

SKY ELEVATOR

CX Series Lift Control System

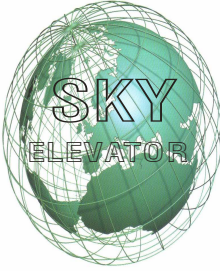


USER MANUAL

CX SERIES LIFT CONTROL SYSTEM

USER MANUAL

VERSION : 1.4



SKY ELEVATOR

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PREFACE

CX Series Lift Control System has been designed to fulfil the needs of lift sector at new age. One of the main aims of this series is to integrate lift control system with today's advanced computer systems.

CX Series Lift Control System is controlled by a 16-bit high performance microcontroller. It works in one speed, two speed and VVVF systems.

In this manual you find information about using CX Series Lift Control System and technical documents and schematics. If you think that this manual is not enough or it is not compatible with hardware or software version of your system, you can download latest version of the manual from Sky Elevator's website (www.sky-elevator.com) or send an e-mail to request by mail.

We will continue to develop this product with your support and suggestions. Therefore if you face any problem while using this product or if you have any suggestions to make it better, please inform us by e-mail (sky@sky-elevator.com).

Sky Elevator

GENERAL DESCRIPTION

A) CX SERIES BOARDS AND THEIR FUNCTIONS

a) CXA Main Board

This board is the main board of the system. It contains microcontroller, main inputs and outputs, 16 I/O for call registers, 7-Segment display, keypads and signal lamp drivers.

b) RLE

This board contains 2 programmable inputs and 4 programmable output relays. It is an optional board and only used when extra input or output is required.

c) SWPI

It is the I/O board for the call registers. One board contains 16 I/Os. Each channel is input for buttons and output for call register lamps. The number of SWPI required in a system depends on the total number of buttons required. This board is connected to the main board via the parallel bus.

d) SWPOR

SWPOR board contains 8 relays for output. It is possible to use more than one SWPOR board which can be programmed up to two different purposes at the same time. This board is also connected to the main board via the parallel bus.

e) CXX

It contains terminals of panel. Input signals from shaft and display outputs are connected via this board.

f) HTT

Hand terminal with LCD for parameter monitoring and setting.

B) PANEL VOLTAGE INFORMATION

- a. Safety Circuit Voltage:** Depends on the contactor coil voltage. Maximum allowed voltage is 230V AC. Minimum 100 VA power supply is required.
- b. Signal Voltage:** 24V DC is used for signal lamps and control of relays on the boards. The current of this supply is mainly determined by the current requirements of the pushbuttons used in the system. Minimum 100 VA power supply is required.
- c. Microcomputer Voltage:** 10V AC is required for the power supply of the microcomputer circuit. Maximum 1A capacity is enough. Minimum 25 VA power supply is required.

C) INPUTS AND OUTPUTS

The power supply for signal and control is 24V DC. All inputs except safety circuit monitoring are active low. It means that an input signal is active if it is connected to the return (0V) of 24V circuit. All inputs are 100% galvanically isolated from the microcomputer circuit. The outputs are mainly made of relays. Some inputs/outputs are dedicated to a special purpose and some of them are user programmable.

OUTPUT TERMINALS AND THE MEANINGS OF THE ABBREVIATIONS

100	Signal Circuit Supply (+24V DC)	DTS	Open Door Button
1000	Signal Circuit Ground	K20	Close Door Button
10AC	10V AC Voltage	DCM	Door Signal Common
L1-R, L2-S,L3-T	Main Phases	CLS	Close Door Signal (Automatic Door) Open
MP/N	Neutral	OPN	Door Signal (Automatic Door)
110	Safety Circuit Supply	A,B,...,G	Right Display Segment Outputs
120	Stop Circuit Return	2BC(1),2G(-)	Left Display Segment Outputs
130	Door Contacts Return	K1, K2	VVVF System Motor Output Contactors
135	Automatic Cabin Door Contact Return	KF	VVVF System Break Contactor
140	Door Locks Return	RU	Up Direction Contactor
150-151	Safety Circuit Common	RD	Down Direction Contactor
18AC	18V AC Voltage	RH	High Speed Contactor Low
840	Positive Terminal of Brake	RF	Speed Contactor
804	Overload Input	500	Inspection Down Motion Button
805	Full Load Input	501	Inspection Up Motion Button
802	Half Load Input	869	Inspection Input Signal
FKK	Phase Failure Detector Input	RUN	Frequency Input in VVVF
M0	Counter	DER	Device Error in VVVF
MK	Floor Detector	CNT	Contactor Control Input
2000	Negative Terminal of Brake	D1,D2,D3	Break, Pump and Signal Circuit Bridge Diodes
2001	Positive Terminal of CAM	VK	Contactor Supply Voltage Input
810	Negative Terminal of CAM	R-N	Phase-Neutral Line Input (Before Phase Protection Relay and Main Switches)
817	Lower Limit (End of Fast Speed Way)	1	Phase Line Output For Cabin (220V AC)
818	Upper Limit (End of Fast Speed Way)	2	Phase Line Output For Cabin Lamp (220V AC)
SXX	Fuses	AL	Automatic Door Open Limit
SFP	Brake and Cam Fuse	KL	Automatic Door Close Limit
SK	Contactor Fuse (220V AC)	S1	Programmable Output Relay
SKL	Cabin Lamp Fuse	O1,O2,O3	Programmable Output Relay on RLE
SWCX	Safety Line and Contactor Supply Fuse	12	Busy Signal
U1,V1,W1	Motor High Speed Inputs	31	Down Arrow Signal
U2,V2,W2	Motor Low Speed Inputs	32	Up Arrow Signal
FKK/AFK	Phase Failure Detector Board	35	Overload Signal
FAN	Supply Voltage for Motor Fan	39	Out Of Service (Inspection) Signal
T1-T2	PTC Motor Thermistor Terminals	C0,C1...C16	Registration Button Inputs/Register Lamp Outputs
TMS	Thermal Magnetic Circuit Breaker	VTM	Watman Input
TR	Thermal Relay	FIRE	Fire Input
190	Hall Call Common For Simple Push Button	FOT	Photocell Input
I0,I1,I2	Programmable Inputs	870	Electrical Emergency Operation Switch
COM	Common of Register Lamps		

PROGRAMMING CX SERIES

System parameters of CX Series lift controllers can be observed and modified easily by using three buttons located on the electronic board. These buttons are named as follows:

↓ **ENT** ↑

A) MODIFYING PARAMETERS

You have to hold your finger pressed onto the (ENT) button until you see the following display on the board displays

(ENT).....(ENT)

PAd

Here you see **P** flashing. Press (ENT) button once to enter programming the parameters. You will see the following screen:

n00

Now the system is in programming mode. You can analyse all parameters. This display structure (letter 'n' in first display) shows the program number ('00' in this example, left two displays). The programs with the numbers 00...15 are used for hall and cabin display patterns. Other programs are used as system parameters in controller.

In order to see or modify the data stored in a program number, first you have to find it. When you entered the programming mode first you see a display exactly as above. You can increase program number by pressing (↑) button or decrease it by pressing (↓) button shortly. But when you have reached lower and upper limits then the program number cycles to the opposite limit.

For example let us assume the display shows program 21 as follows:

n23

(↓)

n22

(↓)

n21

In order to see the data stored in a program cell you have to press (ENT) button shortly.

n21

(ENT)

008

Now the display shows the data stored in program number 21. As an information program number 21 stores the number of stops (floors) in the system. So this controller works with 8 stops.

In order to increase or decrease the data (the number of stops in the system) first get it to inspection mode and then use (↑) and button (↓) exactly as in program finding procedure

(↓)

007

(↓)

006

After setting the data (found the number in display which corresponds to the number of stops in the controller) press (ENT) button once to return to the previous level (program selection level).

(ENT)

n21

You can observe and/or modify as many programs as you want in one programming session. Be aware that modified data until now is not written to the EEPROM (permanent memory). The modified data is still in RAM (temporary memory). But when you exit from program selection level by pressing (ENT) button long enough then system leaves the programming mode and last configuration is stored into EEPROM and the controller uses these new parameters in operation. After this point any power breakdown does not influence the parameter memory.

When you exit from programming mode by holding (ENT) button down until the display shows the current floor of car, then system is ready to function as a controller again.

(ENT).....(ENT)

3

Where 3 stands for floor number

B) PARAMETER LIST

n0...15	Digital display codes for floors 0...15
n20	Programming codes
n21	Number of stops
n22	Lift traffic system
n23	Lift door type
n24	Definition of parking floor
n25	Parking floor
n26	Maximum door lock waiting time
n27	Selection for automatic door open/closed wait state at floor (Only in full automatic door)
n28	Busy time
n29	Automatic door open waiting time
n30	Waiting time in floor before departure for the next floor (only in collective models)
n31	FIRE stop
n32	Maximum floor transition period (High Speed)
n33	Maximum busy period
n34	Definition of error reporting
n35	Display output type
n36	Software version
n37	MK Delay
n38	Start up delay
n39	Slow speed travel period
n40	Door open period
n41	Park time
n42	System blocking after errors
n43	Number of doors in car
n44	Door A definition (0-7 floors)
n45	Door A definition (8-15 floors)
n46	K20 Delay
n47	Lift type
n48	Maximum number of errors
n49	Period to inhibit door close button
n50	Delay to operate door close command
n51	Programmable output (S1-On CXA board)
n52	Programmable output (O1-On RLE board)
n53	Programmable output (O2-On RLE board)
n54	Programmable output (O3/O4-On RLE board)
n55	Programmable input (I0-On CXX board)
n56	Programmable input (I1-On RLE board)
n57	Programmable input (I2-On RLE board)
n58	Door B definition (0-7 floors)
n59	Door B definition (8-15 floor)
n60	Maximum motor period
n61	Direction delay
n62	Open door delay
n63	Motor motion control period
n64	Brake delay
n65	Hall call cancelling
n66	Inspection switch selection
n67	Inspection speed selection
n68	Stop failure
n69	Relay board 1 (SWPOR definition)
n70	Relay board 2 (SWPOR definition)

PROGRAM 0...15 : These programs store the digital display codes for the corresponding floors. Program 0 holds the code for the floor 0 and program 6 the code for the floor 6. These codes control hall and cabin displays but not the display on mainboard. When you enter program 0...15 then you will see the characters to be displayed on the panels when the lift stays at that floor. Search with (↓) and (↑) keys all characters, which are possible to be displayed for the system.

