



PITAGORA III

The main title 'PITAGORA III' is rendered in a bold, black, sans-serif font. It is centered between two horizontal red lines. Above the text, a red triangle points downwards towards the word 'PITAGORA'.

Installation Notice

V 3.9



SAFETY NOTES

INSTALLATION

The control panel must be installed internally with a degree of pollution of not more than 2.
The cabinet has an IP2X degree of protection.

The controller setup and maintenance has to be made by qualified technicians after having carefully read the documentations and electrical schemes provided with the controller.

Protection toward indirect contacts has to be realized through magnetothermic and differential switches and a grounding system. Unless otherwise specified, the customer is requested to provide these protections.

Please refer to the wiring diagram supplied with the control panel for the following protection circuits:

- magnetothermic protection of the motor circuit
- magnetothermic protection of the safety circuit
- protection fuses of all other circuits

Protection measures against electric shock:



- The control panel case of the is metallic and must be grounded as indicated in the circuit diagram supplied with the control panel.
- The command and control circuits (24V) are galvanically separated from the main power supply as indicated in the wiring diagram supplied with the control panel.
- The safety circuit is galvanically separated from the main power supply as indicated in the wiring diagram supplied with the control panel.

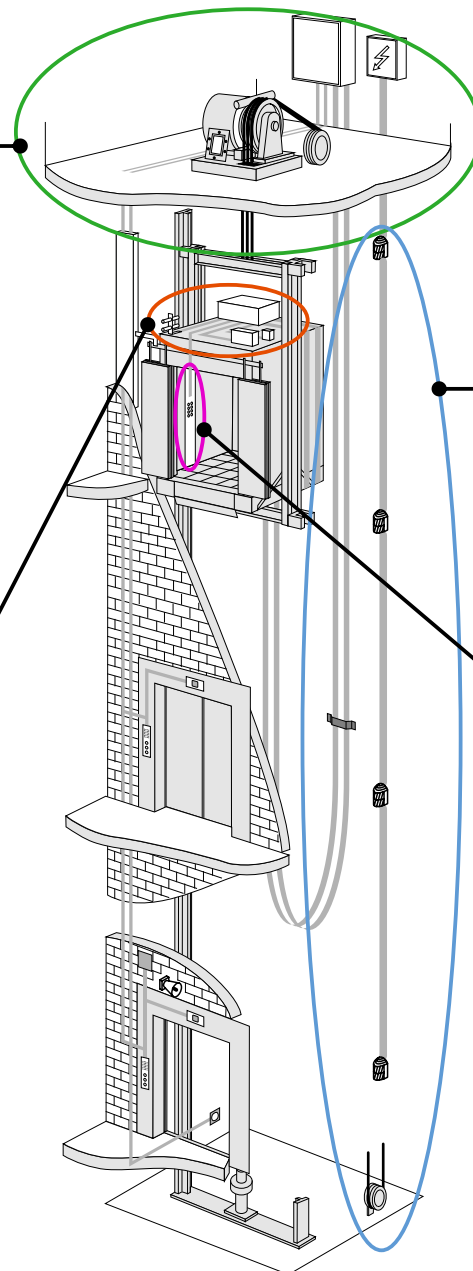
MAINTENANCE



For control panel's maintenance, please refer to the manual supplied with the control panel. During periodic inspections of the system, check the alarm circuits' battery status of the and the floor return circuit (if present).



Refer to the packaging instructions to handle and move the control panel.



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 - The information in this manual may vary without notice for any enhancements.

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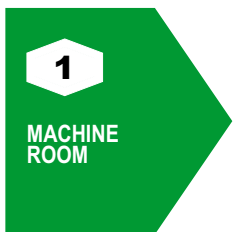
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PARTS IDENTIFICATION



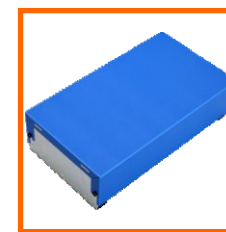
cod. **QSM.C** _____
Machine room wirings



cod. **QSM.P3PMP**
Temporary operation box



cod. **QSM.P3PME**
Emergency operation box



cod. **QTC.TOCB** _____
Standard TOC box



cod. **QTC.P3PMC**
Inspection box for TOC



cod. **QTC.P3PMC20** _____
Inspection box for TOC



cod. **QVA.P3SAP**
Prewired alarm siren



cod. **QTC.P3PSC**
Emergency stop 2nd door



cod. **QTC.P3CTOC** /2
Top of car wiring kit

cod. **QTC.P3CTMRL** /2
Top of car wiring kit MRL



cod. **QTC.LLCS2P**
Load weighing kit



cod. **QTC.P3FTC**
Door cellule kit



cod. **QVA.ENC + QVA.CORD** _____
Encoder counting kit
+ rope 60 / 120 mt.



