Installation instructions

Hold-open system

For non – VdS fire doors

Version: 51171560

ISO 9001:2008
Zertifikat: 01 100 5118

-en-

Stand: c / 12.2015

0000000 0000 51171560 XXXXX

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Contents

Basic instructions

The fire door arrest system is designed for use in fire barriers. The design of the doors meets the Deutschen Institut für Bautechnik's requirements for hold open fire door systems.
Only qualified electrical technicians should work on electrical equipment. These personnel must assess the work assigned to them, identify potential hazards, and adopt appropriate safety measures.
Modification or alteration of the control system is only permitted after consultation with the manufacturer. Only original replacement parts and components approved by the manufacturer should be used to promote safety. Use of other parts will void liability.
The safety of the control system is guaranteed only when used as intended. Values provided in the technical specifications must not be exceeded under any circumstances (see corresponding sections of the manual).

Safety Regulations

Safety and accident prevention regulations for every specific contingency must be observed during installation, start-up, maintenance and testing.
The following precautions should be strictly followed. This is not an exhaustive list.

European regulation

- DIN EN 54	Automated fire detection and fire alarm system components - 5: Heat detectors, point detectors with static element threshold - 7: Smoke detectors - Point detectors using scattered light, transmitted light or ionisation - 8: Heat detectors with high temperature thresholds
- DIN EN 60950	Information technology equipment safety
- DIN EN 60742	
- EN 50081-1/1992	EN 55022, EN 55011, EN 61000-3 -2/ -3
- EN 50082-2/1997	EN 61000-4 -2/ -3 / -4/ -5/ -6/ -11, ENV 50204
- DIN ISO 10823	Guidance on the selection of roller chain drives

The following norms and standards must also be observed.

Regulations of the Association for Electrical, Electronic & Information Technologies (VDE)
"Richtlinien für Feststellanlagen" (Guidelines for Hold-Open Systems), Deutschen Institut für Bautechnik, Berlin (October 1988 edition)

- DIN VDE 0833	Fire, intrusion and hold-up alarm systems - 1: General provisions - 2: Requirements for fire alarm systems
- DIN 14675	Fire alarm systems - Construction

Fire prevention measures

Explanation of warnings

These operating instructions provide information which is important for the proper and safe use of the door controls and ELEKTROMATEN.

The individual warnings have the following meanings:

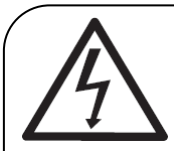
DANGER
This means that there is risk to the life and/or health of the user if proper precautions are not adopted.

WARNING
This indicates possible damage to the control system, the ELEKTROMATEN, or other elements, if proper precautions are not taken.

General danger warnings and safety precautions

The following safety precautions are intended as general guidelines for the use of the control system and ELEKTROMATEN with other equipment. These precautions must be strictly observed during installation and operation.

Before the control system is put into operation and position switches are adjusted, ensure that all screws have been properly tightened.



- Specific regulations applicable to safety and accident prevention must be observed.
- The ELEKTROMAT must be installed with proper safety covers and guards. Carefully check that seals are in good condition and that fittings have been properly tightened.
- ELEKTROMATEN in which the control system is permanently connected to the power main must have an all-pole mains switch with appropriate pre-fuse.
- Carefully check the power cables and lines regularly for breakage and to ensure the insulation is in good condition. If a fault is discovered in the cables, the power must be disconnected immediately, and the faulty cable must be replaced.
- Before putting the unit into operation, check that the power supply rating of the device matches that of the local electrical mains voltage.
- Three-phase connections must have clockwise rotation.

1 General Description

ELEKTROMATEN fire protection systems are designed for use with electrically operated fire doors which close in case of fire using gravity, ensuring that the fire barrier functions properly even in the event of power failure. Uninterrupted power is ensured by two (7Ah 2x12V) NP7-12 emergency batteries. Battery specifications meet minimum requirements for hours of operation for the maintenance of security devices, fire detectors and hold-open systems in the event of power failure. The power supply operates in buffer mode. Battery voltage is monitored continuously. After prolonged power failure, the door is slowly closed, and the battery circuit is opened. This stops the batteries from fully discharging.

Batteries must be replaced every 5 years.

OPTIONS:

1.1 3x400V power supply without neutral (N)

The 230V control voltage is generated by a T1, 400/230V control transformer. Required components must be ordered separately.

1.2 Safety strip with 8.2 k resistance rating

The A3 control unit must be installed and connected. The K3 switch is redundant and can be removed.

2 Safety system

2.1 Safety strip

- During operation, the contact of the safety edge is closed.
- The safety edge works during engine operation (only downwards) and fire alarms. In both cases, the door is stopped.
- In the event that the safety edge is defective, the door cannot be closed during engine operation.
- The S5 limit switch turns off the safety strip in the lower section (5 cm).

Warning!
When a fire alarm is activated, the door closes even if the safety edge is defective (physical protection).

2.2 Safety chain

The safety chain is comprised of:
- Emergency limit switch ON
- Emergency limit switch OFF
- Thermal contact in the motor coil or motor protection switch
- Stop button (control devices)
  If one of the contacts is open, the motor cannot be engaged.
  If an element in the safety chain is open, the I2 PLC input is de-energised. The display will indicate "Safety circuit interrupted."

2.3 Siren / optical warning

- In the event of fire the door will close and an active optical / audible alarm is activated.
- Max. power consumption 1A.

2.4 Fire alarm / smoke switch

- Fire alarm / smoke switch should only be used with voltage-free contacts.
- All contacts are connected in series, forming a closed circuit.
- A break in the circuit constitutes a fire alarm.

3 Motor operation (power available)

The following operating modes can be configured:

3.1 Dead man's in both directions – parameter **C2 = 1**

3.2 Dead man's OFF, Self-latching ON - parameter **C2 = 2**

3.3 Pulse operation (self-latching) in both directions upon reopening. The C-bridge must be inserted.

- Closing movement is only possible with intact safety strip.
- ON motion only when the control system is ready for operation.
- Readiness is signaled by the indicator light in the cabinet door. If this is not the case, press the S8 START button.
- The controller requires external assessment of the safety strip.
- The ON - movement has priority.
- When the safety edge is engaged in CLOSE movement mode (pulsed mode), the door reverses after a brief delay. The delay must be set (PLC parameter **T1**) so that permissible closing forces will be maintained in accordance with applicable regulation.

Warning!
The control system is delivered in dead man's mode. The C-bridge may be employed only when all settings are completed.

4 Operation of fire protection system

The door system is monitored by smoke detectors or fire alarms. If the smoke switch/fire circuit is closed +24V is applied to the PLC's I1 input.