PROGRAM 20 : This program does not store any data for any controller function. Program 20 is used to shortcut for some popular digital display configurations.

Here are allowed commands for program 20 and their functions:

1	This command shift all programs between 0...15 one step up. After executing this command program 0 is shifted to 1, program 1 is shifted to 2 and so on. For example a system like 0,1,2,3,4,... is 0,0,1,2,3,... after execution.
2	This command shift all programs between 0...15 two step up. After executing this command program 0 is shifted to 2, program 1 is shifted to 3 and so on. For example a system like 0,1,2,3,4,... is 0,1,0,1,2,3,... after execution.
3	This command shift all programs between 0...15 three step up. After executing this command program 0 is shifted to 3, program 1 is shifted to 4 and so on. For example a system like 0,1,2,3,4,... is 0,1,2,0,1,2,3,... after execution.
8	This command shift all programs between 0...15 one step down. After executing this command program 1 is shifted to 0, program 2 is shifted to 1 and so on. For example a system like 0,1,2,3,4,... is 1,2,3,4,5,... after execution.
11	This command fills the program memories 0 to 15 with the digital codes for numbers 0...15. So resulting digital codes are 0,0,1,2,3,4,5,...
21	This command organises digital display numbers as -1,0,1,2,3,...
22	This command organises digital display numbers as -2,-1,0,1,2,...
23	This command organises digital display numbers as -3,-2,-1,0,1,...
39	Delete all error reports.
57	Restore factory defaults.

PROGRAM 21 : This program holds the number of stops in lift system. You can enter any number between 2 and 16.

PROGRAM 22 : This program stores the parameter which decides the traffic system of the lift as follows:

Simple Push Button

Car and hall call buttons are connected together. There is no call register memory. No second call is registered when the system deals with a call. No group operation is allowed. Hall calls are not allowed in busy state.

Simple Collective

1 Car and hall call buttons are connected together. Call register memory is present. There is no difference between hall and car calls.

One Button Down Collective

2 Car and hall call buttons are connected separately. Car calls are collective in both directions where hall calls are collective in downwards. This configuration is useful in residential buildings where the main entrance is in the base floor.

One Button Up Collective

3 Car and hall call buttons are connected separately. Car calls are collective in both directions where hall calls are collective in upwards.

Two Buttons Full Collective

4 Car, hall up and hall down buttons all are connected separately. Car and landing call are all serviced in full collective manner.

PROGRAM 23 : This program stores the parameter for lift door as follows:

- 0 Semi-automatic wing landing door, no cabin door
- 1 Semi-automatic wing landing door, with automatic cabin door
- 2 Full automatic cabin and landing door

PROGRAM 24 : This program defines the parking facility of the lift as follows:

- 0 No park floor is defined
- 1 System has a park floor where car waits with closed doors.
- 2 System has a park floor where car waits with open doors.

If this parameter is 1 or 2 then the car moves to defined park floor (program 25) when no call is present during defined time period (program 41) after last travel.

PROGRAM 25 : This program stores the parking floor if program 24 is 1 or 2. This number must be less than the number stored in program 21.

PROGRAM 26 : This program stores maximum time period (3.0 - 20.0 sec) to wait door lock to be closed after a door close signal is sent. The data is displayed in seconds and can be adjusted in 0.1 second steps.

PROGRAM 27 : The data stored in this program determines the behaviour of the door when the car is at floor level.

- 0 The car waits with closed doors in floor for automatic doors.
- 1 The car waits with open doors in floor. (Not conformity with EN81-1)

PROGRAM 28 : This program stores busy period (3.0 - 10.0 sec). The data is displayed in seconds and can be adjusted in 0.1 second steps.

PROGRAM 29 : This program stores the time period (4.0 - 15.0 sec) to wait doors to be open before reclosing them when the doors are full automatic. The data is displayed in seconds and can be adjusted in 0.1 second steps.

PROGRAM 30 : This program is used only in collective systems. It stores the parameter for the time period (3.0 - 10.0 sec) where the car waits before departure for the next call. The data is displayed in seconds and can be adjusted in 0.1 second steps.

PROGRAM 31 : This program stores the floor to where car goes in case of fire. After reaching fire-floor car waits there with open doors.

PROGRAM 32 : This program stores a parameter which stands for the maximum time (5.0 - 99.9 sec) allowed the car to move from one floor to the next one. If this time is exceeded then the car is stopped by the system and an error is reported (249). The data is displayed in seconds and can be adjusted in 0.1 second steps.

In case of any mechanical problem, which prevents the car from moving or any fault in floor detector occurs; system may cause some big problems if the motor is not switched off immediately. It is strongly recommended to adjust this function properly when the lift is in service.

PROGRAM 33 : This program stands for maximum busy time (0.0 - 99.9 sec). If the door stays open for a long time then the cabin light and busy signal are switched off after the period stored in this program. The data is displayed in seconds and can be adjusted in 0.1 second steps.

PROGRAM 34 : This program is used to control error reporting mechanism. The allowed numbers and their functions are as follows:

- | | |
|---|--|
| 0 | System reports all errors and stops the car . |
| 1 | Only safety circuit errors are reported and the car is stopped only in safety errors.
Secondary errors like 249, 250, 252, 253,... are not processed. |

PROGRAM 35 : This program is used to set display output to 7 segment digital display, gray code or binary code.

0 7 Segment Digital Display

1 Gray Code (M0/G-Segment, M1/F-Segment, M2/E-Segment, M3/D-Segment)

2 Binary Code (Bit0/G-Segment, Bit1/F-Segment, Bit2/E-Segment, Bit3/D-Segment)

PROGRAM 36 : This program displays the software version number.

PROGRAM 38 : This program stores a parameter which stands for a delay time (0.0 - 5.0 sec) during start-up. The data is displayed in seconds and can be adjusted in 0.1 second steps. The car waits for a time delay specified in this program after the door lock closed signal returns to the controller before activating contactors to start motion.

PROGRAM 39 : This program stores a parameter which stands for the time limit (5.0 - 30.0 sec) in slow motion. The data is displayed in seconds and can be adjusted in 0.1 second steps. When the car moves in slow motion and the time elapsed exceeds the parameter specified in this program then the car is stopped.

PROGRAM 40 : This program stores a parameter for door open time limit (0.0 - 10.0 sec). The data is displayed in seconds and can be adjusted in 0.1 second steps. When the door is activated to open and elapsed time exceeds the parameter specified in this program while the door is still closed then an error signal is generated and the door is deactivated.

PROGRAM 41 : This program stores a parameter which stands for the time (0.0 - 99.9 sec) to wait to move to the park floor. The data is displayed in seconds and can be adjusted in 0.1 second steps. When the car stays without receiving a call from any floor for a time period specified in this program then a cabin call is given automatically by the system.

PROGRAM 42 : This program stores a parameter which controls system lock after some errors. These parameters are as follows:

- | | |
|---|--|
| 0 | The system continuous operation. |
| 1 | The system is blocked if the number of consequent errors exceeds the number stored in the parameter n48. |
| 2 | All call registers are cleared. |

PROGRAM 43 : This program stores the number of doors present in the car as 1 or 2.

PROGRAM 44 : This program stores the stops (0...7) at which the first door (Door A) in the car is active. In order to calculate the data for this program you have to add the numbers for the stop at which the first door is active.

FLOOR	0	1	2	3	4	5	6	7
CODE	1	2	4	8	16	32	64	128

For example assume that we want the first door to be active at stop 0, 3, 4, 6 and passive at other stops.
To calculate the data, sum the codes for each stop:

Stop 0 :	1
Stop 3 :	8
Stop 4 :	16
Stop 6 :+	64

	89

If we enter 89 into to program 44 then the first door will be active only at Stop 0, 3, 4, and 6.

PROGRAM 45 : This program stores the stops (8...15) at which the first door (Door A) in the car is active. In order to calculate the data for this program you have to add the numbers for the stops at which the first door is active.

FLOOR	8	9	10	11	12	13	14	15
CODE	1	2	4	8	16	32	64	128

For example assume that we want the first door to be active at stop 9,10,13,15 and passive at other stops.
To calculate the data, sum the codes for each stop:

Stop 9 :	2
Stop 10 :	4
Stop 13 :	32
Stop 15: +	128

	166

If we save 166 into to program 45 then the first door will be active only at stops 9, 10, 13 and 15.

PROGRAM 46 : This parameter only Works in systems with automatic door. On signal in door open switch input (K20), it determines the time of door open signals. Time unit is second and can be set min 0,6 sec, max 8 sec.

PROGRAM 47 : This program defines the lift type

- | | |
|----|---------------------|
| 1 | One speed rope lift |
| 2 | Two speed rope lift |
| 3 | Not used |
| 4 | VVVF1 |
| 5 | VVVF2 |
| 6 | FUJI closed loop |
| 7 | RST |
| 8 | VVVF3 |
| 9 | KEB |
| 10 | DIETZ |

PROGRAM 48 : This program stores the maximum error (minimum 4) becomes continually. System will blocked if errors exceed this value.

