissioning)
- If motor is still jumping, change two phases and repeat previous pace.

Groupfunction

The parameters for the groupfunction has to be set as follows::

- F23 = 3 (on each control, which is in a group)
- F181 = 0-7 (Number of elevator in one group-the lowest number has highest priority)

Security loop – Return-motion -control

First ashure that security loop is closed
If it is necessary to bypass parts of securityloop, precautionary measures has to be taken for running the cabin.
One has to make shure that nobody is in the range of the doors or in the shaft!

At first connect all existant security switches and elements
If this is not possible the relevant strapping plugs should be placed.

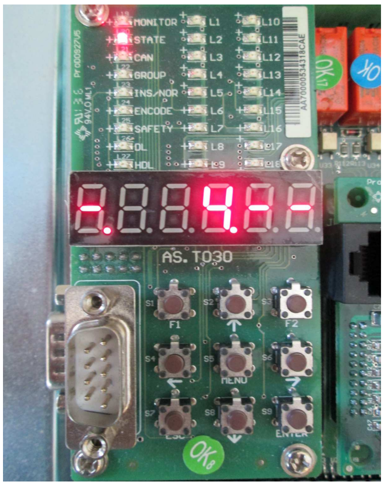
First movement with the Return-motion -control

When it is checked that there is no danger of collision first run with return-motion-control could be made.

If the elevator does not move in the intended direction, the correct rotation direction should only be set via the inverter.

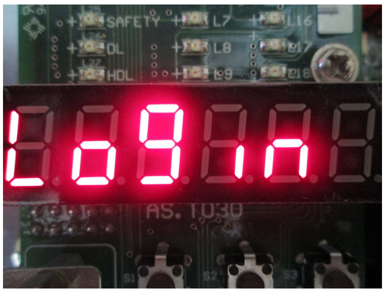
Please go to following menu part
F - XXX
Parameter F234 = 0 (change to 1)
Parameter F234 = 1 (change to 0)

Setting the parameters on AS.T030

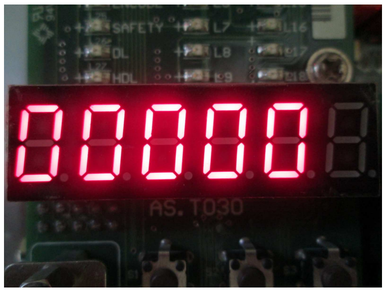


Depiction 7-Segment Display on a AS.T030 board in normal operatin state

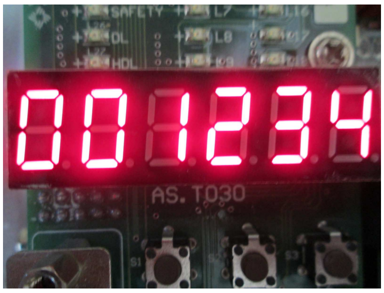
When pushing the arrow push-button left and right the menu points are depicted choose menu „LOGIN“.



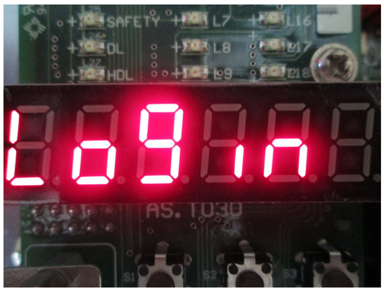
Push Enter



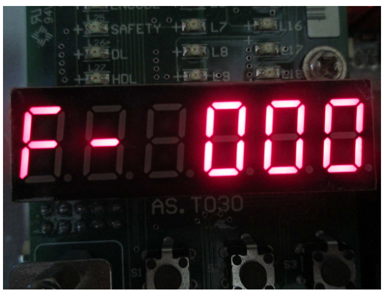
Now the 4-digit password could be entered. By pushing the up/down arrow you set the number, by pushing left/right the ciphers are set. The cipher is blinking in a 1 sec pulse. Password: 1234



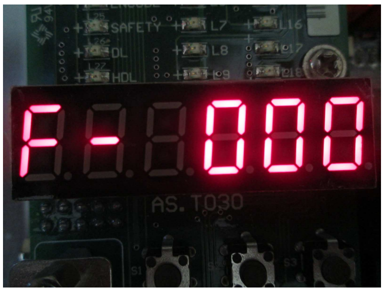
Push Enter



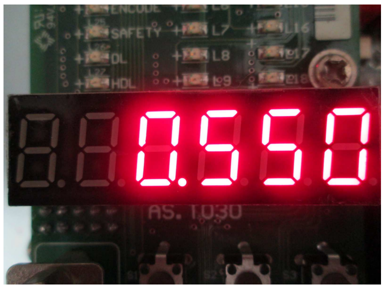
The authorization for changing password is now enabled.
When pushing left or right the parameter menu could be choosed.



In a 2-second pulse the value of choosen parameter is depicted.



2 sec. Takt



When pushing up/ down button the individual parameters are selected.
A change is enabled by pushing enter. Again enter confirms value.

Checking parameters for commissioning and eventually adapt

Normaly the parameters are set in the factory at the test field.

Since there are three 3 makes and several power class used, it is possible that the pre-set values are inappropriate. Is there another drive than Sassi or Torin in use or the speed is other than 1m/s please imperativly check the parameters!

Par.	name	Function	Setting	Remark
F06	Speed	Rated speed	1,0m/s	Attention! If a motor asigned for 1m/s is driven with 0,63m/s , rated frequency (hz) and rated revolution (RPM) has to be reduced correspondantely!
F12	Insp. speed.	inspectionspeed	0,25m/s	
F16	Braken open redardation.	Retardation -Brakeopen	0,2s	
F17	FU enable. retardation	Time for brake come-in compensate	0,5s	Could be considerably longer for Swiss Traction
F25	Input TypeX0-15	Input logic (NO/NC) input AS 380 main board		Normally presetted; for commissioning the inputs of pre-endswitsch should be (X4,5,18 und 19) als NO (closing contact,normally open)
F26	Input TypeX16-25			
F36	Brake switch M.	Brake monitoring	0	Brake monitoring should be inactive as long as brakeswitch is not connected.

Par.	name	Function	Setting	Remark
F59	Retardation brake off	Stoptime during start	0,5s	Came out as good compromise between slight Rollback and fast Start .
F62	Running time limit.	Runningtime monitoring	32s	
F76	*Lim. UpDis. Ins.*	*End of insp. up*	*0mm*	*To avoid problems due to missing shaft copying set on „0“. later there were adopted not to run up into pre-end switch Inspection and down not into support.*
F77	Lim. DnDis Ins.	End of insp. Down	0mm	
F122	Retard. Run Insp	Retardation between Brake OFF and running signals	0 – 1 s	Is only working when stopping by pushing Auf and Ab during inspektion
F165	Door Kontr.Spez.	door open functionality	0	
F175	Start creep-speed	Creep-speed during Start	0,006m/s	
F180	Analog value->Vnen	Attribution speed to rated speed	100,00%	Shouldn't be changed
F186	Duration of creep-speed when Start	Duration of creep-speed when Start	0,5s	
F201	FU Modus	Inverter Modus	3	Vector Modus with encoder
F202	Motort Type	Motor Type	1	Synchronous-Motor
F203	M Rated Power	Rated motor power	4kW	This are values for Torin at 630kg/1m/s. At 0,63m/s result a frquency of 16,67Hz at a revolution of 100RPM! In any doubt check type-plate.
F204	M Rated Current	Rated motor current	10,5A	
F205	M Rated Freq	Rated motor frequency	26,25Hz	
F206	M RPM	Rated motor revolution	159RPM	
F207	M Rated Voltage	Rated motor tension	380V	
F208	M Pole Num.	Numper of poles	20	
F209	M Slip Freq		1.4 Hz	
F210	Encoder Type	Type of encoder	2	EnDat
F211	Encoder Pulses	Number of pulses encoder	2048	
F212 to F226 are for the revolution controller and so for die running quality. See also description „Parameter Drehzahlregler“				
F227	Brake Time	Retard brake fall in	0,2s	
F228	Curr. Descent T	Time for demagetisation	0,3s	Should be ok to avoid „knack“ after stop.
F232	Encoder.Filter.Time	Time for filter encodersignal	1ms	1ms proved as ideal.
F233	Enc. Direction	Sense of rotation encoder	1	Has to be at 1 If OC Error or jumping after tuning. Change motorphase!
F234	Motor Phase	Adoption direc of rotation motor	1	If Auf and Ab doesn't correspond with direction of cabine-set on 0.
F239	Output-Torq Lmt	torque limit	175,00%	Could be raised ev. Up to 200%

Par.	name	Function	Setting	Remark
F242	Enc Phase Angle	Phase angle of encoder	??	By setting on 0 the tunning could be forced for next run. If for every tuning the same value came out-somethingn is wrong with encoder cable orn bobine of motor.
F245	Selection of F246-255 Parameter Function	Choice of parameterfunction	6	The following parameter only have the function if F245=6t!
F246	Synchronous motor study when power on	Automatic measurement offsetangle after power failure	0	Since a absolute encoder is used, the offset angle has only be determined once during mounting.
F247	current gain when self study	Measuring current for offsetangle	100,00%	Standard is 150%, but is has proved that 100% is a better value for tuning and noise is reduced.

Parameter speed controller

The following parameter have influence during commissioning and for normnal run. In praxis the following parameters has proved workable especially for Torin motors. For SWISS-traction motor the values could be set considerably lower!.

Nr.	***Parameter***	***Funktion***	***Typ.***	***Hinweise***
F212	ASR P0	P-Factor speed controller zero-rev.	70	
F213	ASR I0	I-Faktor speed controller zero-rev.	50	
F214	ASR D0	D-Faktor speed controller zero-rev.	0.1	
F215	ASR P1	P-Faktor speed -controller for lower rev	40	
F216	ASR I1	I-Faktor speed-controller for lower rev.	5	
F217	ASR D1	D-Faktor speed-controller for lower rev.	0.1	
F218	ASR P2	P-Faktor speed controller for middle rev	60	
F219	ASR I2	I-Faktor speed controller for middle rev	30	
F220	ASR D2	D-Faktor speed controller for middle rev	0.1	
F221	ASR P3	P-Faktor speed controller for high rev.	60	
F222	ASR I3	I-Faktor speed controller for high rev.	4	
F223	ASR D3	D-Faktor speed controller for high rev.	0.1	
F224	Change Freq0	Below this value PID1 is avive. Between F0 and F1 PID2 is aktive	1.0%	
F225	Change Freq1	Above F1 PID3 is active	50.0%	
F226	0 Spd.Servo Time	Time during motor is hold on 0 revolution when started.	0.5s	
F227	Brake Time	Time for revolution 0 when STOP	0.2s	

HDR Lock Error

This error indicates that a securityloop is bypassed. The control detects that the door close switch reports“doors open“ and the security-loop is closed.

This error blocks the elevator.To avoid this during installation you keep first the CAN Bus away. Door open end switsch is first reported from SM02/H in the inspectionbox.

To leave this condition the door-OPEN end switch has to be bypassed or the input logic has to be switched from NC to NO .

6.shaftcopying

The shaftcopying consist on an incremental encoder and magnetc switches or sensors.

The incremental encoder is situated either on the drive or in the shaft.

For cable elevators one prefers the encoder of the motor which could transfer on most of the inverters the Outputsignal at the controlunit.

In these case one inscribe at parameters F6 (rated speed), F7 (rated revolutionl) und F8 (solution of encoder) the real datas.