4.1 Notification of fire via fire or smoke switch

- If the smoke detector switch is activated when a door is open, current brake Y1 is de-energised, and the door closes at a constant speed using gravity.
- Before the brake is released, the siren sounds (for the duration of the warning, see parameter **T3**).
- If during the closing process pressure is applied to the safety edge, the Y1 operating current brake is switched on and the door is held open.
- When the safety edge is released, the Y1 current brake is re-energised and the door closes to the final CLOSED position. At this moment the alarm siren is silenced.
- As soon as the S5 pre-limit switch (CONTACT) is engaged, the closing edge is bypassed.
- To use the door in motor operation mode, the fire alarm must be deactivated using the S8 START button. The indicator will light.
- Motor operation is possible only when the smoke detector circuit is closed again (PLC input I1 = 24V).

4.2 Fire detection with defective safety edge

- The closing process will continue **without personal protection** until the final CLOSED position.
- The closing process is initiated only from the open state, i.e. the closing edge safety device must indicate an error in the OPEN position.
- Malfunction of the safety edge is signaled acoustically, which is indicated only in the OPEN end position.
- The alarm siren is cancelled after the period specified in **T2**. This alarm can also be preemptively cancelled via the S8 START button.
- Malfunction pre-warning is described in section **4.1**

5 Special functions

5.1 Automatic timed closure

- Automatic closing can only be initiated from OPEN position.
- After the hold open time ends (parameter **T6**), the warning phase begins (parameter **T3**). Then the door closes.
- When the safety strip is activated during the CLOSE movement, the door reverses direction to the upper end position.

Conditions for automated timed closure:

- Times **T3** and **T6** are set.
- Automatic timed closure is selected (parameter **C1 = 2**).
  C1=1 no automated closure.
- "Self-latching" operation mode is selected (employ C-bridge)
- Closing edge intact and not actuated
- No fire alarm via fire or smoke detectors
- Door in end position OPEN
- No Continuous OPEN command

5.2 Warning light function

The warning light is turned on:

- in the event of pre-warning prior to closing (motor operation and fire alarms)
- during the CLOSE motion (motor operation and fire alarms)
- during the OPEN motion (only motor operation)

The warning light can be set to continuous or timed mode (parameter **C3**). **C3 = 1** continuous signal, **C3 = 2** timed

5.3 Fire closure

- The door is closed beyond the CLOSED end position.
- After passing the CLOSED end position, there is delayed closure of the Y1 operating current brake in the lower end position. The roller shutter profiles are stacked in place, providing a fire-resistant seal.
- The delay of the braking mechanism is triggered only when a fire alarm is activated, and can be set in parameter **T4** .

6 Zelio Logic A1 Programmable Logic Controller (PLC)

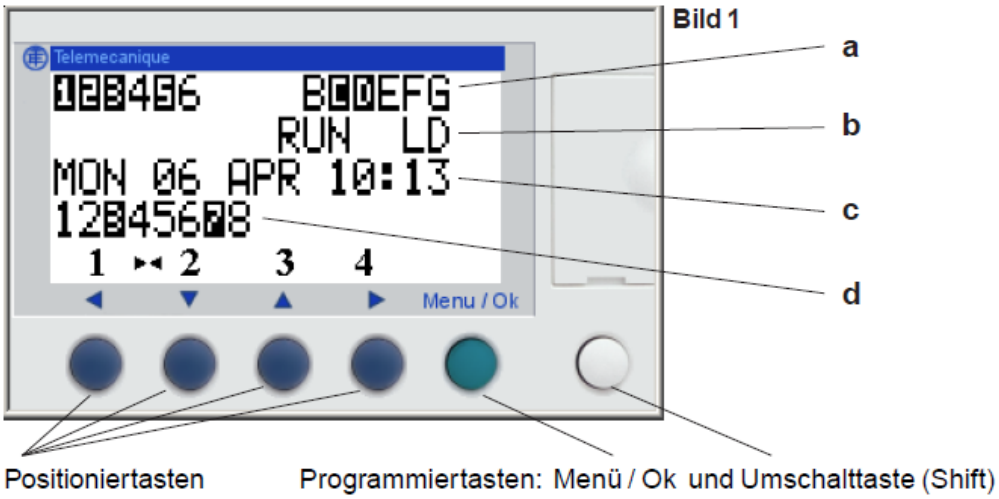


Bild 1	**Figure 1**
Positioniertasten	Cursor keys
Programmiertasten: Menü / Ok und Umschalttaste (Shift)	Programing keys: Menu/OK and Shift

6.1 Display information

a - Inputs: **1** to **6** and **B** to **G** for inputs I1 to IG. Active inputs are displayed in black (see 1, 2, 3, C, D).

b - RUN or STOP mode.
RUN = ready for operation

c - Date and time

d - Outputs: **1** to **8** for outputs Q1 to Q8. Active outputs are displayed in black (see 3 and 7).

The display should indicate inputs/outputs (Fig. 1).
In the event of a malfunction or text notification the display changes to the current message.
Pressing the Shift and Menu/OK keys provides a constant switching between the two displays.

6.2 Cursor key functions

◂ 1	Activated (press and hold)	Activate brake manually
◂ 1	Pulsed	Interrupt loading phase
▾ 2	Activated (press and hold)	CLOSE (Dead man)
▴ 3	Activated (press and hold)	OPEN (Dead man)
▸ 4	Pulsed	Battery voltage display (multiply by 3.75)

6.3 Display information for inputs

1 closed	1 open	Smoke switch and fire alarm circuits
2 closed	2 open	Stop and safety chain
3 Not activated	3 Activated	S3 limit switch ON
4 Not activated	4 Activated	S4 limit switch OFF
5 Ready for operation	5 Activated	Safety strip
6 Activated	6 Not activated	OPEN button
B Activated	B Not activated	CLOSE button
C Available	C Power failure	Mains voltage
D Activated	D Not activated	S8 START button
E Jog switch OPEN/CLOSED (C-bridge)	E Dead man's CLOSED (no C-bridge)	Pulsed operation (latch OPEN/CLOSE)
	F Input with programmed shutdown thresholds	U Battery
G Activated	G Not activated	Pull switch or radio ON / OFF. Connection must be made directly to IG input.