cod. **QTC.P3FFM**
Magnetic counting kit



cod. **QTC.CAL**
Magnets for counting kit



cod. **QTC.P3FCRM**
Magnetic deceleration switches



cod. **QVA.C16P20-25-30-35-40-45-50-55-60-70-80-...-140**
20 ÷ 140 mt travelling cables

PARTS IDENTIFICATION



cod. **QVA.P3FCIA13**
Top final limit switch kit /
Bottom final limit switch kit



cod. **QVA.P3FCIA2**
Top and bottom
final limit switch kit



cod. **QVA.P3EXE**
Final limit switch kit
(traction/hyd direct)



cod. **QVA.P3STAH_FIXK**
H Supports kit



cod. **QVA.P3EXH**
Final limit switch kit
(traction/hyd indirect)



cod. **QVA.P3STAS_FIXK**
S Support kit



cod. **QTC.FFC**
Switch supports kit



cod. **QVA.P3EXMR**
Final limit switch kit MRL



cod. **QTC.P3RZP1**
Levelling and door zone kit



cod. **QTC.P3RZP2**
Door Zone kit



cod. **QVA.STAL**
Magnets/support bracket Kit
(in case of door zone)



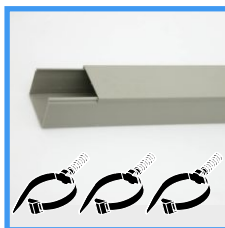
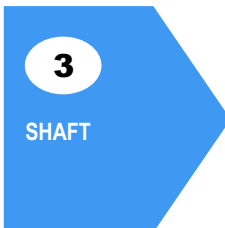
cod. **QVA.STAL2**
Magnets/support bracket Kit
(in case of relevelling)



cod. **QTC.DBP20**
Light with buzzer
for by-pass alert



cod. **QTC.LEM20**
Emergency light



cod. **QVA.CAN**
Shaft conduit



Safety chain
cod. **QVA.P3S**
cod. **QVA.P30S**_(EN81-20)



cod. **QVA.P3PSC1**
Pit stop



cod. **QVA.P3PSC2**
Stop + 220V plug for pit



cod. **QVA.P3PSC3**
Stop + 220V plug for pit
+ green indicator



cod. **QVA.PMF20**
Inspection box for PIT



cod. **QSM.DTU**
Main power switch box



cod. **QVA.LUNE**
Shaft illumination kit



cod. **C37P04**
37 poles cable for car panel



cod. **QVA.CP**
8 poles cable for hall panels



cod. **QVA.CAUX8 / 16**
Serial position indicators cable

VERSIONS

MR
Machine room



MRL
"All in one" (single floor cabinet)