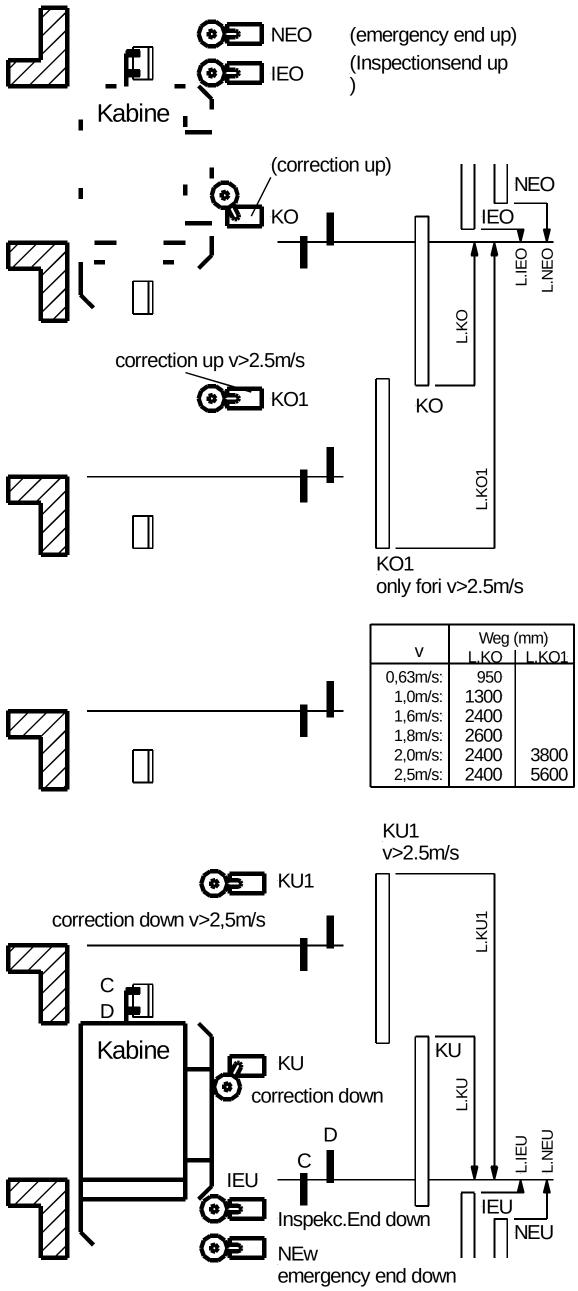
For slow running synchronous motors one has to play with parameter for rated speed,encoder pulses

eg 150U/min at 2048ppr becomes 600U/min (*4) und 512 ppr.

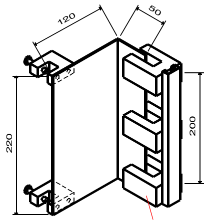
When the encoder is mounted in the shaft(circumferential cord) for the rated revolution speed a equivalent revolution speed has to be set.

In our used system with a carbon cord the values as follows come out

(F7)	0,8	1	1,2	1,4	1,6	m/s
(F8)	294	367	441	514	588	RPM



Re-levelling -sensor



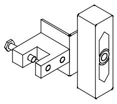
Since then shaftcopying is made via the motorencoder the slip of the tractionsheave has to be compensated.

For this purpose there is a re-levelling plate in every floor from about 220mm length This lenghtn isn't important but has to be identic in each floor.

This plate is evaluated from 2 inductive forksensorsCand D.

Cs above D is below.

Magnetic switch



Additionally there are in the head of the shaft and in the fosse two bistable magnetic switches(it could also be made with rollerswitches at the cabin)this for correction up and down and Inspection up and down.

Important that the switches are openers during a overrun they had to be open above and closed below. For the switches the same only reverse.

Correction switches

The correction switches serve the deceleration at the terminal end stops in case of error (blackout of

incremental encoder) and for learn trip. They are also used for correction of the incremental-encoder-datas. In the set of drawings, page 50 you can find these respectivly to the speed recommended distances. The exact pitch for the braking distance which is choosen by the controller is not important, as this is assigned by the chossen parameters. However, braking distance and pitch should not have a bigger difference than 45cm

Inspection endswitches

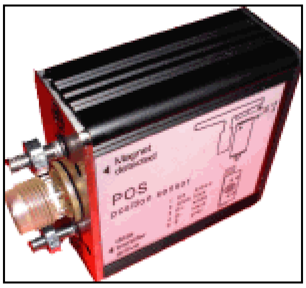
The lower inspectionswitch has to be mounted that he opens before the emergencyendswitch is actuated, but after the relevelling sensor D below the levelplate gets free. C is in the plate

for the upper inspectionendswitch it is correspondent means the IEO is avtive(contact opens)when the sensor C is above the levelplate and d is still inside the plate.

The emergency endswitchshould be a bit delocated so the elevator stops before the emergency endswitch is actuated.

The inspectionend-switches are important for the learning movement.

Intelligent Magnetic sensors iMS45



Nowadays all above mentioned switches are integrated in one Sensorsystem. Those simplifies the the installation and adjustment considerably!

The iMS45 has up to four Magnetic sensors. Together with a programmable evaluation-electronic they could generate up to eight switch signals.

For a complete shaftcopying one iMS45-POS is sufficient .

Especially for elevators without engine room one has to ad one iMS45-SPD-Sensor.

For the monitoring of speed and sense of revolution.

Depicted on the drive monitor board, which is the depiction and evaluation unit.

The transfer is via an fail-safe RS485-connection.

Design and function

Design

The sensor is in a stable aluminium housing, which is also available as IP54-version which is used in firefighter lifts.The solenoids are flat solenoids with 15mmx7mm of cross-section and a variable length. The solenoids are installed at the button of the arrester rails.

Function

In the iMS45 are 4 solenoid sensors, which are mea uring the strengh and polarity of the magnetic field. An analysis unit detect the respective switching signals and send these serial to the cabine, respectively to the drive (driving wheel) for controlling/ stearing. Additionally the iMS45-POS have an independent transistor output for e.g. contacting a chanel of a security circuit.

different detections:
* Single magnet north
* Single magnet south
* Doubble magnet upper north/ lower south
* Doubble magnet upper south/ lower north
* Tripple magnet north in the middle
* Tripple magnet south in the middle
* Crossing direction
* Crossing speed
* North/south transition is detected exactly of
each milimeter, mostlikely independent on the distace

Correct signal Inputs at AS.T030 (LEDs)

On the mainboard the signalinputs are depicted via LEDs. Those signal are transfered serial from the POS sensor to the drive monitor who directs the signals parallelto AS.T030 the sheme shows:

-elevator in the lowest leveling position within KU
-elevator in leveling position outside KU/KO
-elevator in highest leveling position within KO

elevator in the lowest leveling position within KU

Input designation	X4	X5	X6	X7			X18	X19
LED at AS.T030	●		●	●				
In control parametrised as	*	*	-	-			-	-

elevator in leveling position outside KU/KO

Input designation	X4	X5	X6	X7			X18	X19
LED at AS.T030	●	●	●	●				
In control parametrised as	*	*	*	*			-	-

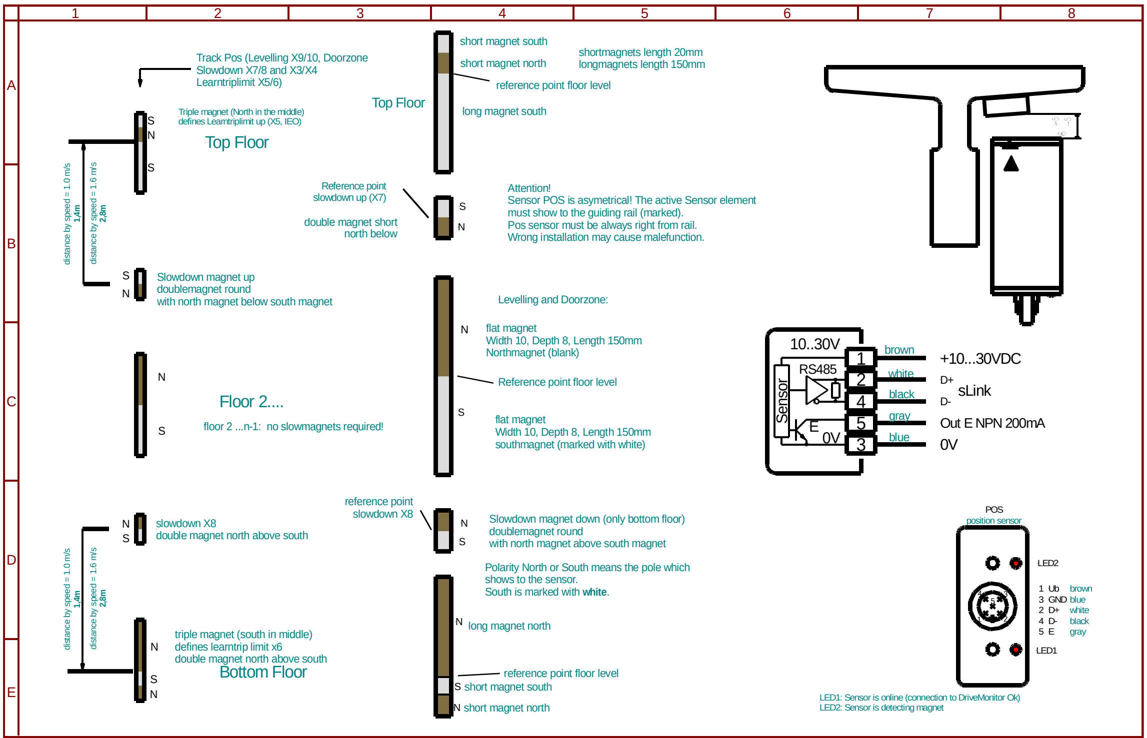
levator in highest leveling position within KO

Input designation	X4	X5	X6	X7			X18	X19
LED at AS.T030		●	●	●				
In control parametrised as	*	*	*	*			-	-

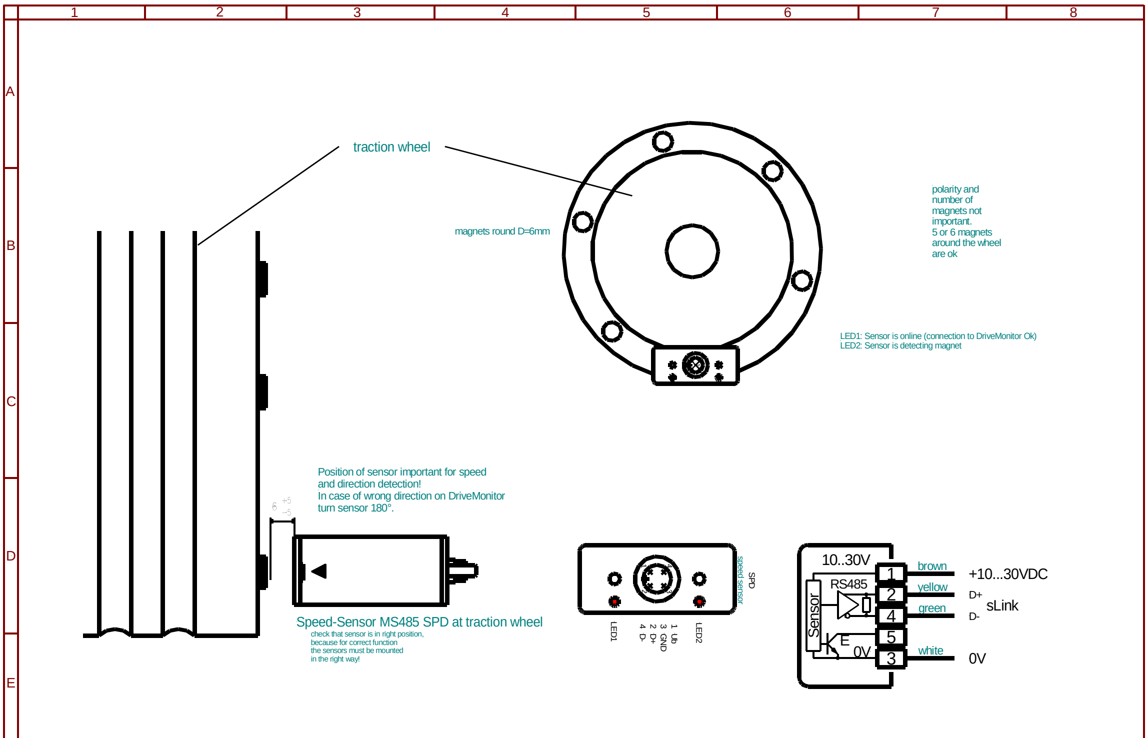
X18: correction up (Only relevant for short floor)
X19: correction down (Only relevant for short floor)
X4: correction up
X5:correction down
X6: Relevelling UP
X7: Relevelling DOWN

X18 (short north magnet) und X19 (short southmagnet) arm additional retardation switches and are only needed for short floor shorter than 1,6 m within the correction switches KU or KO. Normally they are not needed and they are not connected therefore.

The named signal has to be at AS.T029 , otherwise a learning movement is not possible.

