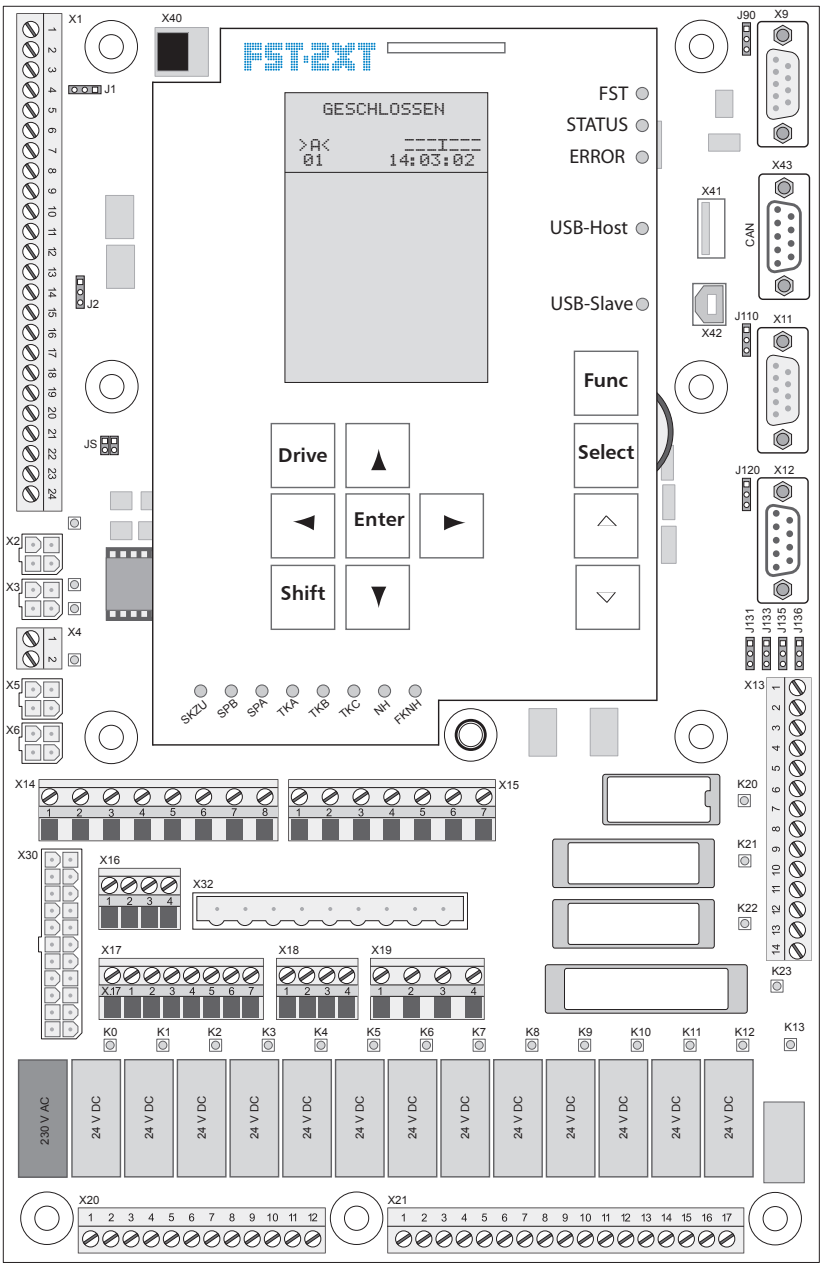
NEW LIFT

NEUE ELEKTRONISCHE WEGE

FST-2XT MRL

Lift controller for machine room-less installations

MANUAL



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Date of issue 03.07.2013

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Release 14.06.2013 AL

Hardware version

Software version

Doc. No. hb_fst2xtmrl_2013-07_en

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1 General

Control cabinet FST-2XT MRL is designed for machine room-less lifts and is available with a wide variety of drive packages. The lockable control cabinet is usually located close to the entrance of one of the shaft access areas, preferably near the drive located in the shaft. The integrated LIFT Guard Panel contains all switching elements and components needed for the freeing of persons.

This manual provides further information only on the special features of control cabinet FST-2XT MRL. Further information on the FST-2XT controller can be found in the FST-2XT Manual and the FST-2XT Installation & Commissioning Manual.

This document only describes the assemblies of the system delivered by *NEW* LIFT.

For information on components of control cabinet FST-2XT MRL that were not manufactured and supplied by *NEW* LIFT, please refer to the respective user information supplied by the manufacturer or supplier.

1.1 Abbreviations, characters and symbols used

✶ **Delivery condition**
Settings that are supplied as standard are marked with an asterisk ✶.