PROGRAM 49 : This program controls the DTS (Close Door) button only in full automatic door systems. DTS (Door close button) is inhibited during the time period (0.0 - 10.0 sec.) given in this parameter. The period starts when the car reaches the floor. The data is displayed in seconds and can be adjusted in 0.1 second steps.

PROGRAM 50 : This program defines time period (0.0 - 2.0 sec) to delay the activation of retiring cam after the landing door has been closed for semi-automatic systems. The data is displayed in seconds and can be adjusted in 0.1 second steps.

PROGRAM (51...54) : There are 4 programmable relays in CX Series boards. S1 is standard in all systems. But other programmable relays (O1, O2, O3/O4) in RLE board are optional. Here are the details of the programmable outputs:

PROG. NO	CODE	PLACE	CONTACT V/I	CONTACT TYPE	DEFINITION
51	S1	RLX	220V/10A	Normally Open Common	Always programmable
52	O1	RLE	48V/3A	Normally Open	O1, O2 and O3/O4 relays are all have same common terminal. O3/O4 works in parallel.
53	O2	RLE	48V/3A	Normally Open	
54	O3/O4	RLE	48V/3A	Normally Open	

OUTPUT CODE	SELECTED CASE orFUNCTION
1	Stop circuit is closed (Terminal 120 is on)
2	Stop circuit is open (Terminal 120 is off)
3	System is in Inspection mode (Terminal 869 is on)
4	System is in Normal mode (Terminal 869 is off)
5	There is an error
6	There is no error, system works normal
7	The car is moving in Slow speed
8	The car is not moving in Slow speed
9	The car is not moving
10	The car is moving in any speed
11	The car is moving in Fast speed
13	Door Lock circuit is closed (Terminal 140 is on)
14	Door Lock circuit is open (Terminal 140 is off)
15	The cabin is at floor level
16	The car is staying in Rest and the cabin is at floor level
17	Direction is up
18	Direction is down
19	Busy
20	The system is moving or in START state
24	Waiting for park period
25	The system is in motion or in braking
26	Retiring cam. Door contacts are closed and there is motion.
27	In normal mode : The system is in motion or in braking In inspection mode : The system is in motion
30	The system is in motion or door lock is on.
31	This output is specially to drive the contactor in speed control systems.
32	There is no call registered.
33	ZERO SPEED output for VVVF drives. (JOG) The
39	system is in inspection mode and in motion
40,41,42,43	RESET output for a driver. This output is active as a pulse when a device error is detected (DER).
45	Gray Code M0, M1, M2, M3 outputs respectively
46	Door Close command input for the second door
47	Door Open command input for the second door
51	Gong
53	Door Lock + Brake
54	Down Service Arrow
55	Up Service Arrow
200+i	Maximum Start Counter
	The car is staying in rest at i th floor

PROGRAM 55...57 : In CX lift control system only 16 inputs are constant. You cannot redefine or change the terminal of the following inputs 120, 130, 140, 870, 817, 818, 500, 501, 869, M0, MK, 804, K20, FKK, DTS and CNT. All other inputs must be programmed by the user according to the needs of the system. Any input can be selected from the available inputs in the list below and can be connected to the desired terminal. The following list gives the input codes and their explanations.

PROGRAM NO	CODE	BOARD NAME
55	I0	CXK
56	I1	RLE
57	I2	RLE

PARAMETER VALUE	INPUT CODE	DEFINITION
1	FIRE	Fire
2	805	Full Load
3	802	Minimum Load
4	WTM	Waitman
5	RUN	VVVF Frequency Control
6	FOT	Photocell Input
7	SIF	Simulation Inputs
8	SIS	(Slow/Fast)
9	DER	VVVF Device Error

PROGRAM 58 : This program stores the stops (0...7) at which the second door (Door B) in the car is active. Set this parameter as program 44.

PROGRAM 59: This program stores the stops (8...15) at which the second door (Door B) in the car is active. Set this parameter as program 45.

PROGRAM 60 : Maximum time period (20.0 - 99.9 sec) in which motor is allowed to work continuously. (To set this parameter more than 450 (45 sec) is not conformity with EN81 standards. The data is displayed in seconds and can be adjusted in 0.1 second steps.

PROGRAM 61 : Delay period (0.0 - 11.0 sec) to allow the direction to change after stopping. The data is displayed in seconds and can be adjusted in 0.1 second steps.

PROGRAM 62 : This parameter stores the time period (0.0 - 3.5 sec) necessary for the automatic door to open after reaching the floor. The data is displayed in seconds and can be adjusted in 0.1 second steps.

PROGRAM 63 : If there is no signal input to the programmable input with code 5 (RUN) within the time period specified in this parameter (0.0 - 10.0 sec) after a motion command is received then the system is stopped and report error 247. If RUN input is not defined then this timer is not active. The data is displayed in seconds and can be adjusted in 0.1 second steps.

PROGRAM 64 : Brake delay (0.0 - 5.0 sec) in ACVV and VVVF systems. The data is displayed in seconds. You can adjust it in 0.1 seconds. This parameter defines the time delay for programmable relays for selection number 21-25-27.

PROGRAM 65 : Use for hall calls setting.

- 0 Hall calls are allowed
- 1 Hall calls are inhibited

PROGRAM 66 : This program defines the inspection input contact type.

- 0 Closed contact in inspection mode
- 1 Open contact in inspection mode

PROGRAM 67 : This program defines the inspection speed.

- 0 Inspection speed is the slow speed in the system.
- 2 When there is a motion command in inspection mode then only direction command is sent, neither slow nor high speed is activated.

PROGRAM 68 : This program defines the call register cancelling or not in stop failure during motion.

- 0 System continues to work
- 1 All of the call registers are cleared and the system continues to work.

PROGRAM 69-70: This program defines the functions of SWPOR boards added to the system.

- 0 Not used
- 1 Floor indicator lamps
- 2 Gray code output of car position
- 3 Binary code output of car position

CX SERIES ERROR CODES

CODE	EXPLANATION	SUGGESTIONS
120	This code is reported when the stop circuit is broken during motion	Check 110...120 safety circuit contacts, (car, car top. stop, parachute contact. Speed regulator. Pit switch, Limit switch
130	This code is reported when the door contact circuit is broken during motion.	Check landing door contact in semi-automatic door and cabin door contact in full automatic door.
135	Door could not be opened. This shows that after giving Open Door command door contact circuit was not broken.	Door lock circuit may be shorted. Check n40 parameter.
140	Door lock cannot be sensed as closed after cam or door close signal is applied.	Check n26 parameter setting. It must be set right for door dimensions. And be sure that close door signal (DCM and CLS) is ready, retire cam is active and connection of 140 terminal is OK.
141	This code is reported when door lock circuit is broken during motion.	Check cable of 140, no touch in retire cam and lock during Motion, no cut of close door signal during motion and no voltage reduction in safety circuit voltage.
225	This code is reported when the parking floor (program 25) is greater than maximum number of stops (program 21).	Check n25 parking floor parameter. (NOT more than n21)
226	This code is reported when the fire- floor (program 31) is greater than maximum number of stops (program 21).	Check n31 fire floor (NOT more than n21)
241	This code is reported when KSR1 and KSR2 are open at the same time. This error is also reported when stop circuit is open.	Check connections of high speed switches 817(KSR1)-818(KSR2), place of magnets and magnetic switches. (See CX Counter Schematics)
247	No motion detected in defined time.	Check the value in n63. Be sure that the RUN input in inputs menu is defined. If RUN is not used, n63 must be 0.
249	This code is reported when no change in floor number is detected in the time interval defined in program 32 or 39, when the car is in motion. This error may be caused by any mechanical or electrical fault, which inhibits motion, as well as any fault in floor detecting system. Be aware that any number in program 32 or 39, which are very small, can also cause this error.	<ul style="list-style-type: none"> • Check bi-stable magnetic switches, place of magnets and connections of it. • Check mechanic and rope systems, the values in n32 and n39. (Must be set according to lift speed and the highest floor distance). • Be sure that contactors are active, connections of motor are OK and brake is energized and released.
444	Maximum motor motion period is exceeded.	Check n60 parameter. Be sure that it is set according to speed of lift and height of well. Be sure that motor is in motion and speed is OK.
555	Although there are no contactors activated and the door is open, there is no signal in CONT terminal of CXA board	Check NC contacts of contactors. Be sure that none of contactor is energized. Check CONT input terminal connection on CXK board..
720	Phase Protection Relay (FKK) is out of circuit. Check the Thermistor (T2-T1) circuit and phases.	Check Thermistor (T2-T1) circuit, phase order, phase balance, voltage levels.
817	Bottom KSR error. Bottom limit is cut when car moves down at high speed.	Check 817 (KSR1) switch, cables and place of magnets. See CX Counter System Connection Diagram.
818	Top KSR error. Too limit is cut when car moves up at high speed.	Check 818 (KSR2) switch, cables and place of magnets. See CX Counter System Connection Diagram.
904	Motion control device reports error	Be sure that the error contact of speed device connection is OK. You can fix the error on display by the help of user manual.

CX HAND TERMINAL

CX hand terminal is an optional system with LCD for parameter monitoring and setting. With 6 buttons and 4x20 LCD, it is easy way to setting parameters.

A) LCD SCREEN AND KEYPAD USAGE

HTT board has LCD screen with 4-rows and 20-characters per line 6-key keypad.

Keys are located as below:

←	↑	→
ESC	↓	ENT

Functions of the keys differ in different menus. But generally, ESC is used to exit current menu; ENT is used to enter a menu and confirm any input; up and down arrows are used to move in menu lists and change value of a variant; left and right arrows are used to move left and right while changing the value of variant.

MAIN SCREEN

[SDL] [→←] [→]
.....

[01=] [INS] STOP

The main screen shows the most important lift parameters briefly at one look.

Safety Circuit

S...Stop(120)

D...Door Contact(130)

L...Door Lock(140)

Cabin door A is closed or closing

Cabin door B is closed or closing

Calls

[SDL] [→←] [→←]

...-... ..