6.4 Display information for output

1 switched ON	1 switched OFF	K1 contact ON
2 switched ON	2 switched OFF	K2 contact OFF
3 connected	3 open	Battery circuit connected
4 Brake released	4 Brake applied	Brake control system
5 Forced closure	5 OFF	Brake control with defective safety edge
6 ON	6 OFF	Siren/warning light
7 Activated	7 OFF	Display ready
8 Activated	8 Malfunction warning	Warning - no potential

7 Changing parameters

- From Figure 1 activate Menu/OK button

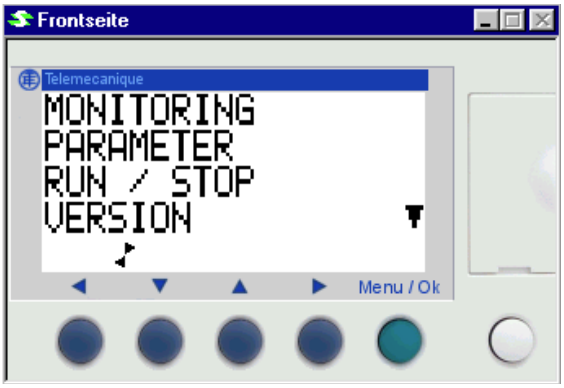
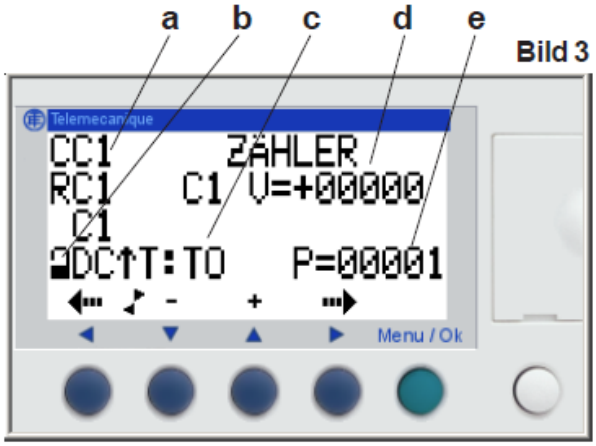
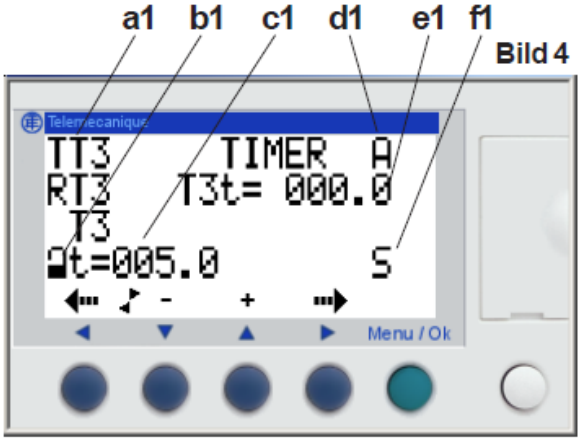


Figure 2

- Use the button to ▼ select PARAMETER (line flashes)
- Press the Menu/OK button

The ▲ key displays all logical components in the row. First **CC1** appears (of the C1 - C6 scale), then **TT1** (of the T1 - TC scale).





With the ▲ key select the **e** or **c1** field, which is flashing, and to change the value with ▲▼. Confirm changes with the Menu/OK key.

a - C1 command input counter (line flashes)
b - The padlock prevents locked parameters from being changed.
(Open padlock like with C1 = enable)
c - Counting mode: T0 = counting up; FROM = counting down
d - current counter value
e - Counter value for C1. Use the ► key (flashing) to select and the ▲▼ key to change values.

a1 - Command input timer T3 (line flashes)
b1 - The padlock prevents locked parameters from being changed.
(Open padlock as with T1 = enable)
c1 - Timer value: Activation/shutdown delay
d1 - Type A timer = activation delay, B = quick pulse, C = shutdown delay
e1 - current timer value
f1 - Unit time S = seconds

Figure 5

Back to main menu (Figure 1), confirm by pressing Menu/OK twice.

8 Selecting parameters

C1 **P=00001** no automatic closure
P=00002 select automatic closure

C2 **P=00001** Dead man's operation in both directions
P=00002 Dead man's OFF, Self-latching ON

C3 Siren/warning light
P=00001 Continuous signal
P=00002 Timed signal

T1 **Reversing time (delay until re-opening).**
The reversing time must be set so a permissible closing force is applied in response to the safety strip.
Factory setting T1 = 0.4 s

T2 **Duration of "Defective safety edge" message (siren or signal light)**
Safety edge malfunctions are transmitted in the top end position so the issue can be resolved. The message can be aborted using the S8 START key.
Factory setting T2 = 24 hours

T3 **Duration of the pre-warning phase**
Time setting = length of pre-warning phase. The pre-warning phase is activated in the event of fire alarm (fire alarm or discharge) or automatic timed closure (if programmed). The pre-warning is issued through output Q6 of the PLC.
Factory setting T3 = 5 s

T4 Brake delay
The brake is closed after a brief delay in the lower end position. The roller shutter profiles are stacked for fire resistance. The delay is only activated in the event of fire alarm.
Factory setting T4 = 0.01 s

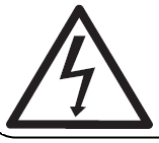
T5 Fire alarm in the event of power failure
After a prolonged power failure, the door will close after the specified time.
The display will indicate "Power failure". The current duration of the power failure is shown at the bottom of the display and the set T5 value is shown.
The S8 START indicator light will switch off and will remain off until power is restored.
Factory setting T5 = 2 hours

T6 Hold open time
From 0 - 999 s. During the stipulated holding period, the display shows the message "Hold open time".
Factory setting T6=30 s

T7 Charging phase
The battery circuit is opened when the batteries have lost significant charge (< 21 V) due to the power failure. After power is restored, the PLC is started up and a rapid charge phase is initiated. The brakes, as the greatest consumer of electricity, are switched off for a period of time. The display will indicate "Charging phase". All door functions are disabled for the duration of T7.
Factory setting T7 = 300 s
The charging phase can be cancelled by pressing the ◄ key as long as the door is closed (maintenance works).

T8 Duration of the malfunction warning
Up to two errors can be displayed.
Factory setting T1 = 3 s

9 Operation/start-up



WARNING!
All electrical work must be done with the power shut off.

9.1 Connect the control system to the ELEKTROMAT® and external devices with the power off.

9.2 Switch on power and connect the batteries according to terminal plan 3 (proj. 21200051). Attach the loose blade terminals to the battery terminals. The (+ and -) connecting cables to the battery are not interchangeable. Monitor the battery voltage. Press the ► button on the PLC and multiply the displayed value by 3.76. The result should be about 26-27 V.

9.3 This indication appears at initial start up (Figure 6). The control system is in the charging phase and remains locked for the duration of T7 (Factory setting 300 s). After T7 has timed out, the displays automatically returns to the main menu (Figure 1).