⛔ **System stop**
Marks settings requiring a system stop in case a change becomes necessary. The FST-2XT controller displays the text `Um Wert zu aendern muss Aufzug gestoppt werden. OK?` If you wish to change the value, confirm with `YES`, if you do not wish to change the value or wish to change it later, then confirm with `NO`.

○ **Re-start**
Marks settings that only become active after a re-start of the FST-2XT or of the components.

► **Activity symbol**:
Activities described after this symbol must be carried out in the given order.

+ Key combination:
Press the linked keys simultaneously.

Abbreviations for technical details concerning terminals
P Power
I Input
O Output
L Low active
H High active

⚠ ***Safety-relevant information***

This symbol is located in front of safety-relevant information.

ⓘ ***Information notice***

This symbol is located in front of relevant information.

1.2 Further information

The following documents, among others, are available for the FST-2XT controller and its components:

› FST-2XT Installation & Commissioning
› FST-2XT manual
› ADM manual
› FPM manual
› SAM manual
› Fire recall manual
› UCM-A3 manual

These and other up to date manuals can be found in the download area of our website unter Service
http://www.newlift.de/service/download

1.3 How to contact us

If, after referring to this manual, you still require assistance, our service line is there for you:

Tel +49 89 – 898 66 – 110
E-mail service@newlift.de

Mon. - Thurs.: 8:00 a.m. – 12:00 p.m. and 1:00 p.m. – 5:00 p.m.
Fr: 8:00 a.m. – 3:00 p.m.

1.4 General safety regulations

The FST-2XT MRL control cabinet must only be operated in perfect working condition in a proper manner, safely and in compliance with the instructions, the valid accident prevention regulations and the guidelines of the local power company.

This manual is a supplement to the FST-2XT manual and the FST-2XT Installation and Commissioning manual whose safety guidelines must always be observed.

1.4.1 Applicable standards and guidelines

The FST-2XT MRL fulfils:

› the safety guidelines for the construction and installation of passenger and goods passenger lifts (DIN EN 81 Part 1 and 2).
› the conditions for the erection of high voltage installations with nominal voltages up to 1 kV (DIN VDE 0100).
› the contact protection measures in the machine room (VDE 0106).
› the data sheet on safety measures for the installation, maintenance and commissioning of lift systems (ZH 1/312).

1.4.2 Electromagnetic compatibility (EMC)

An accredited inspection authority has inspected the FST-2XT control system and its components in accordance with the standards, thresholds and severity levels named in EN12015/1995 and EN12016/1995.

The FST-2XT control system and its components are:

› immune to electrostatic discharge (EN 61000-4-2/1995)
› immune to electrostatic fields (EN 61000-4-3/1997)
› immune to fast transient disturbances (EN 61000-4-4/1995)

The electromagnetic disturbance field strengths created by the FST-2XT control system and its components do not exceed the permissible thresholds. (EN 55011/1997).

1.4.3 Handling electronic assemblies

› Keep the electronic assembly in its original packaging until installation.
› Before opening the original packaging, a static discharge must be performed. To do this, touch a grounded piece of metal.
› During work on electronic assemblies, periodically perform this discharge procedure.
› All bus inputs and outputs not in use must be equipped with a terminal resistor (terminator).

2 FST-2XT MRL

The machine room-less design of the controller and drive concept results in the following special features:

Control cabinet

› The control cabinet is designed as a lockable control cabinet for assembly in the entrance of one of the shaft access areas, preferably near the drive located in the shaft
› The width of 400 mm makes it possible to install it in the entrance recess in the sliding doors to the right or left of the door
› Can also be delivered as a fire-proof variant as an option (F30/I30, without functional integrity, see appendix A)
› Area for lift attendants and area for authorised specialists, protected by lockable Plexiglas cover
› Activation and operation of the frequency inverter is done from the control cabinet via the DCP serial protocol. For this reason, the frequency inverter does not have an operation unit.
› In order to optimise the drive curve, the frequency inverter can be also be operated and configured from the car using the HHT hand-held terminal.