Error code blinks

* ERROR NO:140*

Direction

[↑01=] [t02] FAST

Current Floor

Target Floor

Car Speed

Car is exactly at floor level

TOP ROW:

[S] : Stop circuit is closed.

[SD] : Stop and Door Contact circuits are closed.

[SDL] : Stop, Door Contact and Door Lock circuits are closed.

[↔] : Door is opening. (CAM is active)

[→←] : Door is closing. (CAM is inactive)

MID-ROWS (2,3):

Row 2 and 3 shows Call Registers. Most left character of row 2 shows the calls for bottom floor. As moving right, floor number increases. One character is used for each floor. The meanings of symbols are explained below:

- : No Call for this floor
- : Cabin Call for this floor
- ▲ : Up Call for this floor
- ▼ : Down Call for this floor

In a floor 1, 2 or 3 of these symbols can appear together at the same character (except). In these rows only defined floor number of characters can be seen.

BOTTOM ROW:

Columns [2, 3, 4, 5] : This group shows information about car's floor and moving direction.

[05=] : Car is exactly at floor 5. (Car is exactly at floor level)

[05] : Car is at floor 5. (Car is between floors)

[↑05] : Lift has a target on up direction.

[↓05] : Lift has a target on down direction.

Columns [8, 9, 10] : This group shows information about car's target and lift's run mode.

[INS] : Lift is in INSPECTION mode.

[t__] : Lift has no target.

[t03] : Lift has a target of Floor 3.

Columns 12, 13, 14, 15, 16 : This group shows information about car's motion and speed.

STOP : Car is stopping.

START : Car is stopping but about to move. Lift is preparing conditions for moving. (Closing door)

SLOW : Car is moving at slow speed.

FAST : Car is moving at fast speed.

HIGH : Car is moving at high speed. (over 1m/s)

B) MONITORING OF INPUTS

i) GENERAL SCREENS

On the main screen only very important variables are shown. When you press (←) button in main screen then you will face the following screen:

120*	817*	804	MO_*
130*	818*	FOT	ML_
140	FKK*	DTS	MK_*
870	CNT*	K20	869

In this section we can monitor all of the inputs. More information about inputs are in 'OUTPUT TERMINALS AND THE MEANINGS OF THE ABBREVIATIONS'. You can see number of codes with three characters with a '*' just after some of them. These codes represent an input and they are listed below in a table. The inputs which have a '*' on the right hand side are active at the moment where the others are not active. For example on the screen we see that 120 and 130 are closed where 140 (door locks) are open.

All of the inputs in the system are summarized in two screens. To switch to the second screen you can use (↑) button. Second input screen is shown below.

RUN	500
805	501
802	FIR
WIM	DER

To return back to the previous screen, (↓) button is available.

ii) GIVING CALLS FROM KEYPAD

In hand terminal it is possible to give any call (up, down or cabin) by using keypad when lift is not in inspection mode.

Here is an example.

[SDL] [→←] [→←]
.....

[01=] [t__] STOP

On Main Screen push (→)

Cabin Button

Floor No.. ?000002

In this screen you can change floor number by arrow keys and when you push ENT a cabin call is given.

On Main Screen you can give up and down call in the same way by pushing (↑) and (↓) buttons respectively.

C) MAIN MENU

If you push ENT button on Main Screen you see the following Main Menu screen.

```
> M1-PARAMETERS
  M2-ERROR LIST
  M3-LiSAN/LANGUAGE
  M4-READ PARAMETERS
```

We will see this kind of menus lots of times. The '>' (Pointer) character on most left column points a sub menu and if you want to enter pointed menu you must push ENT button. You can move '>' by using (↑) and (↓) up and down respectively.

This menu has 5 sub-menus. In the first screen above you see only 4 of them. To see others, use (↓) button. By this way cursor moves one row down at each push. If you push (↓) button when the cursor at bottom row, all lines moves one upper, the top line disappear and a new line comes from down as below:

```
> M2-ERROR LIST
  M3-LiSAN/LANGUAGE
  M4-READ PARAMETERS
  M5-WRITE PARAMETERS
```

Instead of moving one step at each time you can use (→) button to see next 4 items and (←) button to see previous 4 items.

D) SETTING PARAMETERS

System must be in inspection mode for parameter setting!

To see or change any parameter you must enter M1-PARAMETERS menu.

For example let's set the parameter 'Number of Stops in System'. **At first take the lift in inspection mode.**

```
> M1-PARAMETERS
  M2-ERROR LIST
  M3-LiSAN/LANGUAGE
  M4-READ PARAMETERS
```

In Main Menu screen, use (↑) and (↓) buttons and when the pointer points 'M1-PARAMETERS' as above, push ENT button.

```
>00-00.FLR      DISPL:  0
  01-01.FLR      DISPL:  1
  02-02.FLR      DISPL:  2
  03-03.FLR      DISPL:  3
```

To change the parameter 21-NUMBER OF STOPS push ENT again.

```
n21-NUMBER OF STOPS
```

```
?000008
```

Now, you see general parameter change screen. In this type of screens you always see 6 digit numbers. When you first enter this screen, cursor is always located under left most digit. You can increase or decrease value of the digit under which cursor is located, by using (↑), (↓) buttons respectively. You can move cursor left and right by using (→), (←) buttons.

In this screen stored parameter data is 8 and cursor is located under digit (8). Now let's see some example about how to change value of a parameter.

```
?000008
```

```
(↓ )
```

```
?000007
```

```
(↓ )
```

```
?000006
```

```
(↓ )
```

```
?000005
```

```
(← )
```

```
?000005
```

```
(↑ )
```

```
?000015
```

After setting the parameter, if you push ENT the new value on screen is saved. But if you push ESC changes are cancelled. In both cases you turn previous screen and you see value of parameter.

Here we push ENT and see the following screen.

```
>21-NUM.OF STOPS: 15
  22-COMMAND      :1
  23-LIFT TYPE    :1
  24-DOOR TYPE    :0
```

So we have changed number of floor in system as 15 and this change is saved and stored in memory.

E) ERROR LOG AND ERROR CODES

In CX Series Control System all determined errors are reported at runtime on main screen and stored in permanent memory. Error storing capacity of system is limited by 128. If an error occurs when there are already 128 errors in memory, then oldest error is cleaned and the new one is stored. You can see the stored last 128 error anytime by using LCD screen or computer connection. Here we will see how to see error list reports by using keypad and LCD.

On main menu enter M2-ERROR LIST sub-menu.

```
M1-PARAMETERS
>M2-ERROR LIST
M3-LiSAN/LANGUAGE
M4-READ PARAMETERS
```

In a few second you see the following message:

Errors are loading..

And then you see the list of stored error logs.

```
249:PASS    TIME OVERF
135:DOOR    CANNOT OPE
241:HIGH    LIMITS ARE
>140:LOCK    WAIT OVERF
```

Here error logs are sorted by date & time property. In this screen you can only see error date, time and error code. If you want to see more detailed report, select an error by using arrow keys and push ENT.

```
QUEUE NO : 4
ERROR CODE: 140
FLOOR: 8 START ↑
LOCK WAIT OVERLOAD
```

In this screen you see error turn at first line and error number at second line. At third line, floor, speed and direction of car (when error occurred) are seen. And explanation of error is written at last line.

F) LANGUAGE

Another item in main menu is M3- LiSAN/LANGUAGE

```
M1-PARAMETERS
M2-ERROR LOG
>M3-LiSAN/LANGUAGE
M4-READ PARAMETERS
```

You can change active menu language by this menu. When this manual is prepared, supported languages are Turkish, English and German. New languages will be supported near future.

G) PARAMETER TRANSFER

i) READ PARAMETERS

Another menu in main menu is M4- READ PARAMETERS.

```
M1-PARAMETERS
M2-ERROR LOG
M3-LiSAN/LANGUAGE
>M4-READ PARAMETERS
```

This parameter is for parameter transfer from CX main board to hand terminal. Place pointer to M4-READ PARAMETERS menu and when press ENT

```
READ PARAMETERS
```

```
(ESC)EXIT (↑)GO
```

screen display. Press ESC for deleting and return to main menu or press (↑) for starting.

```
READ PARAMETERS
getting parameters..
```

```
OK.
```

This message displays when parameter transfer operation from CX main board to hand terminal completed. Return main menu by ENT button.

ii) WRITE PARAMETERS

Another item in main menu is M5-WRITE PARAMETERS. This parameter is for parameter transfer from hand terminal to CX main board.

```
M2-ERROR LIST
M3-LiSAN/LANGUAGE
M4-READ PARAMETERS
>M5-WRITE PARAMETERS
```