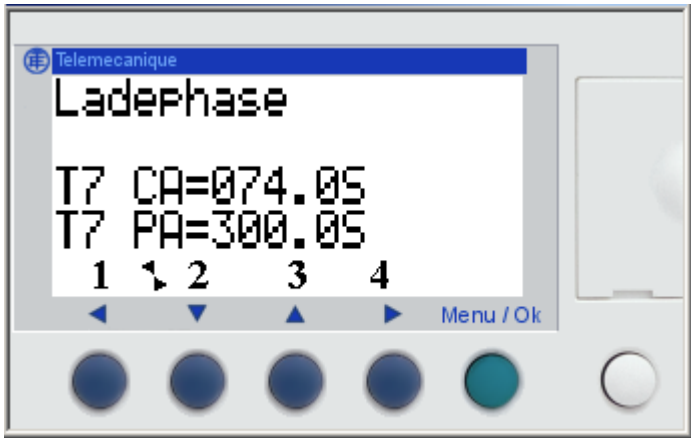


Figure 6

9.4 Reported errors are removed from the display.

9.5 Press the S8 START key in the cabinet door. The LED lights up.

9.6 Check the direction of rotation of the ELEKTROMATEN. Press the ▲ key and the door should move up with relay K1.

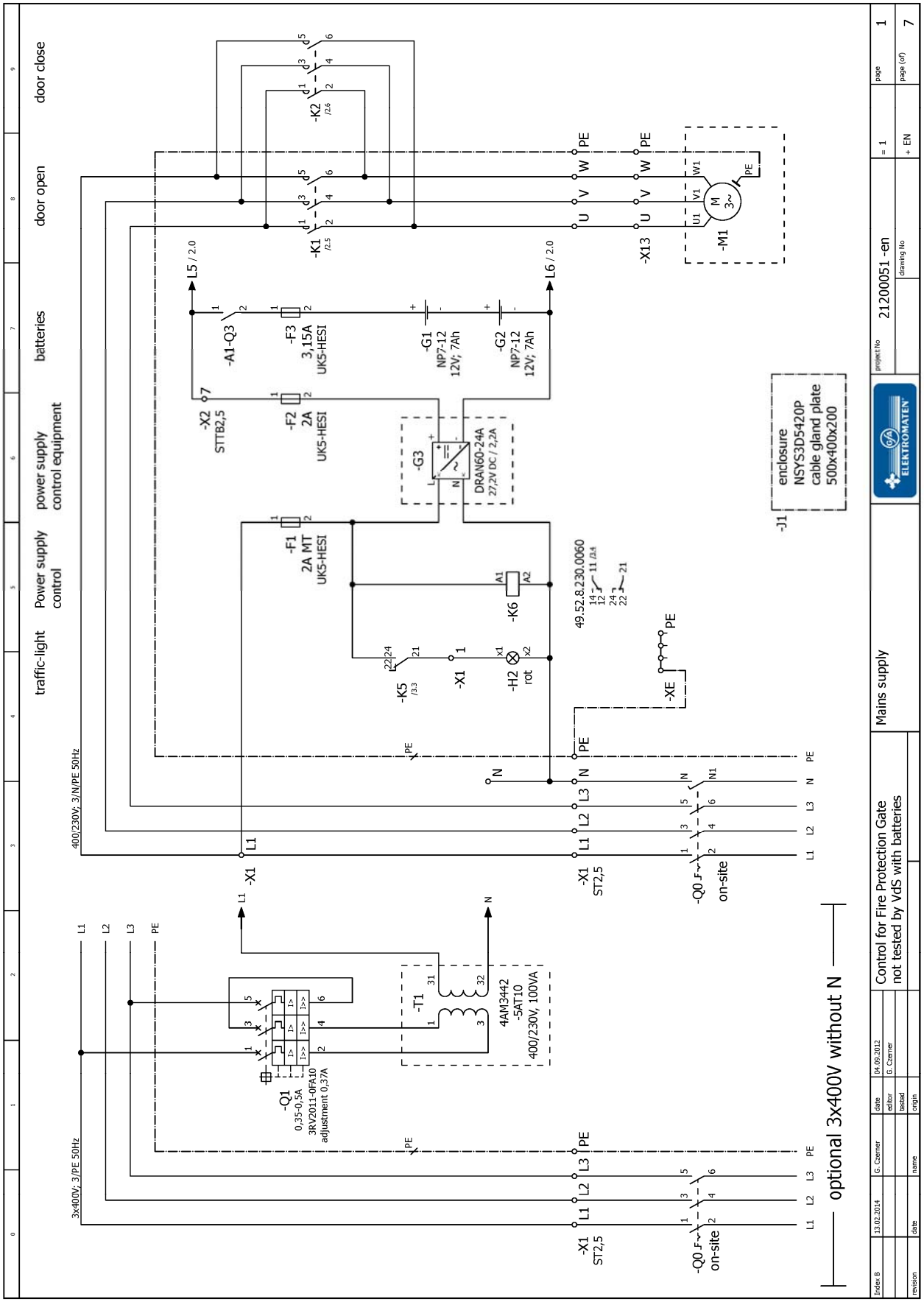
9.7 Adjust and fix the limit switch. The S5 pre-limit switch turns off the safety strip in the lower section, and must engage ca. 5 cm before the S4 operation stop limit switch.

9.8 Check the function of the controller and the safety strip in both modes (motor and fire protection). Engage with C-bridge latch.