LIFT Guard Panel

› Integrated emergency status monitor
› Main switch
› Auxiliary control
› Fuses

Emergency status monitor

› Replaces the optical monitoring of the drives during the return drive (EN81-1 14.2.1.4) or freeing of persons
› Connected to LON bus of the FST-2XT controller and displays drive speed, car position, levelness and direction of travel (even in the event of a power failure)
› No additional devices such as a video camera or viewing window are necessary

2.1 Technical data

Description	Value
Supply voltage	400 V AC / 230 V AC ±10% 50 - 60 Hz
Outputs	Short circuit-proof
Protection type	IP52
Colour	RAL 7035
Height x width x depth, Standard IP52 RAL7032	2000 x 400 x 200 mm
Base height	100 mm or 200 mm
Height x width x depth, F30 IP52 RAL7032	2204 x 517 x 282 mm
Base height	100 mm, pre-assembled
Temperature range: Storage & transport / operation	-20 – +70 °C / ±0 – +60 °C
Relative humidity: Storage & transport / operation (non-condensing)	+5 – +95 % / +15 – +85 %

Other control cabinet colours as well as stainless steel variants available for the control cabinet on request.

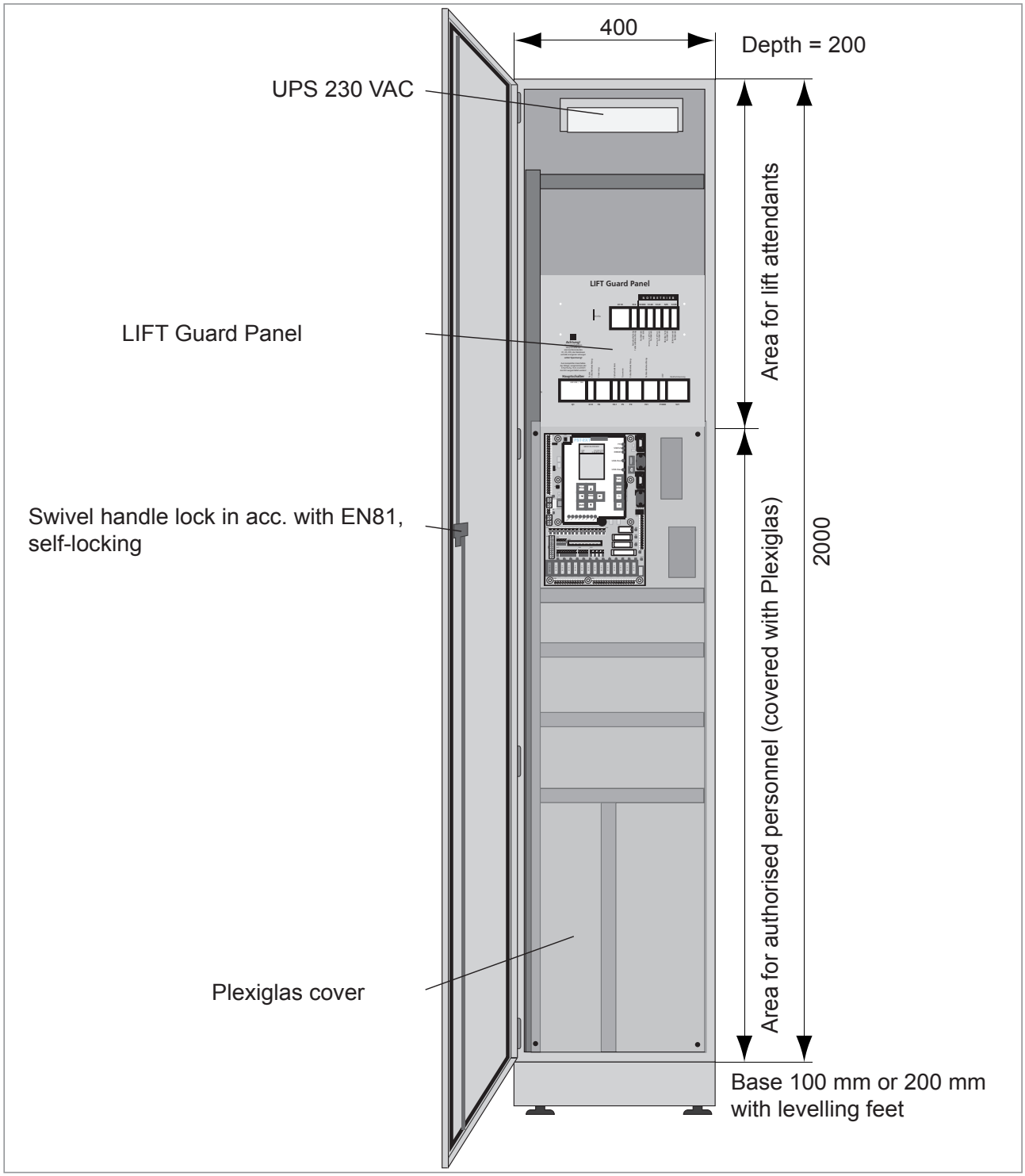

Fig. 2.1: Illustration of control cabinet FST-2XL MRL

2.2 LIFT Guard Panel

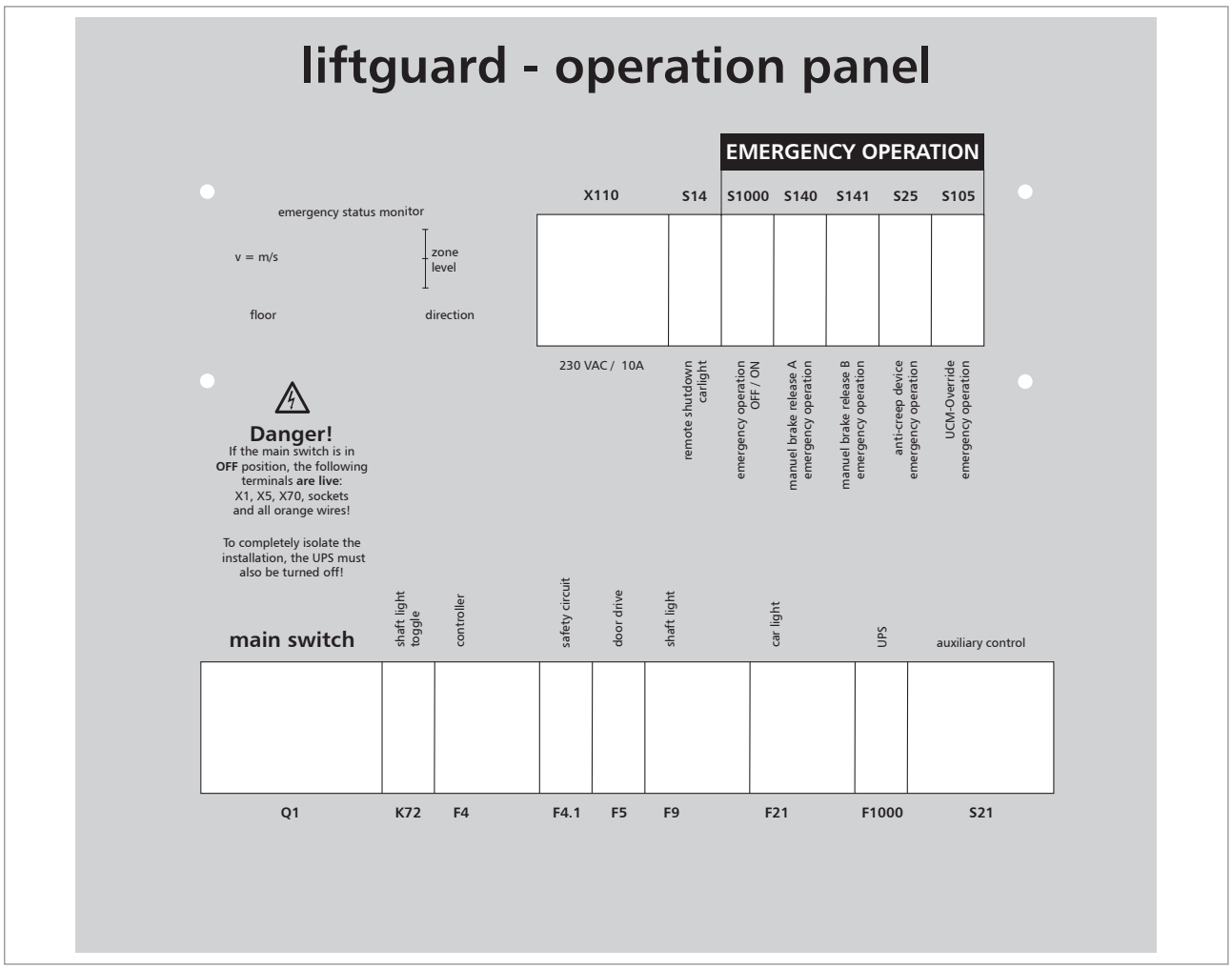

Fig. 2.2: Operating elements of the LIFT Guard Panel

2.2.1 Emergency status monitor

The emergency status monitor replaces the optical monitoring of the drives during the return drive (EN81-1 14.2.1.4) or freeing of persons. It is connected to the LON bus of the FST controller and displays the following information (even in the event of a power failure):

› Drive speed in m/s.
› Floor position of the car
› Levelness of the car
› Direction of travel of the drive

2.2.2 Socket 230 V AC / 10 A

The operating device socket makes it possible to connect 230VAC devices for assembly or maintenance purposes. The socket is located in the shaft light circuit and is protected by the RCBO (combined residual current device (RCD) with circuit breaker) of shaft light F9 (B 10A).