Place pointer to M5-WRITE PARAMETERS and when press ENT button

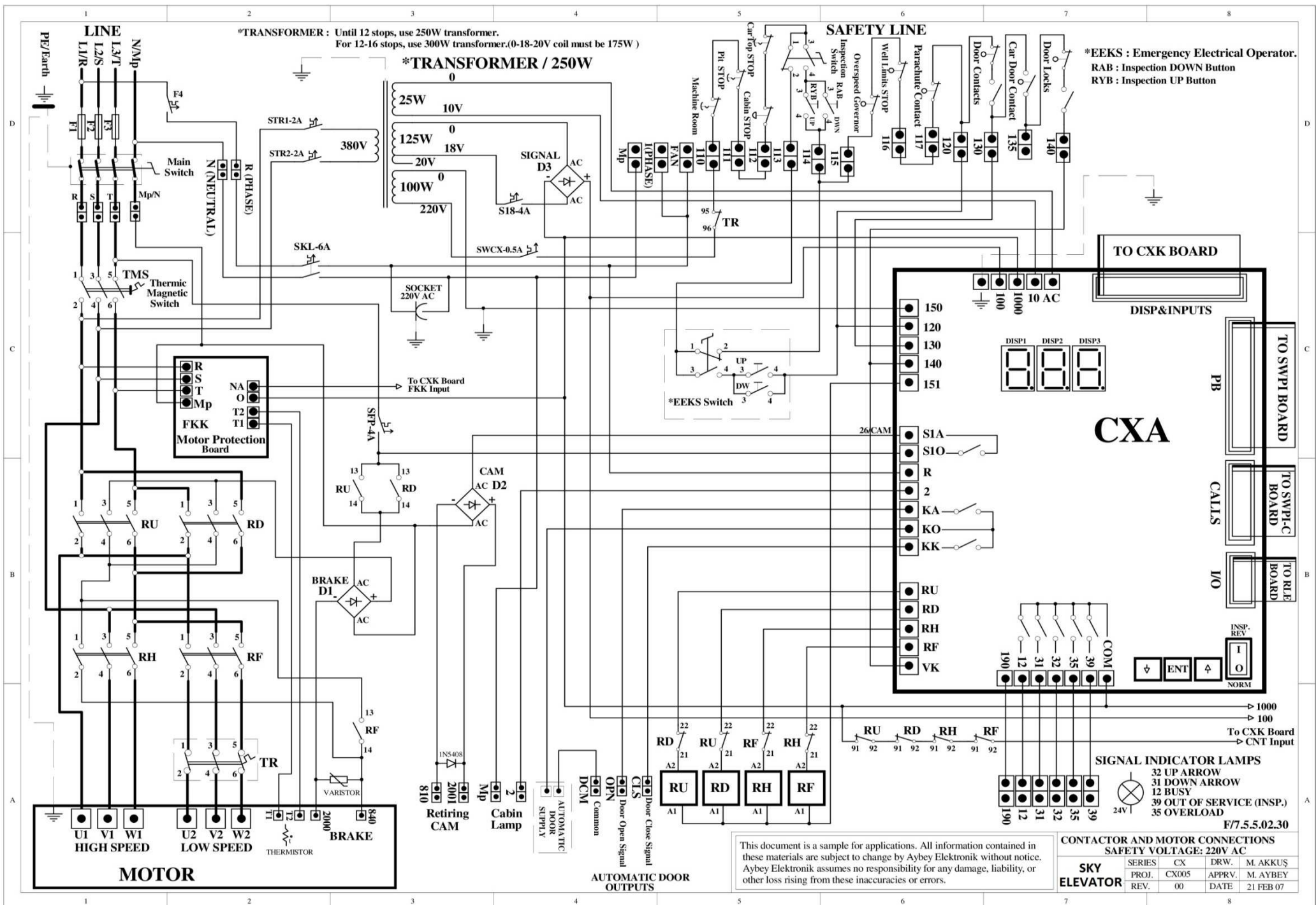
```
WRITE PARAMETERS
```

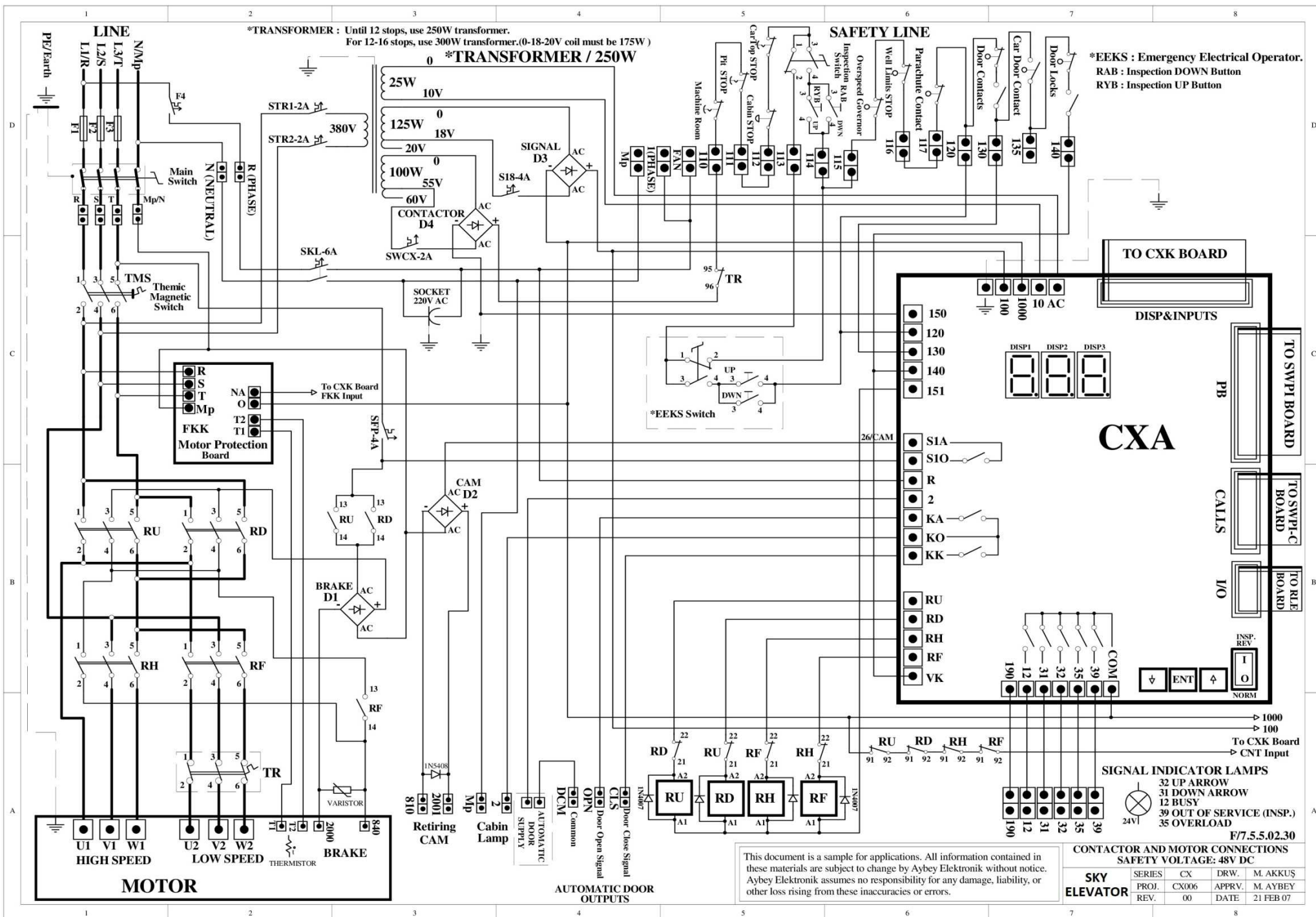
```
(ESC)EXIT (↑)GO
```

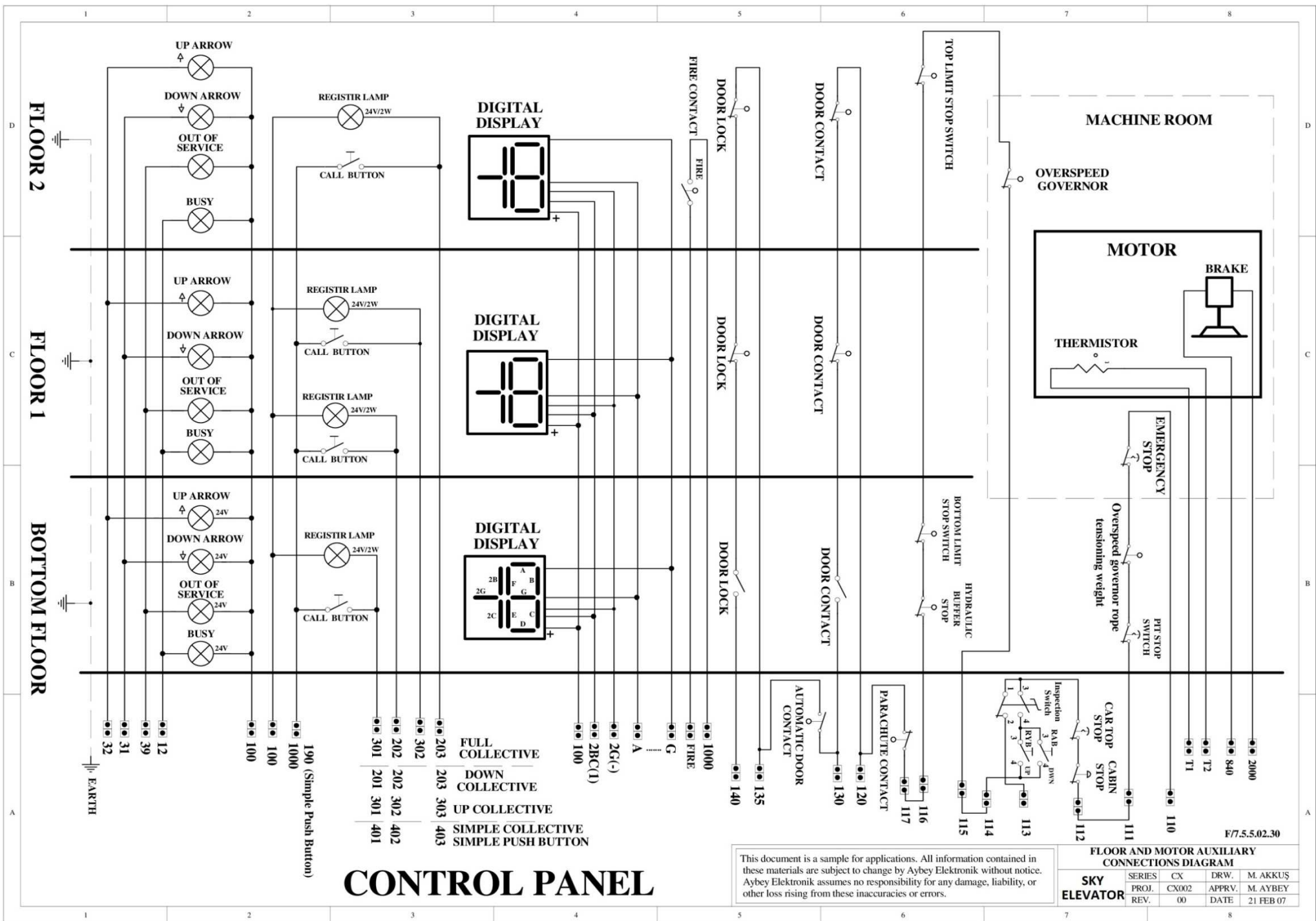
screen display. Press ESC for deleting and return to main menu or press (↑) for starting.