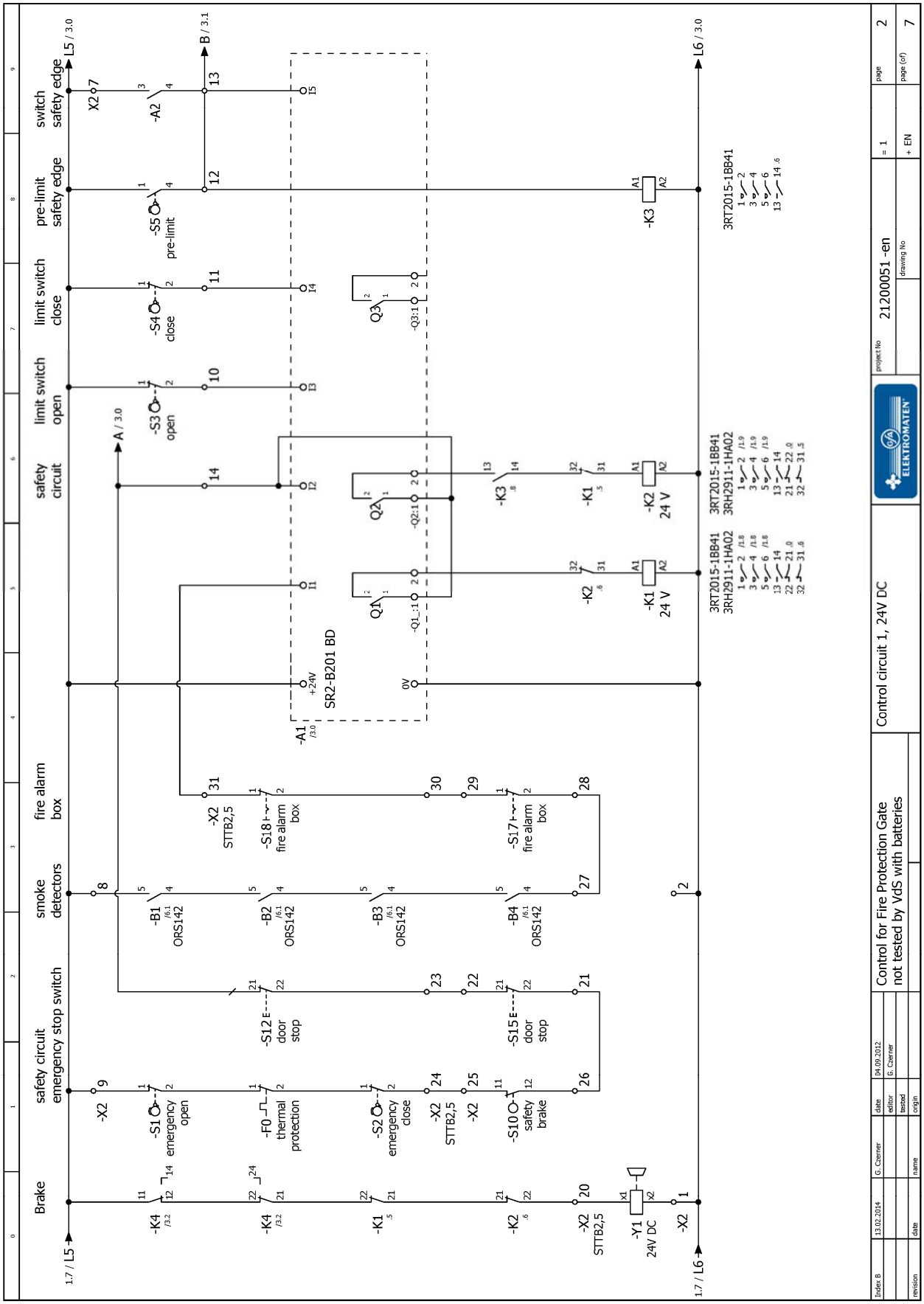
9.9 Adjust parameter C1, C3 and T1. Set T8 as desired.

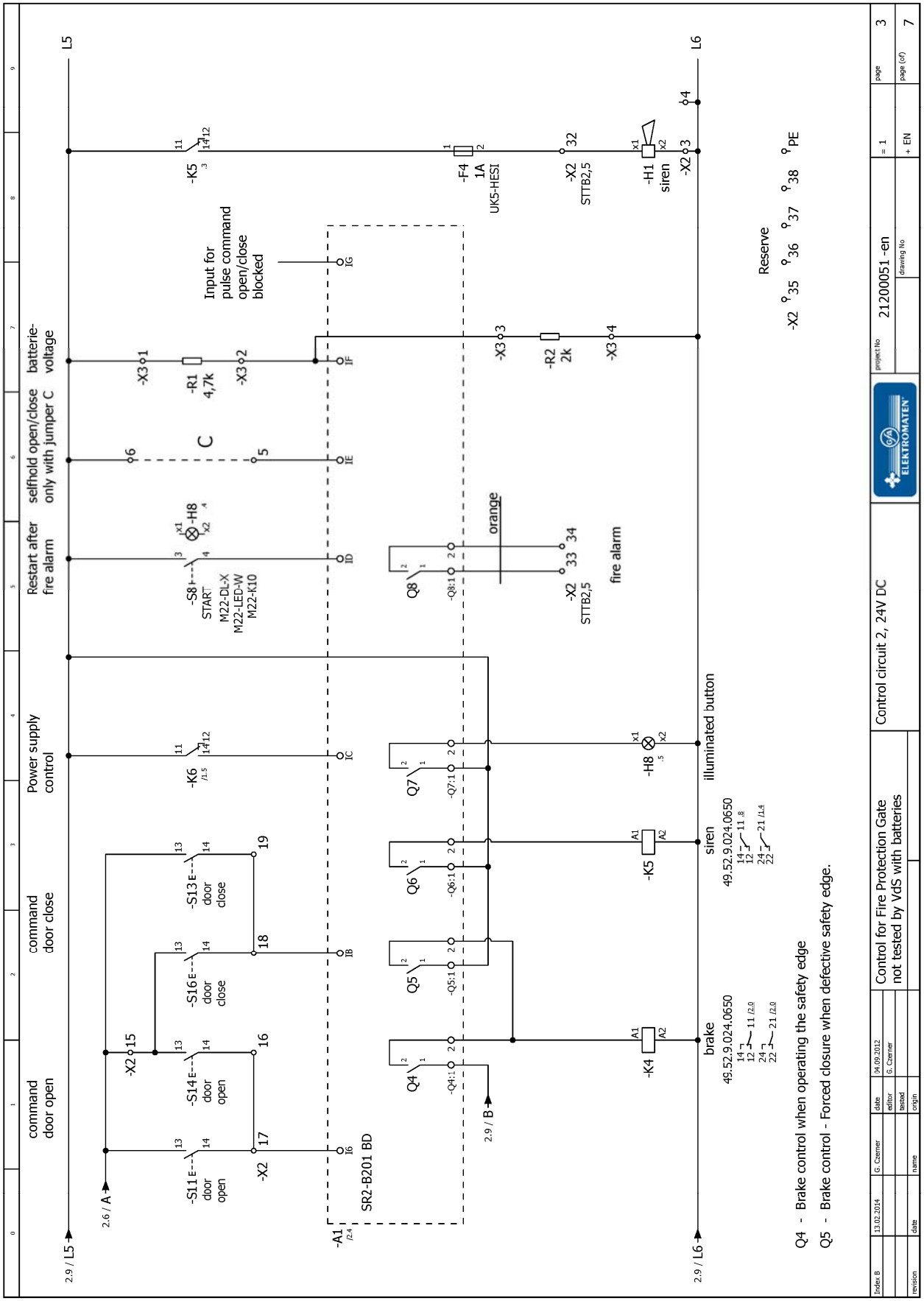
9.10 Simulate power failure (fuse F1), and check the battery.