When the shaft light is switched on,the maximum possible current load of the socket is reduced by the respective power consumption of the shaft light. Only when the shaft light is switched off are 10A available on the socket. If the power consumption is higher, fuse F9 trips.

2.2.3 Control switch and fuses

Main switch Q1

The main switch is used to switch the entire lift system (including the frequency inverter) on and off.

The UPS emergency power supply features its own internal power source (batteries). That is why the FST controller, emergency current monitor and brake control components can be live even if the main switch is switched off.

To switch off power to the entire installation, excluding the feed terminals and an optional UPS if necessary, control switch S1000 must be switched off in addition to the main switch.

Shaft light K72

Surge relay K72 is used to control the shaft light via shaft light button S72 (on the car and in the shaft pit).

Switching the shaft light from the control unit is done by actuating the control button directly on relay K72.

Car light S14

Control switch S14 is used to switch off the car light and shut down the installation.

After control switch S14 is switched off, shut down occurs as follows:

› FST display shows REMOTE SHUTDOWN
› Car is sent to a adjustable remote shutdown floor (setting under `HAUPTMENUE / Konfig / Fernabsch. Etage`)
› Car door opens for the set open hold time (setting under `HAUPTMENUE / Tueren / Tueren Selektiv / Offenhaltezeit`) and then closes
› Car lighting is switched off and the installation remains shut down until S14 is switched on again

S1000 UPS ON/OFF

Control switch S1000 is used to switch the emergency power supply on and off.

The UPS features its own internal power source (batteries). To prevent the batteries from discharging during normal operation, the following must be observed:

Only switch on emergency power supply via control switch S1000 when needed. Before leaving the installation, switch off the emergency power supply via control switch S1000 without fail.

Opening brake S140/S141

Control buttons S140/S141 are used to manually release brake circuits A and B of the drive. They can be used to implement the "freeing of persons", "checking the dual-circuit" and "checking the brake release monitoring system" functions.

More information can be found in chapter 3.1 "Freeing of persons", 3.2 "Checking the dual-circuit drive brake system" and 3.4 "Checking the brake release monitoring system".

F4 controller

The RCBO of controller F4 secures the entire safety circuit as well as power supply G1 for the FST circuit board with 6A by default.

F4.1 safety circuit

The wiring protection of the safety circuit is performed by circuit breaker F4.1 as well as the RCBO F4. This is 2A by default.

F5 door drive

The circuit breaker of door drive F5 secures the door drive with 6A by default.

F9 shaft light

The RCBO of shaft light F9 secures the shaft light with 10A by default.

F21 car lighting

The RCBO of car lighting F21 secures entire lighting circuit L4 with 10A by default.

Lighting circuit L4 supplies the following components:

› Car lighting
› Car ventilation
› Socket on the car roof
› Auxiliary power supply G2

F1000 UPS

Control fuse F1000 secures the UPS of the emergency power supply with 10A by default.

The internal batteries of the UPS can only be charged with control fuse F1000 switched on. Always leave control fuse F1000 switched on in normal operation.

Auxiliary control

The auxiliary mode control makes it possible to move the car with dead man control in accordance with EN81-1: 1998 / section 14.2.1.4. This enables car movement in the upward and downward directions.

During a drive with auxiliary mode control, the drive movements must be monitored using the emergency status monitor.

Switch positions

The following switch positions are recommended:

Switch / fuse	Normal operation	Auxiliary mode	Freeing of persons
Q1 main switch	ON	ON	OFF
K21 shaft light	OFF	-	-
S14 car light	ON	-	-
S1000 emergency current	OFF	OFF	ON
F4 controller	ON	ON	ON
F4.1 safety circuit	ON	ON	
F5 door drive	ON	ON	-
F9 shaft light	ON	-	-
F21 car light	ON	-	-
F1000 UPS	ON	ON	-

Note: Positions labelled with "-" are not relevant for these switch positions.

2.3 Frequency inverter remote control with FST-2XT keypad

The frequency inverter installed in the shaft can be controlled remotely using the keypad of the FST-2XT via the DCP 03 interface protocol.

The following frequency inverters are controlled as standard by *NEW* LIFT. You will find the settings for these in the course of this chapter.

› Fuji FRENIC Lift
› Ziehl-Abegg ZETADYN 3BF and ZETADYN 3CA/3CS
› Loher DYNAVERT L
› Liftequip MFC 20/21 and MFC 30/31
› CT Unidrive SP
› Brunner & Fecher FB-10, FBS-10, FB-11, FB-12

2.3.1 Basic settings of the FST-2XT

Please check the values pre-set by NEW LIFT ***before the first assembly drive*** *and change them if necessary. If the values are not correct, communication with the frequency inverter is not possible.*

2.3.2 Connection and operation with DCP 03

DCP 03 is a serial interface protocol which allows communication between the FST-2XT control and the frequency inverter.