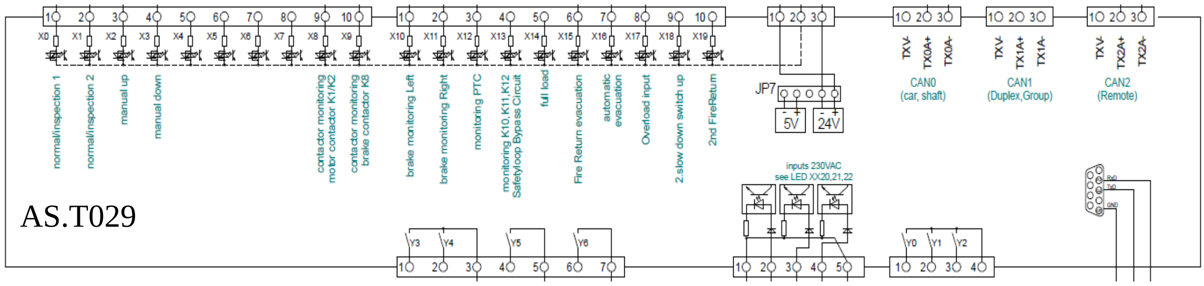


		name	date			
	created	M.Aicher	22.02.2013	magnetic sensor, shaft selector	No:	VA3.4
	last modif.				Page 50	Ver. 0



		name	date			
	created	M. Aicher	03.04.2013	magnetic sensor, Speed Sensor	No	VA3.4
	last modif.				page 52	Vers. 00

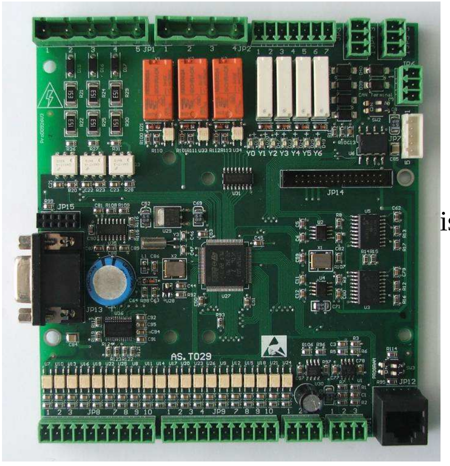
7.AS380 Main board AS.T029



Assignment of input/ Output:

The Inputs/ Outouts can be assigned -within defined limits-freely.

Sheme below shows how they are assigned in the very often cases. Individual signals could be assigned in special cases odifferent.



This will be underligned in the circuit sheme. Thus the circuit map is is applicable!

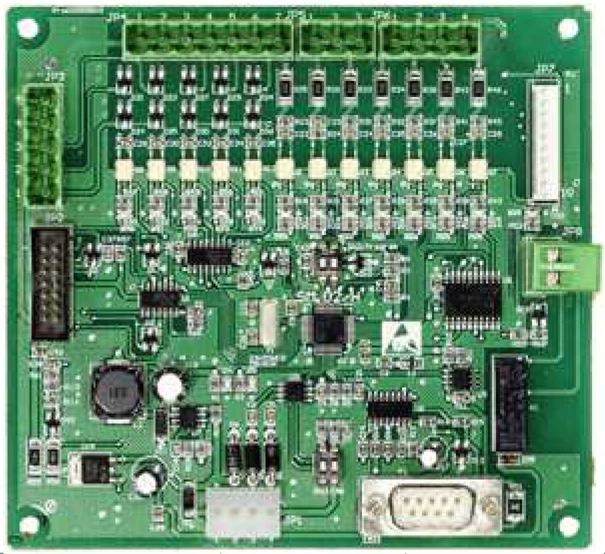
AS.T029 connections:

Terminal		*Name*	*Description*	*Function*	*Advise*
JP1	1	Nx1	Neutral wire main contactor from supply line	110V/ 230VAC- scan optocoupler. VDE EN81	
	2	X20	Scan emergencysection of safety loop		
	3	X21	Scan end of safety loop		
	4	X22	Scan revolving door contacts		
	5	Nx2	Neutral wire to the main contactors		
JP2	1	Y0	Open brake and keep open	Outputs main contactors conform EN81	
	2	Y1	Open brake (drops down to reduce brake tension)		
	3	Y2	Motor contactors		
	4	Y0-2	Common contact for output relais Y0-Y2		
JP3	1	Y3	Output for K14 (complete bypass)		
	2	Y4	Output evacuation end		
	3	Y3-4	common Y3 and Y4		
	4	Y5	Output fire/ firemanoperation active		
	5	Y5c	Common Y5		
	6	Y6	free		
	7	Y6c	common Y6		

Terminal		Name	Description	Function	Advise
JP4	1	V-	Mass CAN Bus 1 (intern)		
	2	TXA1+	CAN_H von CAN-Bus 1 inside the elevator	Datas	
	3	TXA1-	CAN_L von CAN-Bus 1 inside the elevator	Datas	
JP5	1	TXV-	Mass CAN Bus 1 (intern)		
	2	TXA0+	CAN_H of CAN-Bus 0 for group function	Datas	
	3	TXA0-	CAN_L von CAN-Bus 0 for group function	datas	
JP6	1	TXV-	Mass CAN Bus 1 (intern)		
	2	TXA1+	CAN_H von CAN-Bus 1 for remote monitoring	datas	
	3	TXA1-	CAN_L von CAN-Bus 1 for remote monitoring	Datas	
JP7	1	-5VIO	Internal tension 0V	nb	
	2	+5VIO	Internal tension +5V	nb	
	3		free		
	4	-24VIO	Internal tension 0V	JP8 + JP9	
	5	+24VIO	Internal tension +24V	JP8 + JP9	
JP8	1	X0	Signal 1 Inspection OFF or normal mode	input N	
	2	X1	Signal 2 Inspection OFF or normal mode	input N	
	3	X2	Inspection/return motion UP	input N	
	4	X3	Inspection/return motion DOWN	input N	
	5	X4	Delay switch upwards/ up	input N	
	6	X5	Delay switch downwards/ down	input N	
	7	X6	Re-levelling upwards /levelled	input N	
	8	X7	Re-levelling downwards/levelled	input N	
	9	X8	Motor contactor K1/K2 monitoring	input N	
	10	X9	Brake contactor K8 monitoring	input N	
JP9	1	X10	Brake monitoring 1	input N	
	2	X11	Brake monitoring 2	input N	
	3	X12	Motor-Temperature monitoring (PTC)	input N	
	4	X13	Doorzone signal monitoring security circuit	input N	
	5	X14	free	input N	
	6	X15	Fire/ fire departement	input N	
	7	X16	Automatic evacuation aktive	input N	
	8	X17	Overload Input	input N	Cable elevator
	9	X18	Delay switch upwards/up for v>2,5m/s, at short floor in the upmost stop.	Input N	
	10	X19	Delay switch ndownwards/ down for 2,5m/s, at short floor in the lowermost stop.	Input N	

Terminal		Name	Description	Function	Advise
JP10	1	+24V	24V internal		
	2	COM	Reference mass for optocoupler		
	3	GND	Reference mass for control	.	

8.SM02/H cartop box module



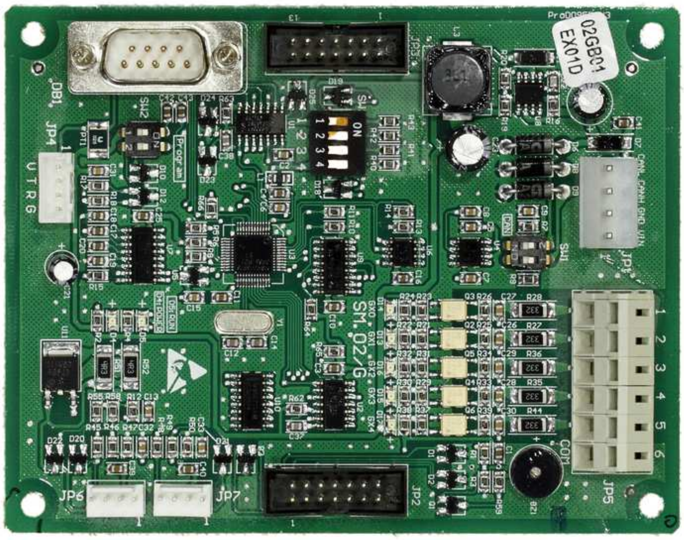
Terminal		*Name*	*Description*	*Function*	*Advise*
JP1	1	TXV+	+24V		
	2	TXV-	GND		
	3	TXA+	CANH		
	4	TXA-	CANL		
JP2	Terminal for extension board SM.09 IO/B				
JP3	1	COM	COM for HY0,HY1		
	2	HY0	Drive-in gong UP	Output TU	
	3	HY1	Drive -In gong down	Output TU	
	4	GND	GND		
	5	+24V	+24V		
JP4	1	COM	COM for HX0,HX1		
	2	HX0	End switch door open door A	Input N	
	3	HX1	End switch door close door B	Input N	
	4	COM	common for HY2-HY4		
	5	HY2	Scrambling door A	Output TU	
	6	HY3	door A closing	Output TU	
	7	HY4	Door A opening	Output TU	
JP5	1	COM	COM for HX2,HX3		
	2	HX2	Return motion switch door A	Input N	
	3	HX3	Light grid door A	Input N	
JP6	1	COM	COM for HX4-HX6		
	2	HX4	Monitoring cabin light	Input N	

Terminal		*Name*	*Description*	*Function*	*Advise*
	3	HX5	Full load	Input N	
	4	HX6	Overload	Input N	
JP7	1	D0	Voice announcement bit0	Output TN	
	2	D1	Voice announcement bit1	Output TN	
	3	D2	Voice announcement bit2	Output TN	
	4	D3	Voice announcement bit3	Output TN	
	5	D4	Voice announcement bit4	Output TN	
	6	D5	Voice announcement bit5	Output TN	
	7	D6	Voice announcement bit6	Output TN	
	8	D7	Voice announcement bit7	Output TN	
	9	GND			
	10	+24V			
JP8	1	COM	COM HY5	COM	
	2	HY5	Switch OFF cabinlight	Output relay	
DB1			RS232 serial interface		
SW1		SW1.1	Both ON for CAN-Bus Termination		
		SW1.2			
SW2		SW2.1	Both ON for Program Upload. Beide OFFfor Normal mode		
		SW2.2			

9.SM09IO/B Add-ON module

Klemme		***Name***	***Beschreibung***	***Funktion***	***Hinweis***
JP1			Connection to SM02/G or SM02/H		
JP2			Connection for additional SM09IO/B add-on-module		
JP3	1	HX7	End switch door open door B	Output relay	
	2	HX8	End switch door closed door B	Output relay	
	3	HX9	Return motion switch door B	Output relay	
	4	COM	COM for HX7-HX9	Output relay	
JP4	1	HX10	Light grid door B	Output relay	
	2	HX11	free	Output relay	
	3	COM	COM HX10-HX11	Output relay	
JP5	1	HX12	free	Output relay	
	2	COM	COM HX12	Output relay	
JP6	1	HY6	door B opening	Output relay	
	2	HY7	door B closing	Output relay	
	3	HY8	Scrambling door B	Output relay	
	4	COM	COM HY6-HY8		
JP7	1	HY9	End switch door open door B	Input N	
	2	COM	COM HY9		
JP8	1	HY10	free	Input N	
	2	COM	COM HY10		
JP9	1	HY11	free	Input N	
	2	COM	COM HY11		

10.SM02/G car panel board-module



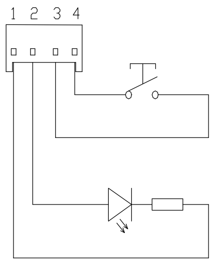
terminal		*Name*	*Description*	*Function*	*Advise*
JP1	1	TXV+	+24VDC	Relais-output.	
	2	TXV-	GND		
	3	TXA+	CANH	Relais-output	
	4	TXA-	CANL		
JP2			Connection for SM03 call board		
JP3			Connection for SM09IOB add-on-board		
JP4			Input cabin adjustment		
JP5	1	GX0	Button door keep OPEN (HOLD)	Input N	
	2	GX1	Special function	Input N	
	3	GX2	Priority inside	Input N	
	4	GX3	free	Input N	
	5	GX4	Firedepartement control key-switch	Input N	
	6	COM	COM 0V, GX0-GX4		
JP6	1	TY	LED Door-close-button Minus	Ausgang N	
	2	LED+	LED Door -open button Plus		
	3	GND	Door open button		
	4	GX5	Door open-button	Input N	
JP7	1	TY	LED Door close button minus	output N	
	2	LED+	LED Door close-button Plus		
	3	GND	Door close button		
	4	GX6	Door close button	Input N	
DB1			RS232 serial Interface		