10 Wiring diagram main supply

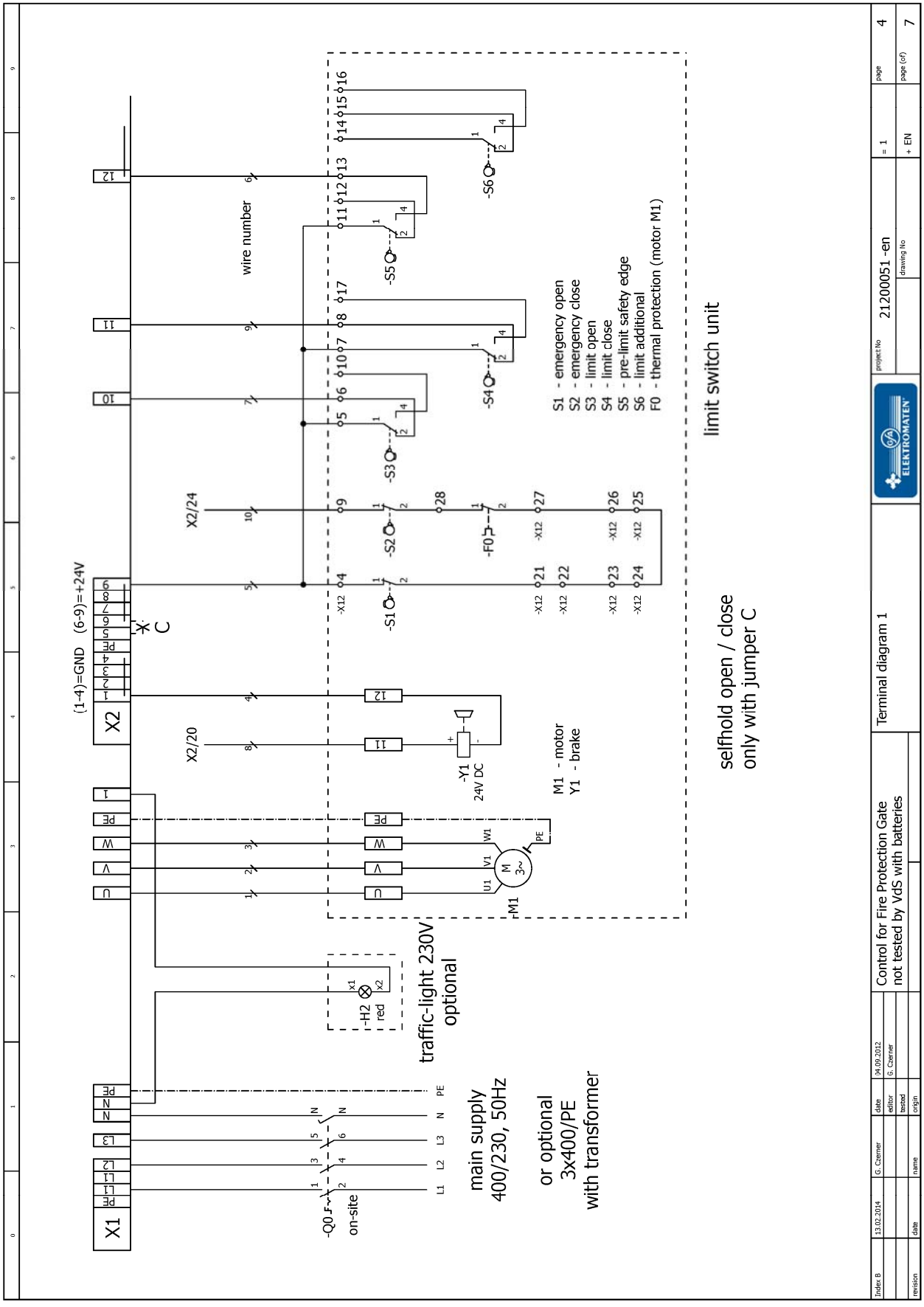


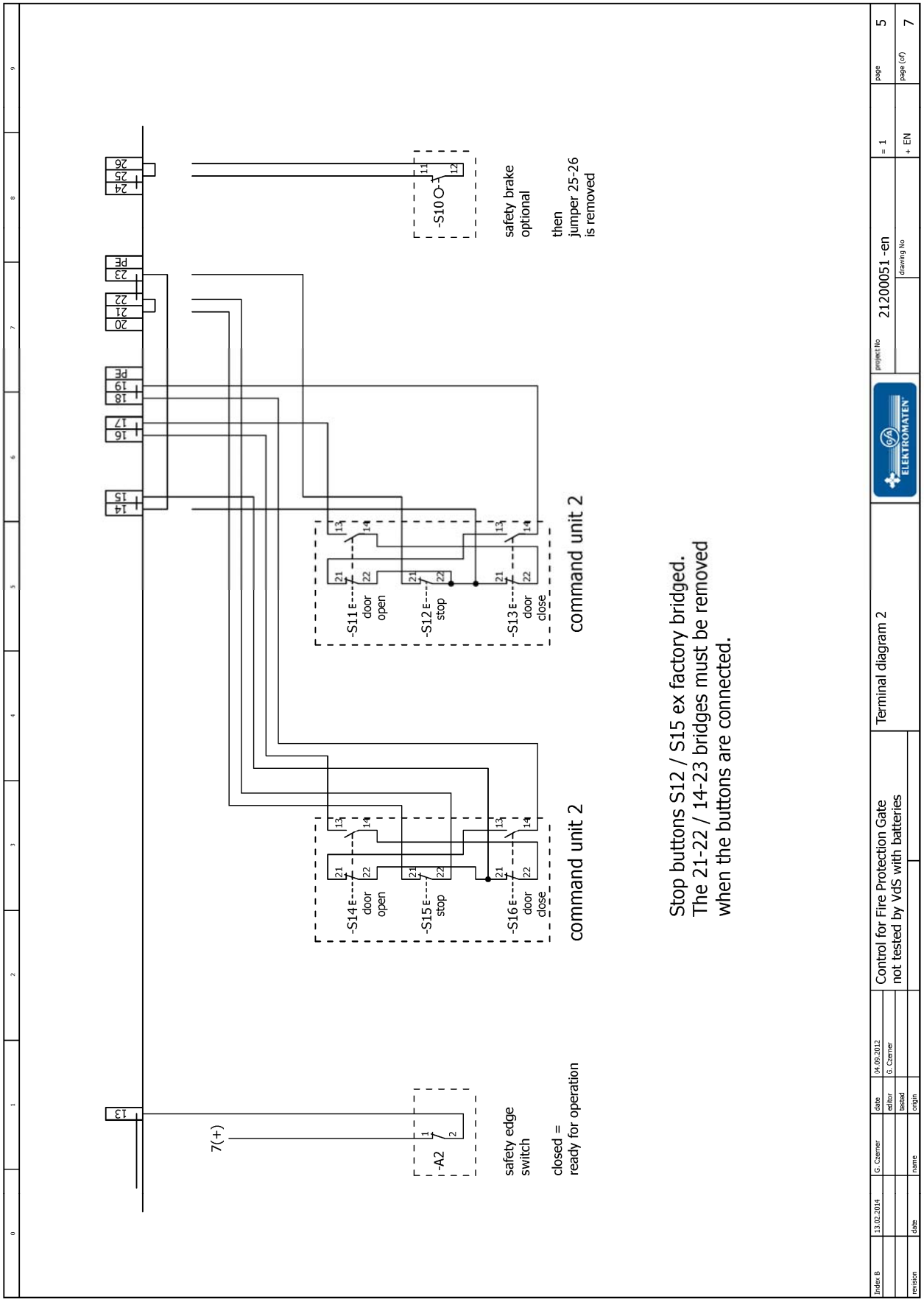
11 Wiring diagram control circuit

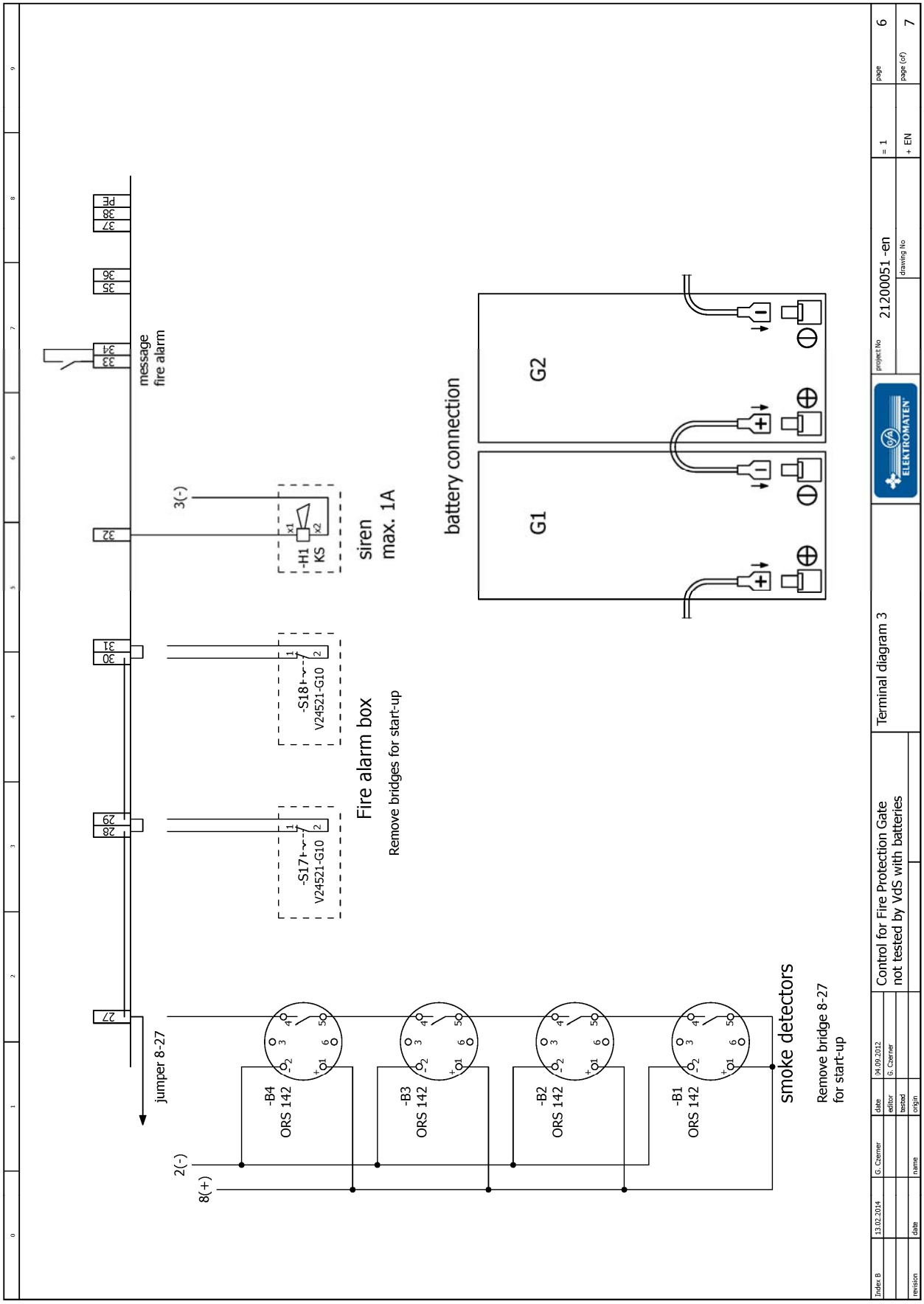



L5
L6
command door open
command door close
Power supply control
Restart after fire alarm
selfhold open/close only with jumper C
batterie-voltage
Input for pulse command open/close blocked
-S11 door open
-S14 door open
-S16 door close
-S13 door close
-X2
-A1 SR2-B201 BD
-K6
-K4
-K5
-S8 START M22-DL-X M22-LED-W M22-K10
-H8
-R1 4,7k
-R2 2k
-F4 1A UK5-HESI
-X2 STTB2,5
-H1 siren
-X3
-X2
Q4
Q5
Q6
Q7
Q8
orange
fire alarm
brake 49.52.9.024.0650
siren 49.52.9.024.0650
illuminated button
Reserve
PE
2.6 / A
2.9 / B
2.9 / L5
2.9 / L6
Q4 - Brake control when operating the safety edge
Q5 - Brake control - Forced closure when defective safety edge.
Control for Fire Protection Gate not tested by VdS with batteries
Control circuit 2, 24V DC
21200051 -en
ELEKTROMATEN
G. Czerner
13.02.2014
04.09.2012
Index B

12 Terminal diagram




7(+)
13
-A2
1
2
safety edge switch
closed = ready for operation
-S14
door open
-S15
stop
-S16
door close
command unit 2
-S11
door open
-S12
stop
-S13
door close
command unit 2
-S10
safety brake optional
then jumper 25-26 is removed
Stop buttons S12 / S15 ex factory bridged.
The 21-22 / 14-23 bridges must be removed
when the buttons are connected.
Control for Fire Protection Gate
not tested by VdS with batteries
Terminal diagram 2
ELEKTROMATEN
project No
21200051 -en
drawing No
= 1
+ EN
page
5
page (of)
7
Index B
13.02.2014
G. Czerner
04.09.2012
G. Czerner
date
name
edited
tested
origin
revision


message
fire alarm
siren
max. 1A
-H1
KS
Fire alarm box
Remove bridges for start-up
-S18
-S17
V24521-G10
battery connection
G1
G2
jumper 8-27
2(-)
8(+)
-B4
ORS 142
-B3
ORS 142
-B2
ORS 142
-B1
ORS 142
smoke detectors
Remove bridge 8-27
for start-up
Control for Fire Protection Gate
not tested by VdS with batteries
Terminal diagram 3
21200051 -en
ELEKTROMATEN