Benefits of connection to DCP 03:

› Reduction of wiring effort
› Optimisation of data security
› Elimination of the operating device of the frequency inverter, as operation occurs via the FST-2XT controller
› Configuration of the frequency inverter via hand-held terminal HHT from any place on the LON bus as well as optional remote control via RDT.

Connection of the DCP cable

The DCP cable must be connected before the first assembly drive! If the DC cable is not connected, communication with the FST-2XT controller is not possible.

Ensure that the pre-sets of the frequency inverter are configured to the DCP03. If necessary, confer with the manufacturer of the frequency inverter.

The DCP cable has a connector on one side. It is to be plugged into the FST-2XT X12 according to the wiring diagram and connected to the frequency inverter (RS485).

Terminal assignment

Wire colour	Signal	Fuji	Ziehl-Abegg	Loher	Liftequip	CT	Brunner & Fecher	Pin FST-2 X12
br	DATA +	RS485.1	DA	7.4 (bridged)	90.2	3/5	2	4, 7
wh	DATA -	RS485.2	DB	8.9 (bridged)	90.1	2/4	3	8, 9
gr	GND	RS485.3	OVD	5	90.3	1	8	5
gr/yl	PE	RS485.4	Shield	/	/	Shield	/	Housing

Operation with DCP 03

Operation of the installation with DCP03 is very comfortable for the user. It makes setting and configuring the frequency inverter possible not only from the control cabinet, but also from the car with hand-held terminal HHT (FST-IRT).

In the event of errors during data transmission of the DCP interface, an S is displayed in the FST display in line D, column 1:

Display	Meaning
	Communication is running smoothly
S	No connection between FST-2 XT control and frequency inverter
s	Disrupted communication

Frequency inverter remote control with DCP 03

To start the operation of the frequency inverter, press the Drive button on the FST-2XT or go through HAUPT-MENUE / Antrieb / Antriebsmenü.

The display of the frequency inverter is simulated on the FST display and the FST-2XT buttons receive the following functions:

FST-2	Fuji	Ziehl-Abegg	Loher	Liftequip	Brunner & Fecher
▲	∧	↑	△	+	UP
▼	∨	↓	▽	-	DOWN
◀	RESET	esc	P		-
▶	PRG	esc	I	Cursor	QUIT
Enter	FUNC DATA	↵	↵	Parameter Value	ENTER
Shift	SHIFT »	Move cursor right	S	Save	-

To return to the FST-2 operating mode, press the Drive button on the FST-2 again or use key combination Shift + ◀ + ▶ on the FST.

2.4 UPS emergency power supply

The UPS emergency power supply is assembled in the area for lift attendants in the control cabinet and already electrically connected. It is connected via control switch S1000 and protected on the supply side via control fuse F1000 and on the output side via micro-fuse F1001.

In the event of a power failure, the UPS provides 230 V AC power to enable the controlled freeing of persons by the lift attendant.

The following components are supplied with emergency current:

› FST controller
› Emergency status monitor
› Brake rectifier V7 for manual brake release via control switches S140 and S141

The UPS features its own internal power source (batteries) which is why the components listed above can be live in the event of a power failure.

Only switch on the emergency power supply via control switch S1000 if necessary and switch off the emergency power supply via control switch S1000 without fail before leaving the installation.

First switch-on

Follow this procedure when switching on the UPS for the first time:

- ► Read the operating instructions of the UPS carefully
- ► Switch on control fuse F1000
- ► Switch off control switch S1000
- ► Switch the UPS on by pressing the "ON/OFF" switch directly on the UPS housing

The UPS acknowledges the switching-on procedure with a whistle tone and both LEDs on the front of the device light up for 2 seconds. The UPS is ready for operation when only the green LED is illuminated after the switching-on procedure.

The UPS is not ready for use if the whistle tone does not stop after a short period of time or the green LED does not illuminate.

Check control fuse F1000 or read chapters on rectifying faults in the operating instructions of the UPS if necessary.

First charging process

The batteries of the UPS must be charged for at least 24 hours after they are switched on for the first time.

Keep control switch S1000 switched off during the charging process so that no power is taken from the UPS.

Important information for storage and installation!

This package contains an UPS!
UPS – uninterruptible power supply utilising rechargeable batteries
To ensure proper function of the UPS please observe the following handling instructions!