<table>
<tr><th colspan="2">terminal</th><th>Name</th><th colspan="4">Description</th><th>Function</th><th>Advise</th></tr>
<tr><td rowspan="2">SW1</td><td colspan="2">SW1.1</td><td colspan="4" rowspan="2">Both on for turning on schedulig resistance for CAN</td><td></td><td></td></tr>
<tr><td colspan="2">SW1.1</td><td></td><td></td></tr>
<tr><td rowspan="2">SW2</td><td colspan="2">SW2.1</td><td colspan="4" rowspan="2">Both on for programm Upload.
Beide OFF for normal/ standard mode</td><td></td><td></td></tr>
<tr><td colspan="2">SW2.2</td><td></td><td></td></tr>
<tr><td rowspan="5">SW3</td><td></td><td>SW3.1</td><td>SW3.2</td><td>SW3.3</td><td>SW3.4</td><td>Typ cabin idicator board</td><td></td><td></td></tr>
<tr><td></td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>Standard-indicator board</td><td></td><td></td></tr>
<tr><td></td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>Idicator board B-selective door</td><td></td><td></td></tr>
<tr><td></td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>Desk indicator board</td><td></td><td></td></tr>
<tr><td></td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>Additional indicator baoard</td><td></td><td></td></tr>
</table>

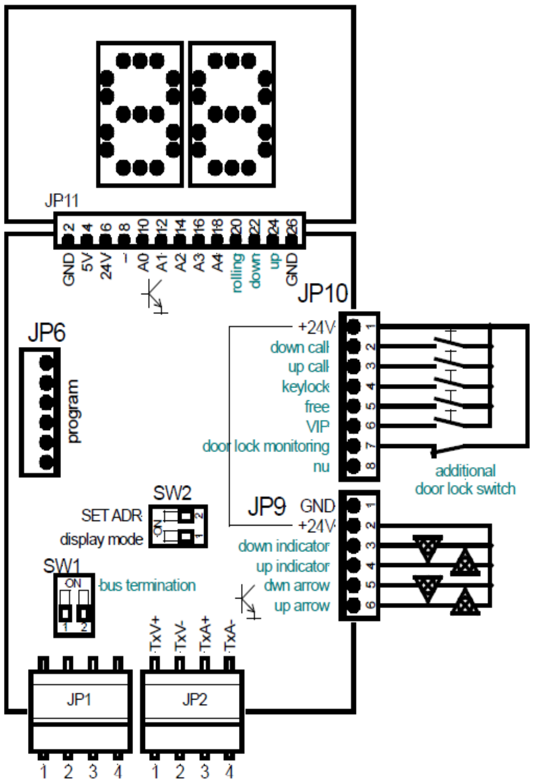
SM03 button-module

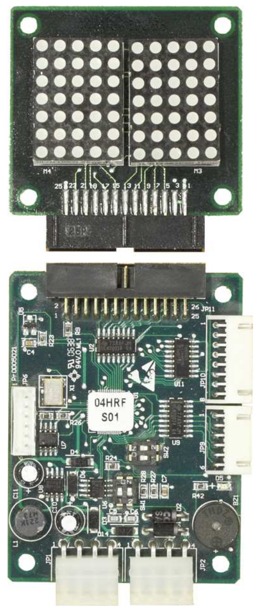
Up to eight SM03 each for 8 buttons (up to 64 floor buttons) could be connected

termina l	*SM03 Nr.1*	*SM03 Nr.2*	...	*SM03 Nr.8*
JP1	floor 1	floor 9	...	floor 57
JP2	floor 2	floor10	...	floor 58
JP3	floor 3	floor 11	...	floor 59
JP4	floor 4	floor 12	...	floor 60
JP5	floor 5	floor 13	...	floor 61
JP6	floor 6	floor 14	...	floor 62
JP7	floor 7	floor 15	...	floor 63
JP8	floor 8	floor 16	...	floor 64



11.SM04HRF floor module

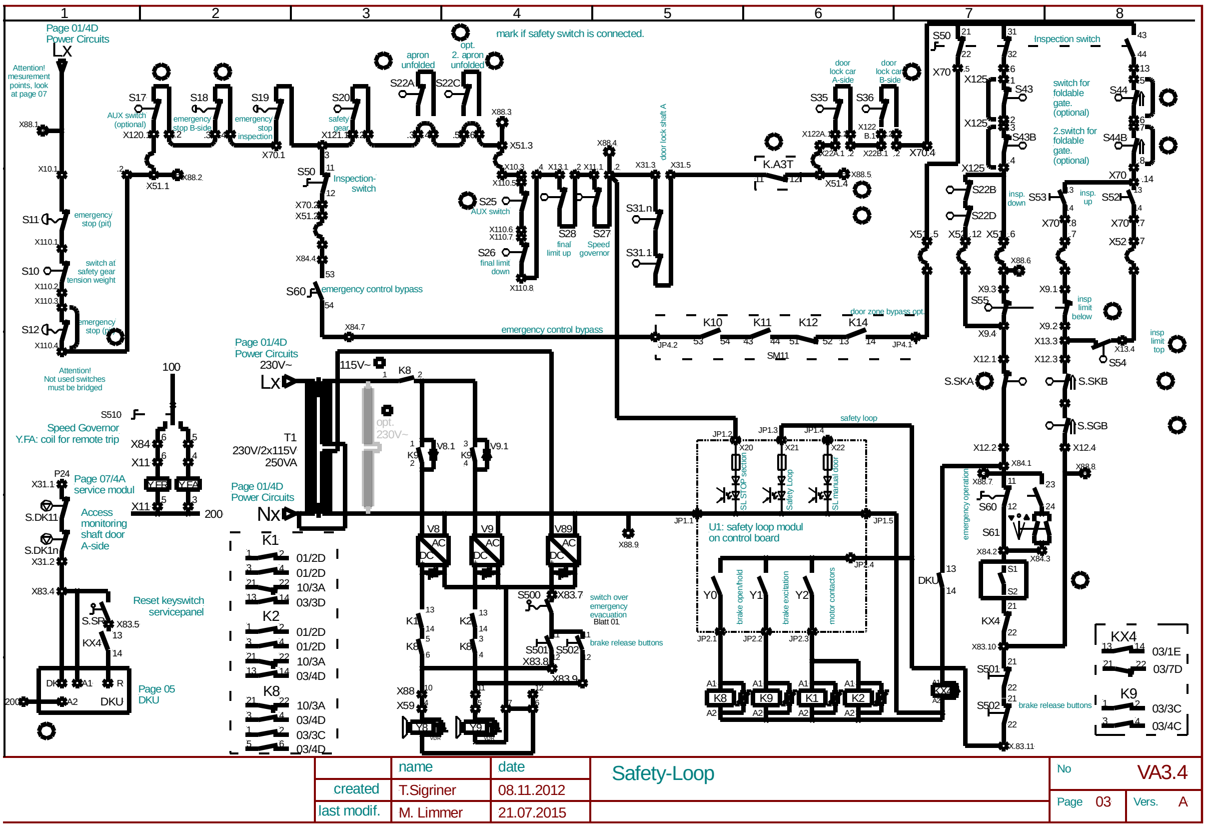




Pin		Beschreibung	Funktion	Hinweis
JP1 JP2	1	TXV+ +24V		
	2	TXV- 0V		
	3	TXA+ CAN_HI	Datas	
	4	TXA- CAN_LO	Datas	
JP9	1	0V Output		
	2	+24V Output		
	3	Hall Call downward	Outout NPN	Assignment can be different!
	4	Hall Call Upward	Outout NPN	
	5	Continued travel arrow downwards	Outout NPN	
	6	Continued travel arrow upwards	Outout NPN	
JP10	1	+24 for button (COM)		Assignment can be differen for special version! Eg light „occupied. Please state always the number of the device!
	2	Hall call downwards	Input P	
	3	Hall Call UP	Input P	
	4	Input „Parking“	Input P	
	5	Firedepartement control	Input P	
	6	VIP control	Input P	

Pin		Beschreibung	Funktion	Hinweis
	7	Door-locking-bolt-monitoring at anti-surf	Input P	
	8	Not in use	Input P	
JP11	2	GND		Instead of the STEP dot matrix display a display from other manufacturers could be connected with binary assignemt and common anode Set SW 2-1 to ON
	4	+5V output (max. 50mA)		
	6	+24V output (max.50mA)		
	8			
	10	A0	Output NPN	
	12	A1	Output NPN	
	14	A2	Output NPN	
	16	A3	Output NPN	
	18	A4	Output NPN	
	20	In Use/ lift runs	Output NPN	
	22	down	Output NPN	
	24	up	Output NPN	
	26	GND		
SW2	2	OFF: Normal; ON: via call UP nor down the adress on LED Display can be set..		
	1	OFF: STEP LED-displayAnzeige, ON: other display binary.		

12.Security Section



Security circuit

The safety circuit always builded up in the same way
and is devided into 3 sections for security switches:
Emergency stop contains all security switches, which are always activ, thus never are allowed to
be by-passed. This affects all emergency stop switches, the counterweight
switch, maintenace openings, etc.emergency control bypass contains all security switches, which get by-passed in return motion control,
thus safty gear, emergency-end-switch, speed restrictor.
doorzonenbypass contains all blocking switches of
the shaft doors and the door contacts of the
cabin doors.
At the end of the security circuit is the inspections- and return motion control.

Optional security switch

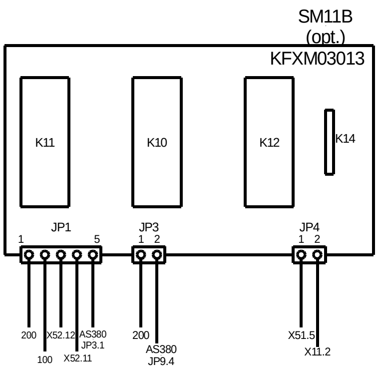
In the connection scheme all popular security switches drawn in. Security switches which are not always necessary, like blocking switch of the B-door, are drawn in as optional. If it is availble it have to be marked on the connection scheme and certainly also connected.The terminals for optional security switches are factory-provided by-passed with wire-bridge. So it is secured, that the bridge get removed by connection of a switch

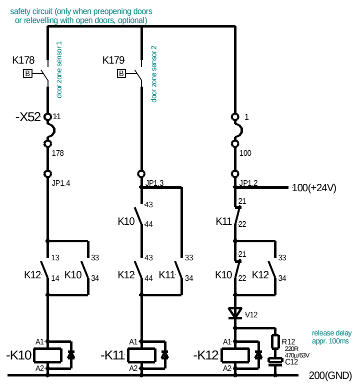
Matter: By-passing of security-circuits

Basically it is not allowed to make security circuits effectless per by-passing.
But it is not possible to install a lift without
by-passing temporarily parts of the security circuits.
Only use wire-bridges for by-passing, which you install at the terminals for the security switches. With this handling in any case the bridge will be removed when you install the switch. Never use shorting plug bridges – you might forget these conventionally! As wire, please use an eye-catching one, but not the greenyellow colored one! Please also avoid to have these too long (they should not look out of the cabinet) – in worst case somebody is closing the door and you may have 230V of the secuirity circuit at the cabinet

Security circuit

The security circuit is only needed, if re-levelling with open or pre-operating doors is required! For hydraulic lifts is due to the re-levelling the security circuit mandantory! The assignment of the security circuit are two sensors, which are operating independent one from the other, to recognize where the door zones are, to compare the datas and respectivley make it possible to by-pass the door contacts within the door zones or not. For instance it should be attained the security of a castor security switch. The security circuit is based on the common principle of the strip circuit. Every circuit switch part have to change it´s attitude in order to make an alliance possible





Components

K10, K11 and K12 are contactor or security-relays with positively driven contacts. If a closer bonds, the opener stay open and contrarywise.

K10 allocated to the sensor B178 of door zone 1
K11 allocated to the sensor B179 of door zone 2
K12 monitoring of K10/B178 and K11/B 179
K14 relay without security function, allows the controller the disconnection of the bridge
S50 security contact in inspection switch. By this is avoided that bypass occurs during inspection!

Functionality

Initial position: Lift outside of the doorzone

K10 and K11 dropped-out, K12 tightened.
Lift runs in door zone: B178 and B179 get closed successive or simultaneous.
First K10, than K11 activates. K12 drop-out after activation of K11.

by-pass
completed.
R12 and C12 delay the depression of K12 for max. 100ms, in order to make
lock K11 possible.