13 Assembly plan

Control for Fire Protection Gate; Art. No: 20002912

Pos.	Identifier	Amount	Description	Type	Manufacturer	Art. No - GfA
1	A1	1	Control unit "Zelio Logic" (6+6) E / 8A, 24V DC	SR2-B201 BD	Schneider electric	40014481
2	F1, F2, F3, F4	1	Disconnect levers fuse terminal	UK5-HESI	Phönix	
3	G1, G2	2	Batterie 12V; 7Ah	NP7-12	YUASA	40013813
4	G3	1	Power supply control equipment 27,2V; 2,2A	DRAN60-24A	TELE Steuergeräte	40016111
5	J1	1 1	Enclosure 500x400x200 Cable gland plate	NSYS3D5420P 145-130	Schneider electric Köhler	
6	K1, K2	2 2	Main contactor 3kW; 24V DC Auxiliary switch block 6A, 2Ö	3RT2015-1BB41 3RH2911-1HA02	Siemens	
7	K3	1	Main contactor 3kW; 24V DC	3RT2015-1BB41	Siemens	
8	K4, K5	2	Relay 49 series 24V 8A with socket	49.52.9.024.0650	Finder	
9	K6	1	Relay 49 series 24V 8A with socket	49.52.8.230.0060	Finder	
10	H8, S8	1 1 1	Illuminated button neutral LED-element 12-30V AC/DC switching element 1S	M22-DL-X M22-LED-W M22-K10	Eaton	
11	X1	10 3	Spring-cage terminal 2,5mm² Spring-cage ground terminal 2,5mm²	ST2,5 ST2,5-PE	Phönix	
12	X2	19	Double level pull spring terminal 2,5mm²	STTB2,5	Phönix	
			Optional at 3x400V without neutral (N)			
13	Q1	1	Motor protecting switch 0,35-0,5A	3RV2011-0FA10	Siemens	
14	T1	1	Transformer 400/230, +/-5%, 100VA	4AM3442-5AT10-0FA0	Siemens	40010040

15 Fault message

Display	Cause	Troubleshooting
Safety circuit	Safety circuit made up of: - S1, S2 emergency limit switches - S12, S15 stop buttons - S10 safety catch - F0 thermocontact Contact open	Check the connections of the individual contacts / components of the safety circuit. Check the switching sequence of the limit switch pairs S1/S3 and S2/S4. Operating limit switches S3/S4 must connect before the end limit of S1/S2.
Power failure	Shut off relay R6 for network monitoring. There is no power.	Check the power supply cable. F1 fuse defective
Interruption < 23 V	Low battery voltage (23 V L), charging rectifier error.	Check the rectifier and fuse F2. Battery capacity is insufficient. Change the batteries.
Unit defective	Contact strip activated or coiled cable disconnected.	Possibly replace contact strip or repair coiled cable.
Opening time	Active time closing message. Appears only if C1 = 00002	Removal not required.
Charging phase	Message appears when controller switched on. Control system is locked during the charging phase (T7). S8 START key is unoperational	Message automatically turns off after T7 times out. Can be aborted to end position using the ◄ key.
Battery voltage	To check the battery power button press ► . Display value multiplied by 3.75.	Release the ► key.

16 Technical data

16.1 Fire Door Holder

Dimensions	400 x 500 x 200 (B x H x T) [mm]
Mains supply	400 / 230V -15% + 10 %; 3 x 400V without N; with integrated transformer T1 400/230V
Frequency Range	47 - 63Hz
Control voltage	24V DC
Supply external devices (smoke detectors)	24V max. 150mA
Siren	24V max. 25W
Traffic-light	230V max. 40W
Working temperature	+5...+50°C
Storage temperature	-20... +85°C
Batteries	VdS - approved, maintenance free batteries 2 x 12V - 7Ah
Digital outputs (potential free)	max. 30V / 1A
Weight control	19,0 kg
Weight of the batteries	2 x 2,40 kg

16.2 Controller “Zelio Logic” A1

Supply	24V/DC
12 inputs	24V digital (I1...IE) 0...10V analog (IF)
8 outputs (potential free)	8A thermal current 24V / 1,5A - DC 12 24V / 0,6A - DC 13
Status display	Display (for the inputs and outputs)
Readout up	Inputs (alphanumeric)
Readout down	Outputs (numerically)
Readout	Inputs and outputs, parameter, error

17 Declaration of conformity

Declaration of incorporation

in the terms of Machinery Directive 2006/42/EC
for partly completed machinery, Appendix II Part B

GfA ELEKTROMATEN GmbH & Co. KG
Wiesenstraße 81 · 40549 Düsseldorf
Germany

Declaration of conformity

in terms of EMC Directive 2004/108/EC

We, the

GfA ELEKTROMATEN GmbH & Co. KG

hereby declare that the following products are conform with the above EC Guideline and are only intended for installation in door equipment.

Steuerung Nr. 20002912 für Feuerschutzabschlüsse

Standards applied

DIN EN 54	Fire detection and fire alarm systems - Part 5 : Heat detectors; Point detectors - Part 7 : Smoke detectors - Point detectors using scattered light, transmitted light or ionization
DIN EN 61000-6-2	Electromagnetic compatibility (EMC) Part 6-2 Generic standard – Emission standard for industrial environments
DIN EN 61000-6-3	Electromagnetic compatibility (EMC) Part 6-3 Generic standard – Emission standard for residential, commercial and light-industrial environments

We undertake to transmit in response to a reasoned request by the appropriate regulatory authorities the special documents on the partly completed machinery.

Authorised representative for the compilation of the relevant technical documents

(internal EU address)

Dipl.-Ing. Bernd Synowsky

Documentation representative

Incomplete machines within the meaning of the EC Directive 2006/42/EC shall only be intended to be integrated into other machines (or into other incomplete machines/systems) or to be assembled with them to form a complete machine within the sense of the Directive. Therefore, this product cannot be commissioned before it is determined that the entire machine/system to which it was integrated shall comply with the provisions of the Machinery Directive indicated above.

Düsseldorf, 01.12.2014 **Stephan Kleine**

CEO

Signature