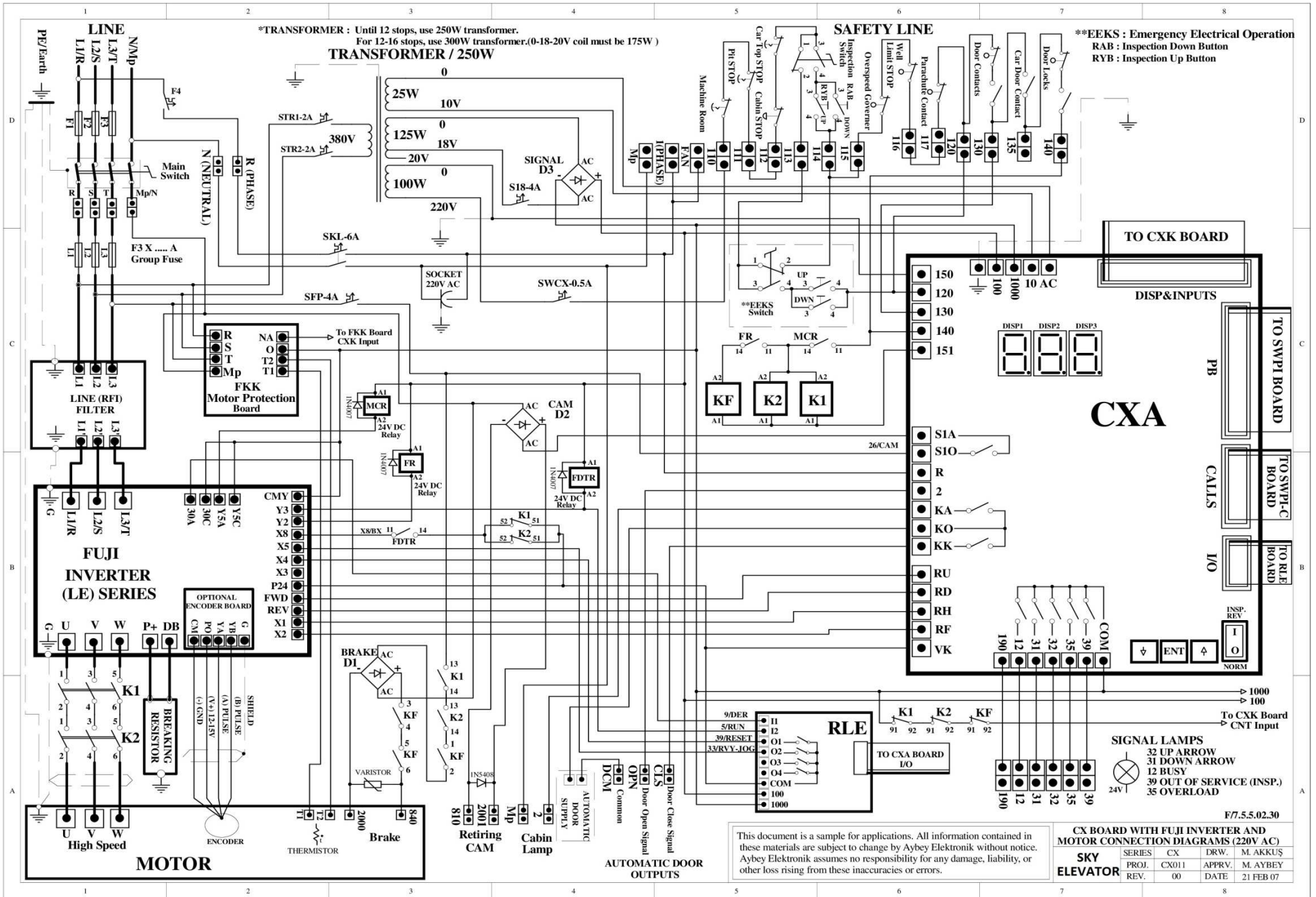
```
WRITE PARAMETERS
saving parameters.. OK.
```

This message displays when parameter transfer operation from hand terminal to CX mainboard completed.
Return main menu by ENT button