Depending on storage temperature, the UPS **must be charged for at least 8 hrs** after being stored in a switched off condition for

more than 6 months at 25°C
more than 4 months at 30°C
more than 2 months at 40°C

Otherwise warranty claims will not be accepted!

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Maintenance of batteries

The UPS batteries are maintenance-free and are permanently monitored by the UPS electronics. A battery malfunction is displayed by the UPS via an acoustic signal (3 whistle tones every 2 seconds).

The batteries are to be changed by personnel with battery expertise and knowledge of the required precautionary measures. Keep unauthorised persons away from the batteries.

You can find more information in the operating instructions of the UPS.

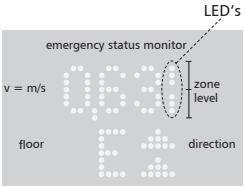
3 FST-2XT MRL in practice

3.1 Freeing of persons

The following steps may only be taken by trained lift attendants:

Evacuation instructions

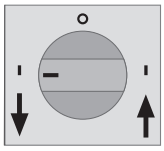
Freeing of persons may only be done by trained and authorised personnel!
Only evacuate the car in EMERGENCY SITUATIONS!
Only evacuate to the nearest floor!
NEVER bridge the safety circuit!



Step 1: Calm down affected persons
Calm down trapped persons by the car intercom (if present) or by acclamation and announce that they will be rescued. Request the trapped persons to hold a distance to the car door(s).

Step 2: Localise the car
With the help of the zone display, read whether the car is already in the door zone (±200 mm):
Within the door zone; illuminates three LED
› Read off car position on display (00 = bottom floor),
Set main switch **Q1** to **„0“** and go on with Step 5
Outside the door zone; does not illuminate
› Go on with Step 3

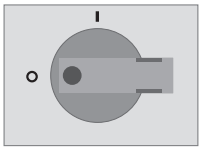
auxiliary control



S21

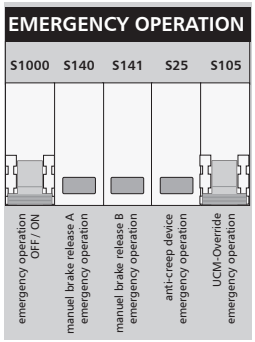
Step 3: Drive car into door zone with auxiliary control
Move car up/down with **S21** until zone display illuminates three LED (car movement is displayed by directional arrows)
Read off car position, Set main switch **Q1** to **„0“** and go on with Step 5
Car cannot be moved using auxiliary control:
› Set main switch **Q1** to **„0“** an go on with Step 4

main switch



Q1

Step 4: Move car into door zone with brake release button
Switch on evacuation switch **S1000**
Press the optional switches **S25** and / or **S105** if available.
Press brake release buttons **S140/S141** simultaneously and hold them down until the speed indicator illuminates „**v=m/s**“ 0,2.
Let the **S140/S141** go and do not press them again until the speed indicator extinguishes.
Repeat the process until zone display illuminates three LED, read off car position, Switch off **S1000** and optionally switch of **S25** and/or **S105**.



Step 5: Evacuate car
Go to the floor in which the car is located. Only open doors here! Unlock shaft doors with emergency key, Open shaft & car door.
Caution! Possible risk of tripping!
Free trapped persons.

Step 6: Completing evacuation
Close car and shaft doors and lock securely.
Check to see that all shaft doors are locked!
If locking is not possible:
Block access to the shaft.
Immediately notify the responsible lift company.

If the trapped persons cannot be rescued, the breakdown service must be notified!
Inform the responsible lift company when further operation is not possible.

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3.2 Checking the dual-circuit drive brake system

For the following activities, access to the control cabinet area for authorised personnel (persons who are able to identify and rectify all irregularities and faults that might occur during installation and operation of a lift system and who have sufficient knowledge of the relevant provisions - German accident prevention regulations (UVV), German occupational-insurance-association rules (BGV) section A2) is required. This must be done by two people.

► Remove Plexiglas cover from the area for authorised personnel.

► Switch the installation into normal operation and make sure that no persons are located in the car, lock the doors and switch the exterior controller OFF.

► Give the UP or DOWN call command

► Press button S143 during the drive and keep it pressed.

► At the same time, press one of the S140 or S141 buttons and keep it pressed; you may press S25 as an option (if it is actuated during the drive, an emergency stop is performed by the contacts of S140 and S141 located in the safety circuit, keeping S143 and S140 or S141 pressed keeps one of the two brake circuits released); see wiring diagram.

The car must stop with only one brake circuit.