Lift is leaving door zone: B178 and B179 opens, K10 and K11 depresses, K12 activate.

Possible sources of error:

Error	Simulation	Action during early opening door door mopens in doorzone
B178 discontinued/K10not actuated	Pinch off X52.11 or B178	No by-pass.Elevator stops in doorzone
B179 discontinued/K11not actuated	Pinch off X52.12 or B179	No by-pass.Elevator stops in doorzone
B178 hot-äöwired/K10 not depressing	By-passing K178 while leaving door zone or bypas between. X52.11 u. X52.1	While leaving door zone K11 is depressing. K12 not actuates anymore.at the next run K11 is not actuation anymore Lift make stop at the open door➔ EMERGENCY STOP
B179 hot-wired/K11 not depressing	While leaving doorzone -Bypassing K179 or bypassing between X52.12 u. X52.1	While leaving door zone K10 is depressing. K12 is not actuating anymore. At the next run K10 is not actuating anymoreLift make stop opening door ➔ EMERGENCY STOP

According to EN81 14.1.1 one single error do not lead to a dangerous operating conditon and will be recognized, as the lift will make an emergency stop by disconnecting the security circuit while opening the door within a door zone. In addition there is existing a further monitoring done by the controller.
Dependent up on the re-levelling sensors, which are independent from the door zone sensors, K14 is activated.

In the unlikely case, that both door-zone-sensors by leaving the door zone would be hot-wired, a by-pass outside of the door zone will be avoided by the circuit via K14.

Additional Monitoring by control

The controller is monitoring via K10, K11, and K12 the security circuit. During the journey the contact chain have to be closed once inside the door zone and have to be opend once outside the door zone. In case of an error, the installation will be shut down at the next stop with error message. Part of encoder

Scan control at the security circuit

On the board SM01 F5021 there are 4 inputs for 230V. These are installed according to the requirements of EN81 at scan controls for security circuits. This is confirmed by TÜV with a confirmation assessment. Basically the circuit consist of pre-resistors, protection diodes and optocoupler with VDE-approbation.

It is executed the terms accourding to EN81 for a secure disconnection of the 230VAC-page from the 24VDC-page as well as for exclusion of errors

N-wire

The N-wire of the security contactor , means motor contactor K1 and K2, as well the brake contactor K8 and maybe K8 have to be controlled via the board! At a N-wire-breakage the contactor than have the necessity of drop-out, independent of the theoretical possible chance of a hot-wire in the optocouplers which may make a partial by-pass of the security circuit possible

check

Connect the controller free of voltage! With the continuity checker between N-input terminal and A2 (N-terminal) of security contactor (K1, K2,K3, K8), check the run.With a pluged JP11(main board) you have a run, with pultruded JP11 there must not be any run..

Pilot relay

On the board SM01sup (F5021) there are also 4 pilot relays for security contactors . This part of circuit is also confirmation checked, means it is possible to connect directly the end of the security circle, the security contactore sources their controller voltage directly out of the security circle.
The security contactors, motor contactors K1 and K2, as well the brake contactor K8 are seperatly monitored. If there is one of the contactors is not depressed before a journey, the control get´s blocked and have tho be reseted manually

Monitoring of run

SmartCom F5021 is monitoring via the encoder of the engine and the re-levelling-sensors the reactions of the lift in regards on the driving commands to the inverter. If there are signals missing, the drive get´s shut-down, latest after 20sec. .Restart of journey only possible after reset of the main board.

CHECK

1. Advise the lift to drive from the lowest to the topmost stop and do the unplug JP7 respectively JP8 (Encoder-inputs) at the main board. The lift have to be shut dwon after arround 20 sec.

2. Uninstall 170 or 171 (re-levelling-sensors). After arround 20sec. re-levelling the lift get shut dwon.
You easily can set diving commands via the status window “Call.Func“.For short lifts 20sec. may be a long time frame. In this case you could reduce temporarily the parameter“Monitoring of journey“ via the menu “parameter-group F“ in order to simplify the checking

13.Advice of acceptance test

Lift controller of STEP Sigriner Elektronik GmbH are manufactured and checked with EN81 and VDE-standards. The used components, especially the main- and auxiliary contactors are selected respectively to the requirements of EN81, VDE0100, VDE0660.
All adjustable components, like engine-security-switch,frequency inverter etc. are allready pre-adjusted by us as far as possible. It is incumbent upon the installing company to adjust these components before implementation with respect to the resources..

By default the security cycle is fused with a power protection switch withF2 (2A Charakteristik C).
As amaximum a power protection switch with 4A can be used.

Generally

Keep doors closed:	To check troublefree the doors could be blocked withF165 bit1=1
Inspection run:	has always priority before return motion and it is also possible with activated return motion control. The by-pass of the security switch is deactivated. With F76 and F77 virtuell inspection-end-switches could be set. This to avoid that accidently the fold support in the fosse are overrunned. As soon as the shaft copying isn't completly engaged set bith values on „0“. within the doorzone with AUF/ Zu button the function of the doors could be checked. Otherwise during inspection run doors are always closed.
Return motion run:	this is only possible with deactivated inspection control. Appropriate security switches, like emergency-end-switch, arrester-switch etc. will be by-passed. The return motion is also stopped by the virtual inspection end switches F76/77.
Cabin light:	If failure of cabin light (simulation F02) the lift stops at next floor and door opens.
Motor temperature	A PTC switch-OFF leads as well to a shut down at the next possible stop.

Isolation measurement:

By default the controller undergo a isolation masurement in the factory. The IN-SITU arranged measurement refers only to the connected ressources of the lift

Please respect imperativly the safety regulations while executing this procedures. There is danger for limb and life !

In order to avoid damages of the controller, switch off the respective fuse F2 at the controller for measurements. Connection of frequency inverter, USV-systems and other systems with power semiconductors and filter, most likely have to be disconnected or hot-wired according to manufacturers for testing purpose. For this follow the advises of the manufactures.

Inccorect done isolation measurement can provoque extensive danger. STEP-Sigriner Elektronik GmbH is not liable for any damage!

Mainly applies:

- Remove the yellow-green bridge circuit between mass (200) and ground (PE)
- check wether mass is now free of ground -with ohmmeter
- inverters, door control facilities disconnect if applicable.
- Is there still connection between mass and ground while bridge (200 to GND) is disconnected, please check door control devices, light grids, and load detectors. Those devices often has internal internal ground connections and had to be isolated.
- Now an isolation measurement could be executed riskless, as far as it is always measured aginst ground.

Check of run-time monitoring:

In normal mode in menu Commission>Test Menu>Drive T. Test activate. The parameter for the run-time is now temporarily reduced to 2sec. and a command is send. The elevator starts and should make after 2 sec an emergency stop.

End switch movement:

First set F79 Bit 1 to allow an overrun over the virtual end-switches.

Send elevator in normal mode into uppermost and lowermost floors.

For this activate in menu Commissioning>Test Menu> Up Limit Test or Dn Limit .

The elevator runs now up or down until security loop is opened.

The distance from the levelposition is displayed..

With return-motion control the elevator could be moved over the end switches to test his traction.

F79 Bit1 wieder auf 0 setzen.

Effectiveness of the brakes (one-sided brake)

Switch in normal mode the power supply to USV (Service-Panel).

Send elevator from lowermost floor up (via call). When nominal speed is reached push one of the brake-buttons and hold. Elevator makes emergency Stop, even one brake is disengeged via the button, though elevator has to stop.

Test the same with the other brake.

Contactor monitoring:

Change with parameter F25 temporarily the Input orientation (NC/NO) for X8 (contactor Motor) and then X9 (contactor Brake) . control has to detect latest at next move an error and give out error message.

Brake monitoring switch:

Check switches of brake monitoring either through displug or temporarily change of input orientation from X10 und X11 in parameter F25 .

Measurements in security circuit

The security circuit is monitored via a residual current circuit breaker and a 2A or 4a fuse.

The measurement of the loop resistance through the RCI is not possible or doesn't make sense. Because of the leak current of 30mA is the loop resistance is this benign. It is crucial that the RCI disconnect above 30mA if the test is made from any point against ground.,

This could be made with a test device or an adapted DUSPOL

Due to the desigh of the elevator the security circuit is not easy to acced. Thats way important measurepoints are brought to the service panel via X88 .

On sheet 3 on circuit diagramm you find important advices.

Triangle monitoring „DKU“

Backround

This device has to perform following task. As soon as somebody wants to enter the cabin and opens the shaft door with the triangle key the elevator has to stop.

So it is prevented that somebody is hurt, if he entered the shaft without stopping the elevator by the emergency stop.If he had entered and the door is closing behind him giving free the elevator.

When there is a short fosse or short head the DKU is a temporarily tool to errect the fold support or brakets.

Furthermore by using the DKU the housing of counterweight is not neccessary and it is taken in account the inspection control conform the EN81-20

Functional principle

Generally the DKU consists of a relay circuit in lock (maintained command) via the monitor switches of the triangle lock-release.

The monitor switches ares in a normal open configuration.and arranged in a serial circuit.. so as soon as one triangle is opened the relais depress and the circuit is open.

For a short fosse, missing hausing of counterweight or missing Inspection control one contact in the shaft door is enough. When head of shaft is shortened, every shaft door has to have a contact!

The power supply of DKU has to be battery backed- this to prevent a triggering when power failure.

Functional check

The elevator is in normal mode and ready .

Checking of effectiveness from „DKU“

Unlock one of the monitored doors. Opening the door is not neccessary.

Now the elevator should not move neither by call or return-run button.

After apply of SSR at service Panel the elevator should move.

Repeat this check for every door under surveillance of DKU.

Simulation of „sticking“ Reset button

Hold the SSR pushed. The elevator should not move in normal mode or return move.

After release the elevator should move .

Check of the Inspection control

***Attentio**n Imperatively respect the following:*

Allways set emergencvy stop before entering shaft or cabinceiling. This avoids accidents if test comes out negativ..

Move the elevator with return move in one floor so that you could enter the cabintop.

If applicable erect the fold support in the fosse into protect position.

Now the elevator should move with the inspection control on the top or in the fosse.

Shut down the inspection, leave the fosse and keep the fold support in position.

Check Reset only possible with nonactive folded support

Try to reset DKU when door is closed.. this shouldn't be possible, means elevator cannot move -

not in normal mode or return move.

When there is no shortened fosse the reset could be made when closing all shaft doors.

Put now back the fold support in normal mode position. Protected area deactivated..

Leave the fosse and close shaft door(s).

final check

the elevator should not move-not in normal mode nor in return mode.

Actuate SSR. Now the elevator should move..

Instruction for A3 check

General

application of the instruction

these instruction completes the general Control manual at the matter A3 protection for accidental movement(UCM).

Please notic also the advices in the manual for the control AS380.

The system bases on the security circuit SM011B, which is for the bypass of the door contacts for relevelling with open door or preopening door and for detection of uncontrolled leave of the doorzone and for the shut down of the motorbrake.

security

to assume that:

- the elevator facility is installed accordingly the regulations of the manufacturer and ready for operation
- The facility has a service braking device or an additional brake which can be used as a A3 brake and can be piloted from the security circuit.
- Alle Persons which are consigned with the installation, and checking of the facility has the required knowledge and skills also especially regarding the electrical and mechanical hazards from elevators..
- to remind: In a elevator facility are hazards by electrical strokes, via the mecanic (crushing, cropping) etc and furthermore hazards through the design drop, fall etc.
- Important: do not only think at you, but on people which could be in the danger zone!
- During the execution of tests think also on the possibiliy of failure. Thats way at no time somebody should stay in the danger zone.

Functional principle

Introduction:

When the cabin is leaving the doorzone the security loop is opening when cabin door opens and the brake at the end of the security circuit connected actuates. By this the cabin is braking down.

This brake could be an approved A3service brake or an additional brake.

Through a good design of the lenght of the doorzone and the brake characteristic should be ashured that the braking distance goes below the required braking distance.

This is made by calculation and the practical test on each facility.

The detection of an uncontrolled movement is independant from the control.

General function check:

The UCM-Function is tested with closed door in a levelled position.

To check this function the K14 is to actuate. This close the bridge from the door. Simultanely the part of the doorcontacts is opened via a testrelay (K.A3T) to simulate an open door.

The doors stay closed to avoid hazard if the test fails.

Functional check-Version A with trundle (via check menu):

These procedure is only designated for cable elevator with gearless drives.(synchronous motors) and simulates the case of a noncontrolled trundle.