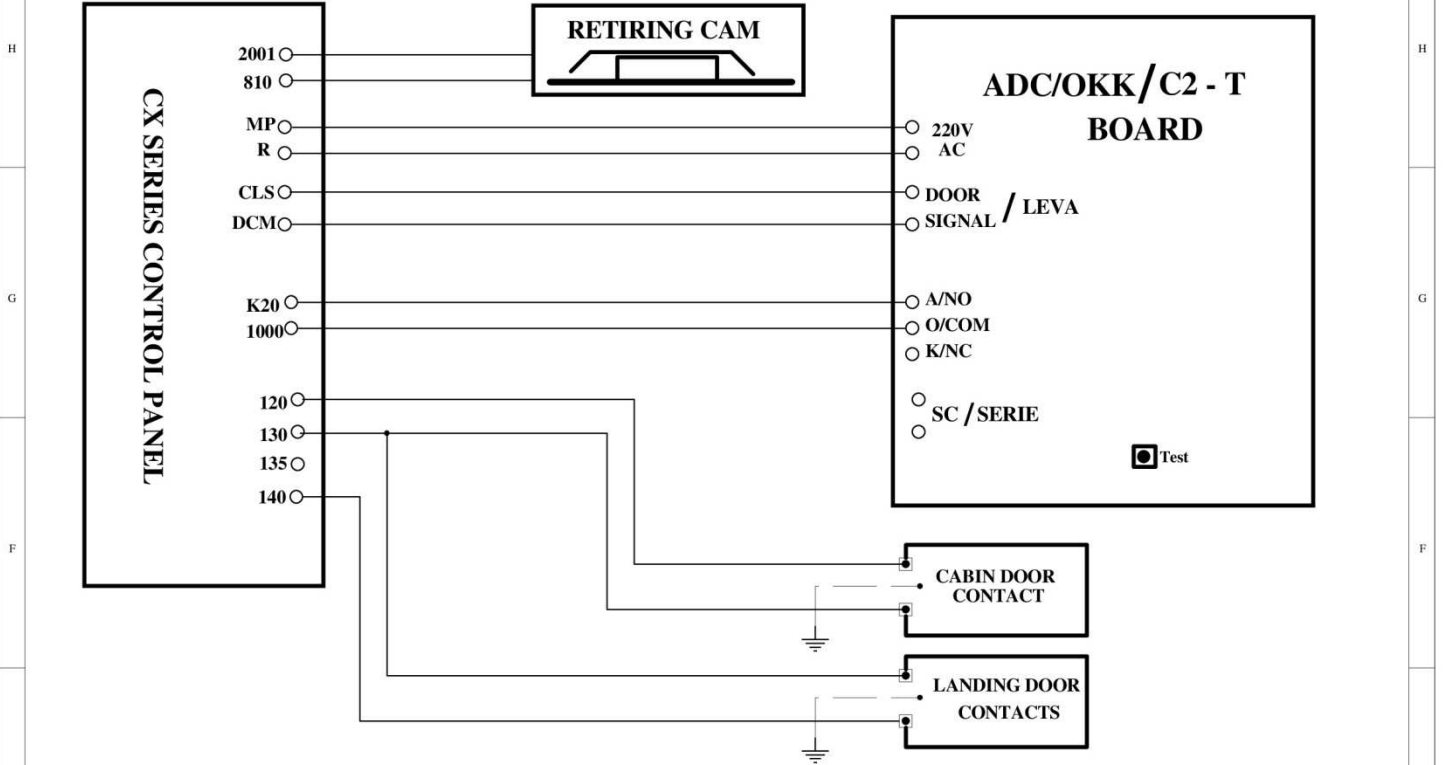




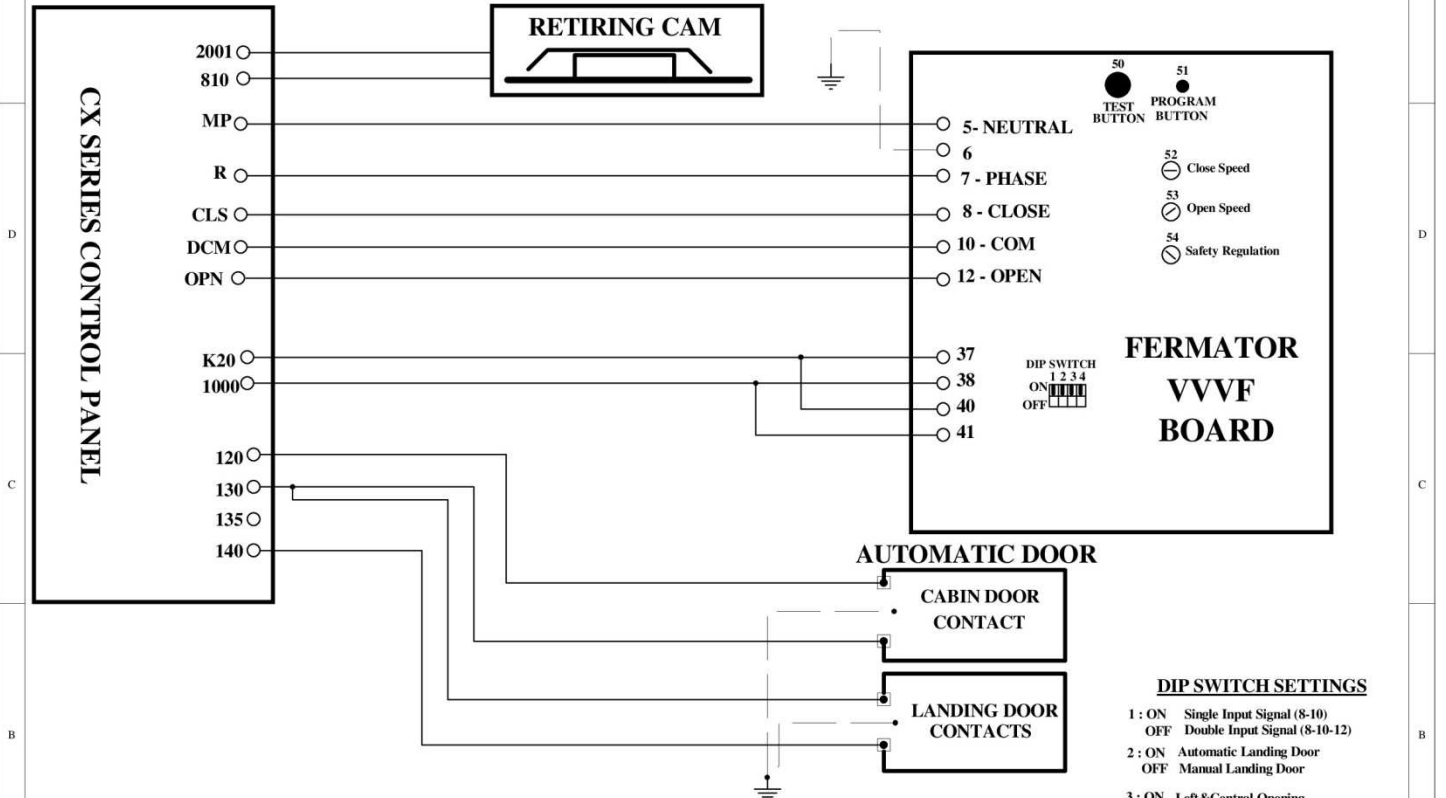




CX SERIES CONTROL PANEL AND FERMATOR 40/10 DOOR CONNECTION DIAGRAM



CX SERIES CONTROL PANEL AND VVVF BOARD CONNECTION DIAGRAM



DIP SWITCH SETTINGS

- 1 : ON Single Input Signal (8-10)
OFF Double Input Signal (8-10-12)
- 2 : ON Automatic Landing Door
OFF Manual Landing Door
- 3 : ON Left&Central Opening
OFF Right Opening
- 4 : ON Automatic Self Control (MASTER)
OFF Manual Control (SLAVE)

- 1) CAM terminals (2001-810) are not used if car and landing doors are full-automatic
- 2) If cabin door is automatic and landing doors are manual then:
Landing door contacts are serially connected to 120-130 terminals.
Car door contacts are serially connected to Car door contact (130-135) terminals.
Landing door lock contacts are serially connected to Car door contact (135-140) terminals.

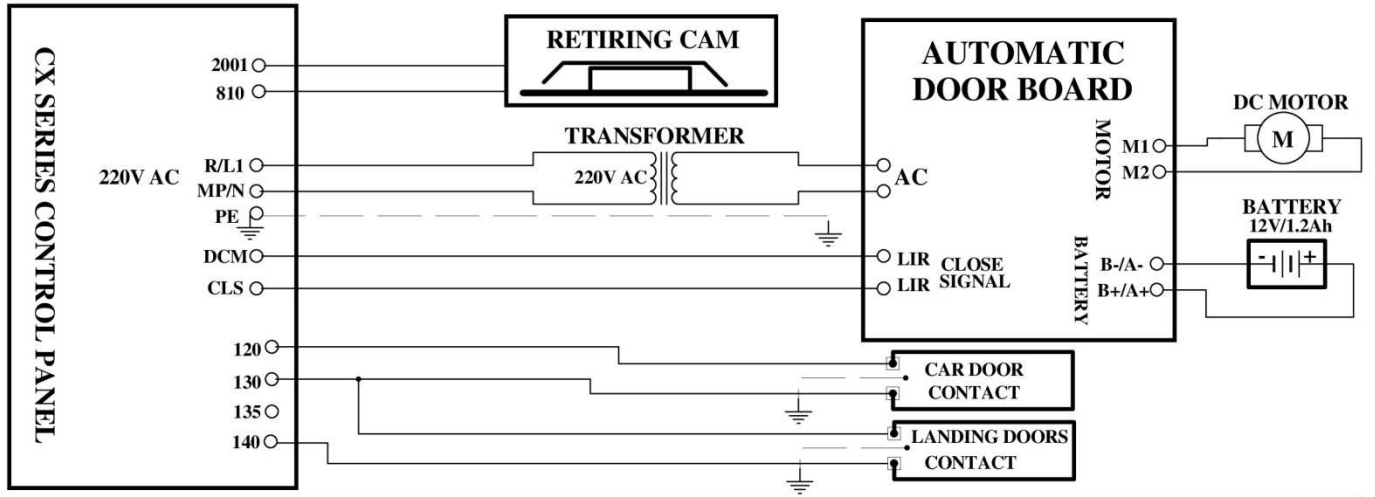
F/7.5.5.02.30

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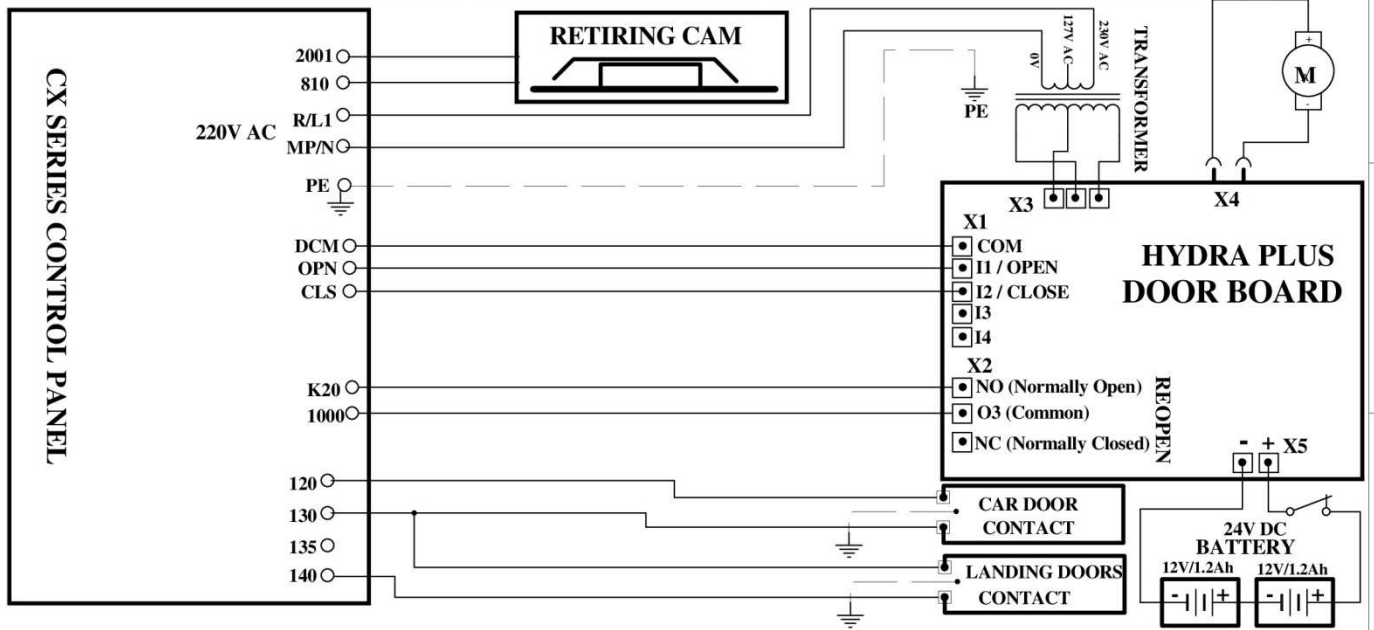
CX CONTROL PANEL AND FERMATOR DOOR CONNECTION DIAGRAM