► Repeat the process with the second brake release button

► Put the Plexiglas cover back on.

► If necessary, reset the DRM contactor monitoring error since button S143 is integrated in the contactor monitoring system for monitoring purposes.

3.3 Checking traction with counterweight applied

The procedure for checking traction is dependent on the type of shaft positioning system.

3.3.1 Procedure for incremental positioning

The following steps are taken to check the traction:

► Level the car in the top floor.

► Lock the exterior controller with the button.

The car door opens

► Switch on the auxiliary mode control when the car door is open.

► Fasten test aid on the car door frame (several self-adhesive strips are attached to the test aid)

► Move the car upwards using the auxiliary control.

Close shaft and car door, test aid is visible from the floor through the shaft door slot, car moves upwards

► Observe test aid and emergency status monitor during the drive

If the test aid comes to a stop after the permissible movement past a floor and the emergency status monitor displays a speed of v > 0 m/s, the traction check was successful, i.e. the empty car is not pulled to the ceiling and the bearer cables glide.

If the test aid moves upwards farther than the permissible movement past a floor and does not come to a stop, the traction is too high!

► Move the car downwards away from the upper emergency end switch using the auxiliary control and level it in the highest floor.

► Switch off auxiliary control

Car door open

► Remove test aid

► Give test command

► Enable the exterior controller with the button

The installation is once again operating normally

3.3.2 Procedure for absolute positioning

The following steps are taken to check the traction:

► Level the car in the top floor

► Switch on auxiliary mode control

► Call up the following display in the FST menu:
MAIN MENU -> Drive-> Controller menu -> ACTUAL speed parameter
Since the menu trees are dependent on the manufacturers of the frequency inverters and they are therefore different, these parameters can be found in the documentation of the frequency inverter.

The FST display shows the current drive speed.

The emergency status monitor shows the current car speed.

► Move the car using the auxiliary control. Observe both the FST display and the emergency status monitor.

If the car comes to a standstill after a short time when the drive is rotating (the car speed on the emergency status monitor is 0 m\s and the drive speed on the FST display is greater than 0 min-1), the traction test was successful.

If the car does not come to a standstill after a short time (the car speed on the emergency status monitor is greater than 0 m\s), the traction is too high!

► Move the car downwards away from the upper emergency end switch using the auxiliary control.

► Switch off auxiliary control

► Give test command

The installation is once again operating normally

3.4 Checking the brake release monitoring system

The brake release contacts are monitored during a standstill, when starting up and during a drive. A brake malfunction leads to error messages in the frequency inverter and in the FST-2XT which cause the installation to shut down:

The error messages are transmitted to the FST controller via the DCP03 and lead to the "DRM brake error" message. They are stored in the error list of the FST controller along with the time and date.

Procedure for checks as well as for UCM-A3 execution for the "UCM-A3 drive error":

Resetting is done via the "Error reset" test menu; select UCM-A3 error reset for the UCM-A3 drive error.

Note:

Switching the controller power supply on/off does not reset the UCM-A3 drive error; this is only possible with the UCM-A3 error reset!
Further information on commissioning as well as checking the UCM-A3 function can be found in the UCM-A3 Manual.

The following steps are taken to check the brake release monitoring system by disconnecting one of the two brake magnets:

Note:

For the following activities, access to the control cabinet area for authorised personnel is required.

The following activities may only be performed by authorised personnel who:

› Are able to identify and rectify all irregularities and faults that might occur during installation and operation of a lift system,

› Have sufficient knowledge of the relevant provisions (German accident prevention regulations (UVV), Germany directives and statutes of trade associations (VGB))

Note:

Laws, regulations, guidelines and standards that apply in the country of operation must be followed in addition to the safety regulations mentioned in this manual.

► Remove Plexiglas cover from the area for authorised personnel.

► Switch on auxiliary mode control.

► Disconnect supply to brake release monitoring contact A, see wiring diagram.

This causes a response only from brake circuit B during start-up.

► Switch off auxiliary control and give command.

► For the test, simultaneously actuate brake buttons S143, S140 and S25 if necessary (optional) for approx. 3 seconds.

► The DRM brake monitoring error message appears in the display during "emergency stop" actuation after both buttons have been released.

► Reset this error under service error reset.

The FST detects that a brake circuit is not de-energised in standstill and shuts down the installation.

The FST controller outputs the "`DRM brake error`" message immediately after start-up.

The drive is cancelled.

► Execute the test in the same way with brake release button S141 for brake circuit B.

For more tests for putting the lift system into operation, please read chapters 6.6.2 and 6.7.4 in the Installation and Commissioning Manual.

NEW *LIFT*

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