The paces for checking of UCM Function are integrated in the software of the AS380 control means the test-relay K.A3T and K14 is directly triggered.

- Elevator is ready for operation in a middle floor.
- Doors are closed.
- Now activate in the menu Test the UCM Test A
- via the Testrelay K.A3T the door circuit is opened to check when door is closed. K14 is avtivated to close the bridging.
- Now K2 (Motorcontactor) and K8 (Brakecontactor) is actuated.
- The elevator trundles up (cabin empty) or down (cabin loaded).
- After leaving the doorzone the elevator has to stop!
- The elevator has to come to a stop within the limit values.
- The passed distance is indicated on the display or can be measured after the opening from the shaftdoor.
- If the elevator trundles away more than 2m the test has to be aborted.

Functional-check Version B with inverter (via check-menu):

these procedure is designated for cable elevator with gear drives.(asynchronous motors) and simulates the movement with defined acceleration (caused by the inverter)

The paces for checking of UCM Function are integrated in the software of the AS380 control means the test-relay K.A3T and K14 is directly triggered.

- Elevator is ready for operation in a middle floor.
- Doors are closed.
- Now activate in the menu Test the UCM Test B
- via the Testrelay K.A3T the door circuit is opened to check when door is closed. K14 is avtivated to close the bridging.
- Now a normal run Up (empty cabin) or down (loaded cabin) acuated.
- After leaving the doorzone the elevator has to stop!.
- The elevator has to come to a stop within the limit values.
- The passed distance is indicated on the display or can be measured after the opening from the shaftdoor.
- If the elevator trundles away more than 2m the test has to be aborted.
- With the below shown calculations the maximal breaking distances can be calculated. Basis is the set acceleration.

- The measured braking distance should be considerably below the calculated one!
- By calculating the braking distance for the worst case can be established.This has to be below the permissible limits.

Example: Calculation of the braking distance

input values:

Max. average acceleration: a = 2500mm/s² (z.B. max. possible acceleration)

lenghts of doorzone Xa = 110mm ➔ lenghts of magnet 150mm - 40mm

Response time system SM011B inkl. Cont. Te= 40ms ➔ 9ms +30ms contactor

Response time Brake Tb = 200ms ➔ dependant of the used brake

average deceleration = 2000mm/s2 ➔ dependant of the used brake

calculation of time until doorzone is left (detection time-leaving doorzone)

$$Tt = \sqrt{\frac{2 * Xa}{a}} = \sqrt{\frac{2 * 110\text{mm}}{2500\text{mm}/s^2}}$$

Tt = 0,3s

calculation og ther total response time Tr (detection+electronic+brake)

Tr = Tt+Te+Tb

Tr= 0,3s + 0,04s + 0,2s = 0,54s

calculation of covered distance Xb during total response time Tr:

Xb = 0,5 * a * Tr² = 0,5 * 2500mm/s² * (0,54s)² = 364,5mm

calculation of the max. acomplished speed Vmax:

Vmax = a * Tr = 2500mm/s² * 0,54s = 1350mm/s

calculation of the stoppimng distance Xd:

$$Xd = Xb + \frac{Vmax^2}{2 * ab} = 364{,}5\,mm + \frac{(1350\text{mm}/s)^2}{2 * 2000\text{mm}/s^2} = 820{,}2\,mm$$

A3 would be met for this example.

Supplemental documents

verification certificate SM011B

- circuit plan with AS380

14.Parameterlist

No.	name	description	Factory setup	scope
F00	Acceleration slope	acceleratioin	0.55m/s²	0.2~1.5
F01	Deceleration slope	deceleration	0.55m/s²	0.2~1.5
F02	S Jerk T0	Rounding start	1.300s	0.2~3.0
F03	S Jerk T1	Rounding transition to constant run	1.100s	0.2~3.0
F04	S Jerk T2	Rounding beginning of decelerationphase	1.100s	0.2~3.0
F05	S Jerk T3	Rounding during stop	1.300s	0.2~3.0
F06	Nominal speed	Nominal speed elevator	1.75m/s	0.1～10
F07	free			
F08	free			
F09	Parking floor	Parking floor	1	1～48(64)
F10	Offset floor	Offset floor for elevator groups	0	0～48(64)
F11	Floor number	Number of floors	18	2～48(64)
F12	Inspection speed.	Speed during inspection	0.250m/s	0~0.630
F13	Creeping speed	Creeping speed	0.060m/s	0.010~0.150
F14	Closing delay1	Response to hall call	3.0s	0～30.0
F15	Closing delay2	Response to hall call	3.0s	0～30.0
F16	Brake delay.	Delay between FU Run Signal and Brake contactor on	0.2s	0～2.0s
F17	Automatic enable signal release time	Delay between brake contactor OFF to inverter Stop	0.6s	0.2～3.0
F18	Fire floor	Fire floor 1	1	1～48(64)
F19	free			
F20	Base floor return delay	Delay until <F22>) 0：no parking run	0s	0～600
F21	V0 Stop Distance	Leveling switch motion delay distance (full-speed)	6mm	2～40
F22	Single and duplex return to base station	Single and duplex return to base station (F20)	1	1～48(64)
F23	Group control mode	Group function 0 : Master 1 : Slave (Duplex) 2 : Group control 3 : Ringgroup(F181 = Nr. in the group)???	0	0～3
F24	actuation FU	Actuation inverter 0: Multistep ; 1: analogue	0	0～5
F25	Input Type X0-15	Input type 1 (normal open or close setup for X0~X15 input point		0～65535
F26	Input Type X16-32	Input type 2 (normal open or close setup for input pointX16-X25		0～65535
F27	Input Type GX0-15	Elevator car board input type (normal open or close setup for GX0~GX15)		0～65535

No.	name	description	Factory setup	scope
F28	Input Type HX0-15	Car roof input type (normal open or close setup for HX0~HX15)		0～65535
F29	Service floor0-16	Setup if 1~16 floors are secure		0～65535
F30	Service floor 17-32	Setup if 17 – 32 floors are secure		0～65535
F31	Service floor 33-48	Setup if 33 – 48 floors are secure		0～65535
F32	free			
F33	Number interv.	Automatic operation interval for testruns 0: no test runs	5s	0～65535
F34	Number testruns	Time between calls for test runs (random calls) 0: no function	0	0～65535
F35	Firefighting switch	Firefight input switch defintion and firefight mode selection EN81-71 fire control 2：without key in cabin 3：with key in cabin Pubel (RUS) firecontrol (russian) 4：without key in cabin 5：with key in cabin		0~5
F36	Brake switch M.	Standby time for brake monitor switch 0：no brake monitoring 1 : Standard brake monitoring 2 : Hongkong Version	1	0～2
F37	Password 1	Password 1		
F38	Password 2	Password 2		
F39	Password 3	Password 3		
F40	load Offset	Load data bias	50.0%	0.1~99.9
F41	Load larning	Load study and parameter setup	0	-
F42	free			
F43	Attendant mode	Flashing function selection for attendant status call	3	-
F44	RS485 Adress	Adress for remote monitoring via 5 network: 255 for non-monitor	255	0～255
F45	free			
F46	free			
F47	free			
F48	free			
F49	EVA-Mode	Emergency levelling orientation mode	0	0~2
F50	A-door 1-16	Front door opening permission floors 1~16	65535	0～65535
F51	A-door 17-32	Front door opening permission floors 17-32	65535	0～65535
F52	A-door 33-48	Front door opening permission floors33-48	65535	0～65535
F53	B-Door 1-16	Rear opening permission floors 1-16	0	0～65535
F54	B-door16 -32	Rear opening permission floors 17-32	0	0～65535
F55	B-door 32-48	Rear opening permission floors 33-48	0	0～65535

No.	name	description	Factory setup	scope
F56	UP levelling adjustment	Fine tuning for stop UP: 50 for directrun, >100 for creep run	50mm	0～240
F57	Down levelling adjustment	Fine tuning for stop DOWN:0 for directrun, >100 for creep run	50mm	0～240
F58	free			
F59	Zero speed brake delay	Delay beween inverter STOP command and brake contactor OFF	0,00s	0~10.00s
F60	free			
F61	Gong Output delay	Arrival distance for arrival gong	1200mm	0～4000
F62	Anti-slipping time limit	Time for anti-slipping	32s	2～45
F63	free			
F64	free			
F65	Base Block Mode	Block: 0- no block, 1- block, when motor contactor deactivates	0	0-1
F66	Limit Mode		0	0～65535
F67	Additional board	Activating for add. Boards for main board	0	0～65535
F68	free			
F69	free			
F70	Idle reg. UP	Empty load compensation direction UP	100,00%	0.1~99.9
F71	Idle reg. Down	Empty load compensation direction DOWN	100,00%	0.1~99.9
F72	Full load reg. UP	FULL load compensation direction UP	100,00%	0.1~99.9
F73	Full load reg. Down	FULL load compensation direction UP	100,00%	0.1~99.9
F74	Empty load reg		512	0～65535
F75	Full load reg.		512	0～65535
F76	Lim. UpDis. Ins.		0cm	0～65535
F77	Lim. DnDis. Ins.		0cm	0～65535
F78	Endswitch M.			
F79	Insp. ES Mode	Moving of cabin beyond end switch for insp. (Test Endswitch & traction) 0: no 1: enabled	0	0~1
F80	Door quitt. Mode	Setting button beep and flashing for call buttons Bit 1: button-beep Bit 2: flashing from cabin call when arrival Bit 3: flashing of hall callt Bit 4 beeping when passing floor for blind people	0	0~15
F81	Bright dark mode	Brightness of confirmation for cabin -&hall call if not acknowleged: The lower 4 Bits define the brightness of outside/ hall acknowledgements, the other 4Bits the brightness of cabin confirmations there are 9 grades of brightness.	0	0~255

No.	name	description	Factory setup	scope
F82	Sleep-Function	Setting time until control switch into Sleepmode. (only with additional modul) notice : Sleepmode = T in F152 + T in F82 0 = no Sleepmode	0s	0~65535s
F83	Car call mode	0: General 1: selektive door 2xSM03 1 x SM02G limited up to max 8stops A-side: Adress 1-8, B-Side Adress 9-16!		
F84	Insp. to normal	F84=1: Reset from inspection to normal mode has to be confirmed on the handtool F84=0 No confirmation need	0	0~1
F85	Taxi-Steuerung	F85=0: deactivated F85=1: activated	0	0~1
F86	VIP Function	Penthousefunction and priority for hall 0: priority for hall >0: VIP delay time	0s	0~300s
F87	Monitorin re-levelling	Tolerance of errors for security circuit adjustable: If error occurs the control shutoff facility after 1 to 9 error (value F87) for TÜV check set to „1“	1	1~9
F88	free			
F89	free			
F90	free			
F91	free			
F93	free			
F94	free			
F95	free			
F96	free			
F97	free			
F98	free			
F99	free			
F100	free			
F101	free			
F102	free			
F103	free			
F104	free			
F105	free			
F106	free			
F107	free			
F108	free			
F109	free			
F110	free			
F111	free			

No.	name	description	Factory setup	scope
F112	free			
F113	Main floor	Main floor(Hotel version)	0	0～48(64)
F114	free			
F115	Door close time limit	Door run time close (in case of no end-switch)	15s	3～30
F116	Door open time limit	Door run time open (in case of no end-switch)	15s	3～30
F117	Holding time	Door-open time frame after pushing the keep-door-open-button	60s	0～255
F118	Holding time for the handicapped	Door-open time frame after pushing the keep-door-open-button for disabled person	30s	0～255
F119	Priority mode	Door mode if priority inside: 0: Hold door close button for closing the door 1: door make close after command	0	
F120	Number of registrations an-nuisance	Violation detection interior call 0:no function 1Stop without erasing light grid command 2~20max. Number of accepted commands at the same time when empty load TX7 (cabin empty) is active		0～20
F121	Forced door-closing enable	Door scrambling: 0:off 1:on		0～1
F122	Run enable delay	Time between break off and FU drive signal off (speed and direction).	0.0s	0~10.00
F123	Hall call classification	Type of existing exterior-calls 0 : only simple calls (not selective) 1 : Selective doors: SM-04 address 49~96 for B-door exterior-calls. 2 : calls for disabled persons: SM-04 address 49~96 for disabled person exterior-call (priority). 3 : Selective door and disabled-person-calls: SM-04 address 33~64 for B-door calls, 65~96 for disabled person-calls (priority		0~4
F124	free			
F125	free			