SKY ELEVATOR	SERIES	CX	DRW.	M. AKKUŞ
	PROJ.	CX007	APPRV.	M. AYBEY
	REV.	00	DATE	21 FEB 07

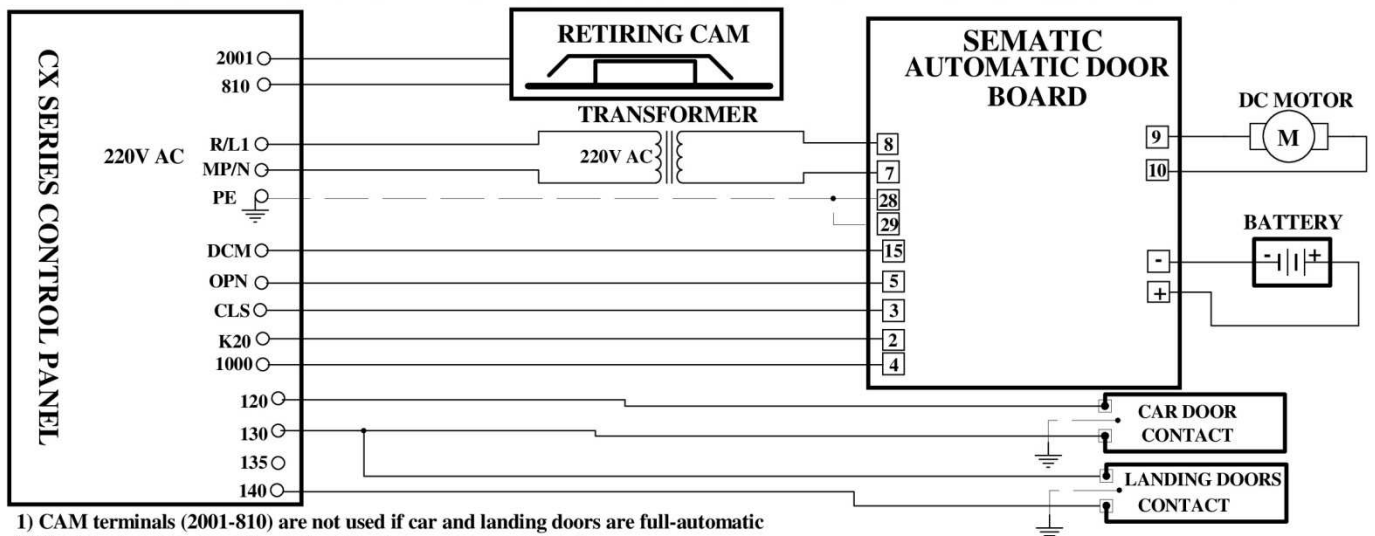
MERIH AND TROMP DOOR CONNECTION DIAGRAM FOR CX CONTROL PANEL



WITTUR HYDRA PLUS DOOR CONNECTION DIAGRAM FOR CX CONTROL PANEL



SEMATIC AUTOMATIC DOOR CONNECTION DIAGRAM FOR CX CONTROL PANEL



- 1) CAM terminals (2001-810) are not used if car and landing doors are full-automatic
- 2) If cabin door is automatic and landing doors are manual then:
 Landing door contacts are serially connected to 120-130 terminals.
 Car door contacts are serially connected to Car door contact (130-135) terminals.
 Landing door lock contacts are serially connected to Car door contact (135-140) terminals.

F/7.5.5.02.30

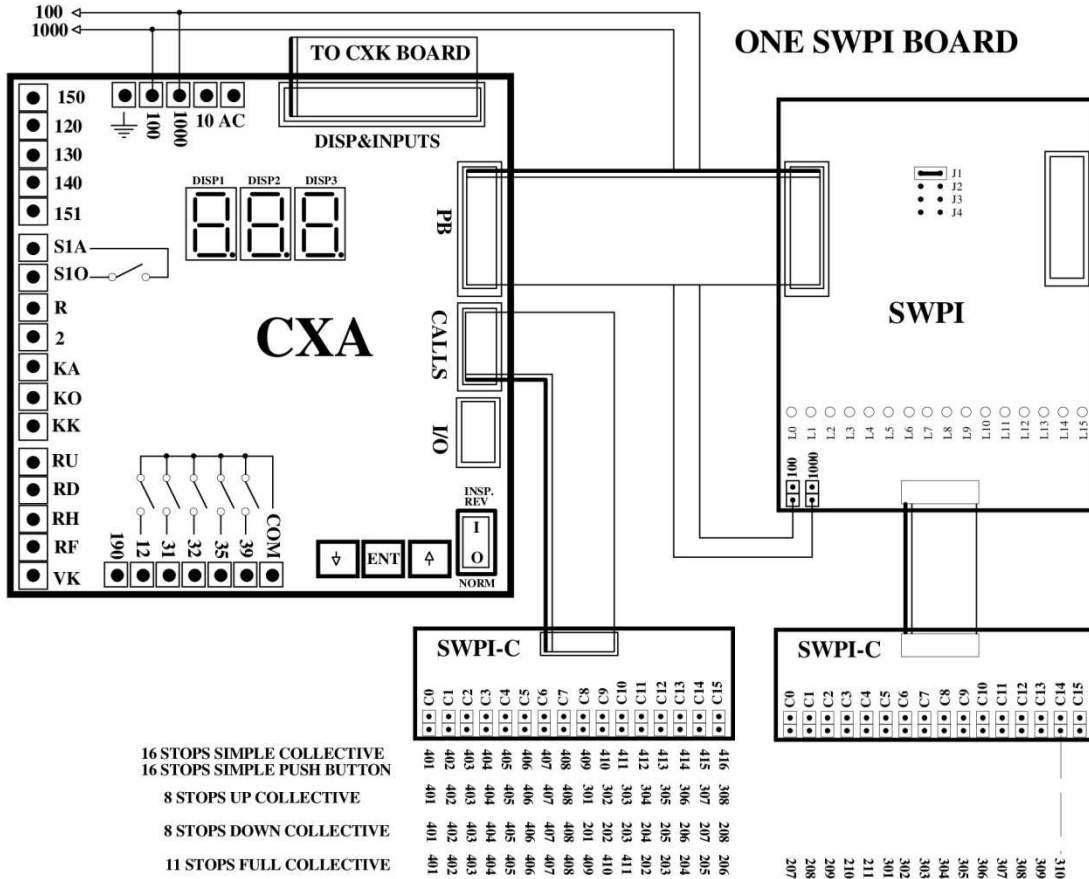
MERIH, TROMP, HYDRA PLUS AND SEMATIC
DOOR CONNECTION DIAGRAM

SKY ELEVATOR	SERIES	CX	DRW.	M. AKKUŞ
PROJ.	CX063	APPRV.	M. AYBEY	
REV.	00	DATE	21 FEB 07	

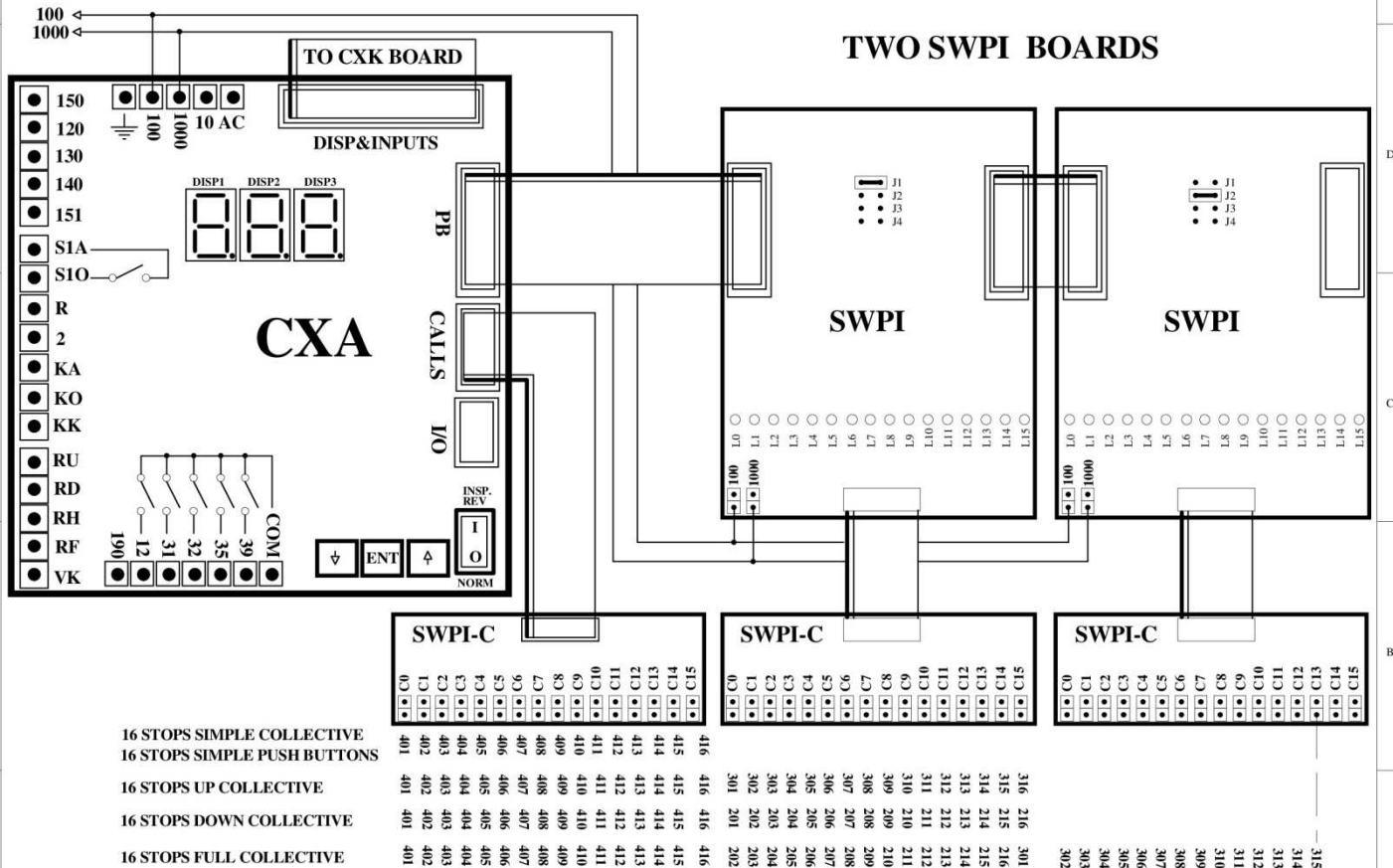
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SWPI CALL REGISTER BOARD CONFIGURATIONS

ONE SWPI BOARD



TWO SWPI BOARDS



F7.5.5.02.30

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SWPI BOARD CONFIGURATIONS AND CONNECTION DIAGRAM			
SKY ELEVATOR	SERIES	CX	DRW. M. AKKUŞ
	PROJ.	CX008	APPRV. M. AYBEY
	REV.	00	DATE 21 FEB 07