No.	name	description	Factory setup	scope
F126	free			
F127	free			
F128	Front and rear door operate mode	Door mode at two doors 0 : selective door control active 1 : both doors controlled together		0～3
F129	Relevelling with door open and/or pre-open door Enable	re-levelling with open door/ prerunning door opening (requires security circuit): 0 : no security circuit 1 : prerunning door 2 : re-levelling with open door 3 : both		0～7
F130	Holding door-opening/closing torque.	Door triggering (keep close/open): 0 : no close/open-keeping Bit 1 : door open-keeping (in case cabin door is pulled by the shaft door) Bit 2 : door close-keeping (in case the bolt opens without keep-close-moment) Bit 3 : keep close during the journey (in case tie bolt bangs against the locking bolt) Bit 4 : no door-close-end-switch Bit 5 : AT120 door control Bit 6 : revolving door	0	0～7
F131	Block floor no	blockable floors 0: not active 1～64: number of the floor which have to be blocked.		0～64
F132	block floor start time	Time at which the floor <F131> should be closed: e.g. 730 for 7:30 o´clock		0～65535
F133	block floor end time	Time at which the floor <F131> should be released. e.g.: 930 for 9:30 o`clock		0～65535
F134	free			
F135	free			
F136	free			
F137	NS-SW floor16	Defines floors, which can be blocked with a key-switch: Bit mask 1-16		0～65535
F138	NS-SW floor32	Bitmask 17-32		0～65535
F139	NS-SW floo48	Bitmask 33-48		0～65535
F140	free			
F141	Motor contactor off delay	Caster time of engine contactor : approval off=>contactor off	0.5s	0.5~10.00

No.	name	description	Factory setup	scope
F142	free			
F143	free			
F144	free			
F145	DC Gain	Regulation from bus tension	100,00%	80~120
F146	Pos.error Dis.	Regulation of pos distance	180mm	180~1000
F147	Monitor mot contactor	Monitorin contactor motor 1: ON 0: OFF	1	0~1
F148	free			
F149	free			
F150	free			
F151	free			
F152	Cabin lifght /fan delay	Caster time for cabin light/ fan after the last run	180s	0～65535
F153	Monitor door lock	Monitor door lock 0: OFF 1: ON	0	0~1
F154	free			
F155	free			
F156	Security circuit detection	Security circuit detection 0: with add relay (only for Asia) 1: Standard only via high voltage inputs	1	0~1
F157	free			
F158	free			
F159	free			
F160	Cancel Call mode	Cancel call permitted/ not permitted	1	0～1
F161	Block floor during time	Blocking of floors (F137,F138,F139) 0: no blocking 1: block with time F131 2: blocking with key-switch		0～1
F162	free			
F163	USV mode	Operation with emergency supply 0: no 1: possible		0～1
F164	Load device type	Type of load device and ~compensation during start of inverter	99	0～99
F165	Door open selection	Door open functionality: Bit 0: no open/close during inspection. Bit 1: no opening of the door during test-operation Bit 2: door A basic position open at main stop Bit 3: door A basic position open at every stop		0～65535

No.	name	description	Factory setup	scope
F166	Dr SpecialOverT		52s	0～65535
F167	free			
F168	Lift numbering for IC card service	approved 0: no card reader 1~255 Adress of elevator		0～255
F169	RFID call type	RFID generates 0- down calls 1- UP calls		0～1
F170	RFID .1-16	Floors which are only approved with RFID: Bit mask Interior calls 1~16		0～65535
F171	RFID Freig.17-32	Floors which are only approved with RFID: Bit mask Interior calls 17~32		0～65535
F172	IRFID Freig.33-48	Floors which are only approved with RFID: Bit mask Interior calls 33~48		0～65535
F173	free			
F174	free			
F175	Start creep speed	Start creep speed	0.006m/s	0～0.100
F176	free			
F177	free			
F178	free			
F179	free			
F180	Speed gain	Assignment of the nominal speed of the lift with top values of the analog outputs. 50.0% - 150.0%, standard 100%	100.0%	0～150
F181	Duplex Nr.	Number of the lift within a group: smallest number have highest priority (F32=3		0～7
F182	Steps of speedn reduction	Number of driving-steps, which are used for stopping (only at Multistep-control)	0	0～10
F183	Speed self-learning analogue	Speed at self learning mode	0.800m/s	0～1.000
F184	free			
F185	free			
F186	Creeping time at start	Creeping time at start note also F175	0.50s	0～10.00

No.	name	description	Factory setup	scope
F187	CAN Monitor	Status Überwachung 0：run counterer 1：malfunction of encoder 2：CAN-Bus 1 malfunction 3：CAN-Bus 2 malfunction 4：revolution RPM 5：tension intermediate circuit 6：output current motor 7：Torque		0～7
F188	free			
F189	free			
F190	floors 49-64	Floor permission 49-64	65535	0～65535
F191	A-door49-64	Permission door A at floors 49-64	65535	0～65535
F192	B-door 49-64	Permission door B at floors 49-64	0	0～65535
F193	free			
F194	free			
F195	free			
F196	2. main landing duplex control	2. main stop at duplexx		1～48 (64)
F197	free			
F198	free			
F199	NS-Etage 49-64	Blockable floor bitmask 49-64		0～65535
F200	SW Version	Software Version of inverter	x	
F201	Inverter	Inverter modes: 0: V/F Mode 1: Vector Mode without encoder (only test) 2: torque mode with encoder 3: Vector Mode with encoder	3	0~3
F202	Motortype	Motor-Type 0: Asynchronous motor 1: Synchronous motor	0	0～1
F203	Nominated motor power	Nominated motor power	x	0.4~160kW
F204	Nominated motor current	Nominated motor current	x	0.0~300.0A
F205	Nominated motor frequency	Nominated motor frequency	50Hz	0.0~120.0
F206	Nominated motor revolution	Nominated motor revolution	1460RPM	0~3000
F207	Nominated motor tension	Nominated motor tension	380V	0~460
F208	Motor pole number	Motor pole number	4	2~128
F209	Motor slip frequency	Motor slip frequency	1.4Hz	0～10.00

No.	name	description	Factory setup	scope
F210	Type of encoder	Type of encode 0: ABZ Incremental encoder 1: Sin Cos absolute encoder (Synchronous motors) 2 En-dat absolut encoder (Synchnronous motors)	2	0~2
F211	Encoder impulse	Encoder impulseper turn	1024	500~16000
F212	P0-Factor	P-Factor encoder at Zero RPM	130.00	0.00~655.35
F213	I0-Faktor	I-Factor encoder at Zero RPM	80.00	0.00~655.35
F214	D0-Factor	D0Factor encoder at Zero RPM	0.50	0.00~655.35
F215	P1-Factor	P-Factor encoder at low RPM	130.00	0.00~655.35
F216	I1-Factor	I-Factor encoder at low RPM	80.00	0.00~655.35
F217	D1-Factor	D-Factor encoder at low RPM	0.50	0.00~655.35
F218	P2-Factor	P-Factor encoder at average RPM	130.00	0.00~655.35
F219	I2-Factor	I-Factor encoder at average RPM	80.00	0.00~655.35
F220	D2-Factor	D-Factor encoder at average RPM	0.50	0.00~655.35
F221	P3-Factor	P-Factor encoder at high RPM	130.00	0.00~655.35
F222	I3-Factor	I-Factor encoder at high RPM	80.00	0.00~655.35
F223	D3-Factor	D-Factor encoder at high RPM	0.50	0.00~655.35
F224	Freq. 0		1.0%	0~100%
F225	Freq. 1		50.0%	0~100%
F226	V0-Stoptime		0.5s	0.0~30.00
F227	Delay brake monitor	Delay time for brake mon switch 0: no brake monitoring	0.25s	0.0~30.00
F228	Output current		0.00s	0.0~10.00
F229	Direction of rotation	0: positive direction 1: negative direction	0	0/1
F230	Torque compensation		100.00%	0.0~200.0
F231	Torque bias		0.0%	0.0~100.0
F232	Ecoder filter time		0ms	1~30
F233	Encoder direction	Direction of rotation from encoder always at 1 if motor doesn't turn change phase of motor!	1	0/1
F234	Motorphase	Adaption of direction of rotation motor, if it doesn't match with UP/DOWN cabin	1	0/1
F235	Empty load current value	Empty load current value	32.00%	0.00~60.00
F236	Pace freq.	Frequency of output current	6.000kHz	1.100~11.000
F237	Modul. bandwidth	Modulation bandwidth don't change!!	0kHz	0.0~1.0
F238	Regulator Mode	Regel. Mode don't change without reason	1	0~3
F239	Torque.Lmt	Torque limit, don't change without reason	175,00%	0~200
F240	Input tension FU	Input tension of inverter	380V	0~460
F241	Nominal powerFU	Nominal power of inverter	x kW	-

No.	name	description	Factory setup	scope
F242	Offset Phasangle	Offset Phaseangle of encoder. If on 0.0 for the next run a tuning is enforced. If a value of 0 is provided, set 0, 1!	0.0°	0.0~360.0
F243	Corr.phase angle	Correction of zeroangle at encoder 2. Activates correction	0	0/2
F244	free			
F245	Selection of F246-255 Parameter Function	Selection of Parameter F246-F255:Parameter F246-F255 could have different meanings dependant setting ofF245!	0	0~65535
F245=0 >> F246 to F255 as foolows				
F246	Overheating protection time for radiator	Tolerance time for exceeding then max cooling temperature	50 x0.01s	0~65535
F247	Overspeed protection coefficient	Tolerance value for exceeding nominal rotation speed (120%)	12000 x0.01%	0~65535
F248	Overspeed protection time	Tolerance for duration exceeding nominal rotation speed.	100 x0.01s	0~65535
F249	Confirmation times for inputting open phase	Tolerance for case of missing phase on input	35 mal	0~65535
F250	Confirmation times of short circuit of braking resistor	Tolerance for cases of short-circuit at brake resistance	10 mal	0~65535
F251	Confirmation times for SinCos encoder disconnection	Tolerance for ruption of sin cos signal at encoder	2 mal	0~65535
F252	Confirmation times of outputting open phase	Tolerance for open phase at output inverter	2000 x0.001s	0~65535
F253	Confirmation of voltage for charging relay feailure	errorr 144: charging relay feailure	65 Volt	0~65535
F254	Confirmation threshold of encoder phase CD failure	error 28: Phase presentation more than designated value	300	0~65535
F255	Protection threshold of ABZ encoder disconnection	Deviation of speed rotation above limit	20	0~100
F245=1 >> F246 to F255 as follows:				
F246	Protection times of IGBT	Tolerance value occurrence excess current IGBT	2	0~65535

No.	name	description	Factory setup	scope
F247	Protection option of I²t	Overload prot via I²t Function: 0: both variations 1: Variation1 2: Variation2	0	0/1/2
F245=2 >> F246 bis F255 haben folgende Bedeutung:				
F246	free	Internal use -do not change!		
F247	PWM Modulation mode	PWM Modulation	2	0~2
F248	free	Internal use -do not change!		
F249	free	internal use -do not change!		
F250	Three phase current balance coefficient	Only for your Info		
F251	free	Internal use -do not change!		
F252	Positive/Negative rotation enable	enables right/ left rotation: 0: Both directions 1 only right direction	0	
F253	Positiv/Negative rotation dead time	Dead time for changing sense of rotation	20 x0.1s	20~60000
F254	Acceleration overcurrrent threshold of inverter	The acceleration is limited if current exceeds the current limit	180,00%	0~200
F255	Decelerating overvoltage threshold of inverter	The deceleration is limited if tension in intermediate circuit exceed limit	750V	0~800
F245=3 >> F246 to F255 as follows:				
F246	Current Loop P	Current controller P-Factor, do not change!	140	35~280
F247	Current Loop I	Current controller I-Faktor, do not change!	100	25~200
F248	Current Loop D	Current controllerD-Faktor, do not change!	0	0~200
F254	Torque Direction	Torque Direction 0: pos; 1: neg	0	0/1
F245=4 >> F246 bis F255 as follows:				
F246	Software Version	Only read		
F247	ID No 0	Only read		
F248	ID No 1	Only read		
F249	ID No 2	Only read		

No.	name	description	Factory setup	scope
F250	ID No 3	Only read		
F251	ID No 4	Only read		
F252	ID No 5	Only read		
F253	Inverter rated current	Rated current inverter	x0.1A	Only read
F254	Rated current of current sensor	Rated current of current sensor	A	Only read
F255	Motor power coefficient	Max. rated output Power	200,00%	50~400%
F245=5 >> F246 bis F255 as follows:				
F246	Stator Resistor	Stator resistance Asynchronous-motor	x0.001R	
F247	Rotor Resistor	Rotor resistance Asynchronous-Motor	x0.001R	
F248	Stator Inductor	Stator Induktivitiy Asynchronous-Motor	x0.0001H	
F249	Rotor Inductor	Rotor Induktivitiy Asynchronous-Motor	x0.0001H	
F250	Mutual Inductor		x0.0001H	
F251	Motor low speed overcurrent threshold	Over-current limit for RPM below 20% of rated RPM	x0.1%	
F252	Low speed overcurrent time	Duration of Over-current for low RPM	x0.1s	
F253	Motor high speed overcurrent threshold	Over-current limit for RPM above 20% of rated RPM	x0.1%	
F254	High speed overcurrent time	Duration of over-current for high RPM	x0.1s	
F255	Frequency dividing coefficient of encoder	Divisor for encoder.Requires convinient board for encoder with divisor	0	0~7
F245=6 >> F246 bis F255 as follows:				
F246	Synchronous motor study angle when power on	Auto measurement of phase -angle after return of synchronous motor. 0: deactivated 1: activated Sshould be turned OFF, if phase-angel is known and set	1	0~1
F247	Current gain when self study	Strenght of measurement current for phase -angle. Has to be adopted for some montors. The less is better as to much.	150,00%	0~400
F248	Command option	Option for run command	2	0~2
F249	Zero servo process current loop gain	Hold-up current-normaly is not to change!	100,00%	48~65535

15.Error code

Code	display	error	Remarks
00			
01		Preset maintenance interval expired	Levelling not correct and inspection run not possible when maintenance period is invalid.
02	Door lock OFF		
03	UP limit Sw. OFF	Uppermost end switch reached	
04	Dn limit Sw. OFF	Lowermost end switch reached	
05	Can't open door	Door could not be opened.	8 trials failed in normal mode.
06	Can't close door!Tuer Zu Fehler	Door could not be closed.	8 trials to close fails in normal mode
	free		
08	CANbus Err	CAN-bus connection to car controller panel disturbed	No connection to car controller panel or final resistance not active.
09	Inverter Err	Error on inverter	Input X11 depicts error at inverter
10	Up Sw. 1 Err	End switch up 1 defectous	
11	Down Sw. 1 Err	End switch 1 down defectous	
12	Up Sw. 2 Err	End switch up 2 defectous	
13	Down Sw. 2 Err	End switch2 down defectous	
14	Up Sw. 3 Err	End switch up 3 defectous	
15	Down Sw. 3 Err	End switch 3 down defectous	
16	Up Sw. 4 Err	End switch up 4 defectous	
17	Down Sw. 4 Err	End switch 4 down defectous	
18	free		
19	Door limit Err		
20	Sliding Protect	Sliding protect has triggered	Elevator takes longer then presetted time in F62 without changing levelling signals
21	Motoroverheat	Motor is overheated	PTC Input longer than 2 sec.⟶ active!.
22	Enc. Wrong Dir.	Real direction of rotation isn't the same with the controlled one	Encoder signal in wrong direction in normal modem with more than 0,15m/s.
23	Enc. Overspeed	Elevator runs to fast	Multistep mode: after 1,5sek delay the speed is still over 0,2m/s. Analogue Mode: rated-speed is 25% über target-speed. Real speed is 8% higher than nomninal speed. Landing speed is over limit landing speed.
24	Enc. Lowspeed	Elevator runs to slow	Multistep: after 3s still below 50mm/s. Analogue-Mode: elevator slower than 50% of

Code	display	error	Remarks
			targeted speed.
25	free		
26	free		
27	Up level Sw. Err	Sensor up levelling defectous	
28	Dn level Sw. Err	Sensor down levelling defectous	
29	free		
30	Leveling Err	actual value of leveling signal is bigger +/- than 180mm .	Position of levelling magnet is bigger than +/- 180mm . → new learning movement necessary!
31	free		
32	Safe loop broken	Safety loop is not closed	
33	free		
34	KMC Protection	K1 monitoring reports error	Output Y2 doesn't correspond with Input X8
35	KMC Protection	K8 monitoring reports error	Output Y2 doesn't correspond with Input X9.
36	KMC Protection	K2 monitoring reports error	Output Y2 doesn't correspond with Input X8.
37	Dr. Lock Error	Only relevant for asia	
38	Brake Sw. Err	Brake switch monitoring reports error	Brake contactor active, but brake is not activated brakes don't work synchronous (X22,X23).
39	Safety Relay Err	Security loop is controlled addionally on Input X13 via relay. X13 and high voltage inputs differ. (note Parameter F156)Only relevant for Asia	Safety Circuit input signal differ from safety circuit relay detection signal X13. (look Parameter F156). Only for Asia
40	Inv Enable Err	Inverter enable monitor detects error	Signal for depr brake there-**no** inverter run signal!.
41	free		
42	Slow'down Sw. Err	Number of installed correction switches does not correspond with set parameters.	
43	Limit test err.		
44	free		
45	Relvl Relay err		
46	free		
47	free		
48	free		
49	Invert comm. Err	Communication error between inverter and car top panel	
50	Parametererror	parameter read error	

Code	display	error	Remarks
51	free		
52	free		
53	free		
54	Dr. Lock Differ		
55	free		
56	free		
57	free		
58	free		
59	free		
60	Base Block Err		
61	0 Spd Servo err		
62	No speed.		
63	free		
64	free		
65	free		
66	free		
67	RTC ERR		
68	Level Device Err	Lenght of leveling/ doorzone is shorter than distance tor floor stop.	
69	Palte Num Err	Number of leveling/ doorzones doesn't match with number of stops.	
70	free		
71	OC Protection	Overcurrent protection	
72	ADC Error	Current sensor error	Replace current sensor or mainboard
73	Radiator overheat		
74	BK unit 'Err.	Error in brake resistance	Check connection between inverter and brake resistor
75	DC Fuse break		
76	Over output torque		
77	Speed deviation		
78	DC Line OV.	Overtension DC	
79	DC Line LV	DC low tension	
80	Oput phase lose	Output phase missing	
81	Motor L-speed OC	Overcurrent Motor SLOW speed	
82	Encoder error		
83	Curr. After stop		
84	Speed reverse		

Code	display	error	Remarks
85	Slide after stop		
86	Motorphase Err.		
87	Fwd.Overspeed		
88	Rev..Overspeed		
89	UVW Enc. Err.		
90	Enc. Comm. Err.		
91	Abc OC	ABC overcurrent	
92	Brake protection		
93	Input Overpower	Input tension too high	
94	UVW Enc. Err		
95	Fan error		
96	No encoder Teach.		
97	Output OC		
98	SINCOS enc. Err		
99	Input phase lose		
100	Overspeed Protct		
101	Motor H-speed OC		
102	Ground Protection		
103	Kcapacitance Agin		
104	Outside Error		
105	Output Imbalance		
106	Para Setup Err	Parameter error	Adopt parameters of inverter.
107	Sensor error.		
108	BK resist short	Short circuit at Brake resistance	Check connection to brake resistor
109	Instantaneous OC		
110	free		
111	free		
112	free		
113	Inv.No comm.		

16.Displaycodes

Code	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**12**	**13**	**14**
Disp.	0	1	2	3	4	5	6	7	8	9	10	11	12	12	13	14
Code	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Disp.	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Code	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**
Disp.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
Code	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**
Disp.	47	48	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	EA	B1	B2	B3
Code	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**
Disp.	B4	B5	B6	B7	B8	B9	B	G	M	M1	M2	M3	P	P1	P2	P3
Code	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**
Disp.	R	R1	R2	R3	L	H	H1	H2	H3	3A	12A	12B	13A	17A	17B	5A
Code	**95**	**96**	**97**	**98**	**99**	**100**	**101**	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**
Disp.	G1	G2	G3	F	(*1)	C1	C2	C3	C4	C	D1	D2	D3	D4	D	1F
Code	**111**	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**	**121**	**122**	**123**	**124**	**125**	**126**
Disp.	2F	3F	4F	5F	1C	2C	3C	4C	49	1B	2B	3B	4B	1A	2A	4A
Code	**127**	**128**	**129**	**130**	**131**	**132**	**133**	**134**	**135**	**136**	**137**	**138**	**139**	**140**	**141**	**142**
Disp.	CF	LB	E	A	UB	LG	UG	6A	6B	7A	7B	5B	6C	DG	T	OG
Code	**143**	**144**	**145**	**146**	**147**	**148**	**149**	**150**	**151**	**152**	**153**	**154**	**155**	**156**	**157**	**158**
Disp.	SB	15A	13B	K	U	S	EG	KG	KE1	KE2	KE3	KE4	KE5	KE6	KE7	KE8
Code	**159**	**160**	**161**	**162**	**163**	**164**	**165**	**166**	**167**	**168**	**169**	**170**	**171**	**172**	**173**	**174**
Disp.	KE9	GF	MZ	SR	19A	Z	HP	AB	PH	AA	L1	L2	L3	PB	-10	AG
Code	**175**	**176**	**177**	**178**	**179**	**180**	**181**	**182**	**183**	**184**	**185**	**186**	**187**	**188**	**189**	**190**
Disp.	BE	RF	1L	5L	1M	3M	4M	B1A	B2A	B3A	B4A	PM	14A	14B	AS	15B
Code	**191**	**192**	**193**	**194**	**195**	**196**	**197**	**198**	**199**	**200**	**201**	**202**	**203**	**204**	**205**	**206**
Disp.	16A	16B	22A	22B	E1	E2	S1	S2	S3	E3	E4	49	50	51	52	53
Code	**207**	**208**	**209**	**210**	**211**	**212**	**213**	**214**	**215**	**216**	**217**	**218**	**219**	**220**	**221**	**222**
Disp.	54	55	56	57	58	59	60	61	62	63	64	P4	P5	KE	EM	3D
Code	**223**	**224**	**225**	**226**	**227**	**228**	**229**	**230**	**231**	**232**	**233**	**234**	**235**	**236**	**237**	**238**
Disp.	P6	U1	U2	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)
Code	**239**	**240**	**241**	**242**	**243**	**244**	**245**	**246**	**247**	**248**	**249**	**250**	**251**	**252**	**253**	**254**
Disp.	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)	(*1)
Code	**255**	**256**														
Disp.	(*1)	(*1)														

(*1) Nicht vordefiniert, können für Sonderfälle verwendet werden

17.Parameters Motor types

	Torin			Sassi		Swiss-Traction	
	630-675 kg		520 kg	1000-1050 kg		1050 kg	450 kg
	0,63 m/s	1,00 m/s	0,63 m/s	0,63 m/s	1,00 m/s	0,63 m/s	1,00 m/s
F212	80	70	70	100	100	140	80
F213	50	30	35	40	60	70	50
F214	0,1	0,1	0,1	0,1	0,1	0,1	0,1
F215	35	40	35	20	40	40	40
F216	10	30	10	5	5	15	5
F217	0,1	0,1	0,1	0,1	0,14	0,1	0,14
F218	35	35	35	20	60	60	40
F219	10	25	10	5	23	40	15
F220	0,1	0,1	0,1	0,1	0,18	0,1	0,18
F221	40	40	40	20	60	50	40
F222	15	15	15	5	4	5	7
F223	0,1	0,1	0,1	0,08	0,08	0,1	0,08
F224	1,0%	1,0%	1,0%	0,8%	0,8%	0,8%	0,8%
F225	50%	50%	50%	50%	50%	50%	50%
F226	0,8s	0,8s	0,8s	1,5s	1,5s	1,5s	1,0s
F227	0,2s	0,2s	0,2s	0,2s	0,17s	0,17s	0,25s
F228	0,2s	0,2s	0,2s	0,2s	0,2s	0,3s	0,2s
F12	0,2	0,2	0,2	0,2	0,2	0,2	0,2
F13	0,02	0,02	0,02	0,02	0,02	0,02	0,02
F24	1	1	1	1	1	1	1
F16	0,2s	0,2s	0,2s	0,2s	0,2s	0,2s	0,2s
F245=3							
F246	140	140	40	140	140	140	140
F247	100	100	20	100	100	100	100
Bei Kurzhaltestellen: F0=0,6 m/s2, F1=0,6 m/s2							