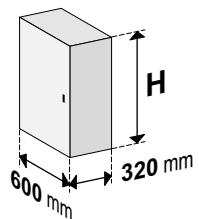
MRL
Shaft box + floor operating panel



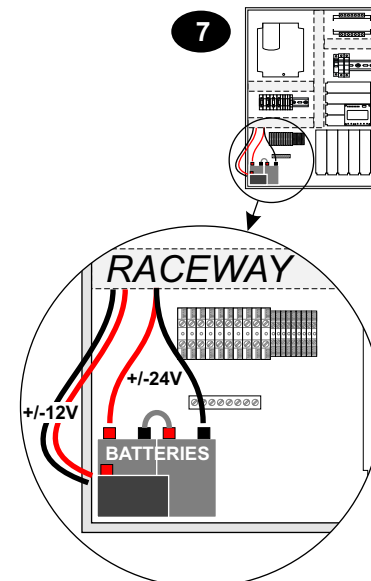
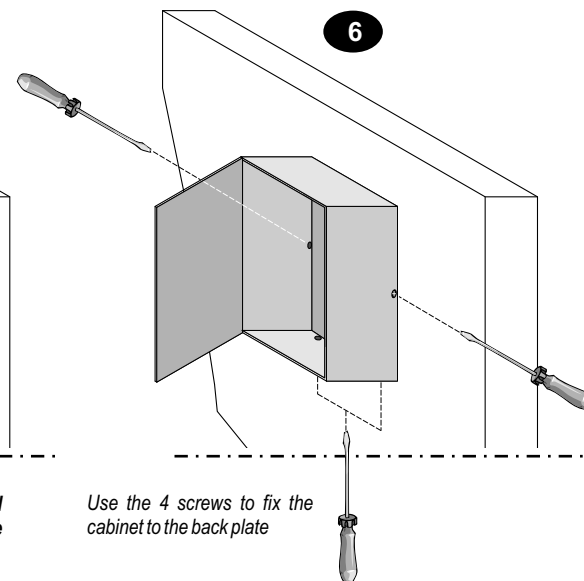
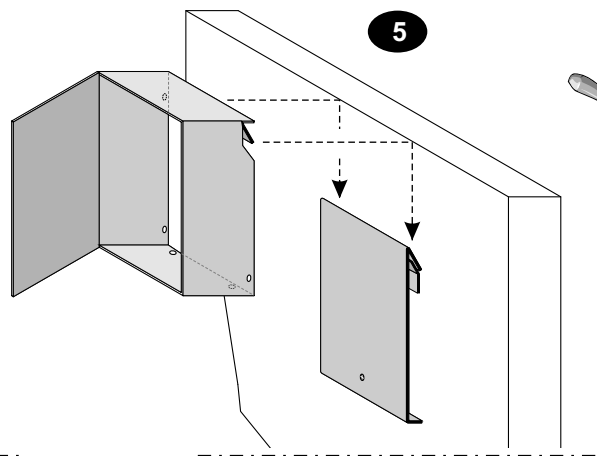
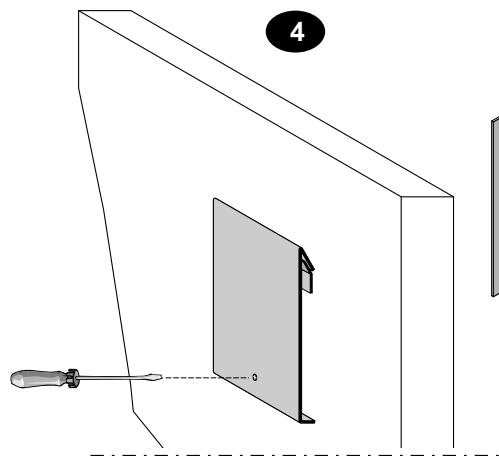
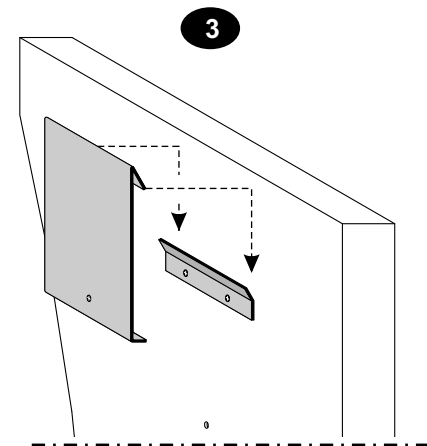
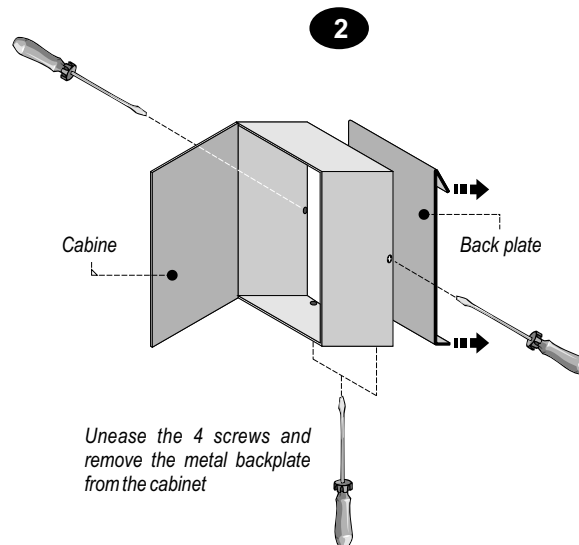
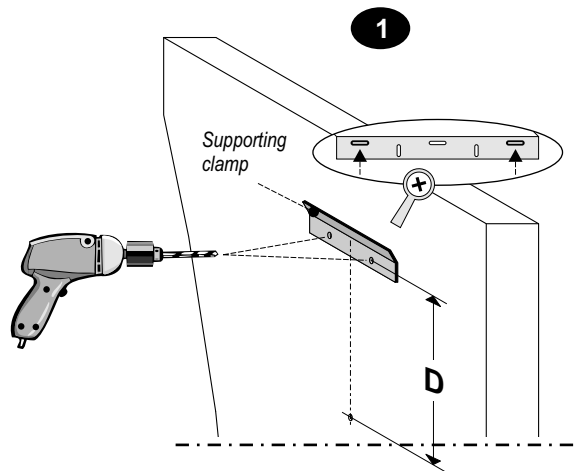
1) MACHINE ROOM

1.1) - CABINET INSTALLATION

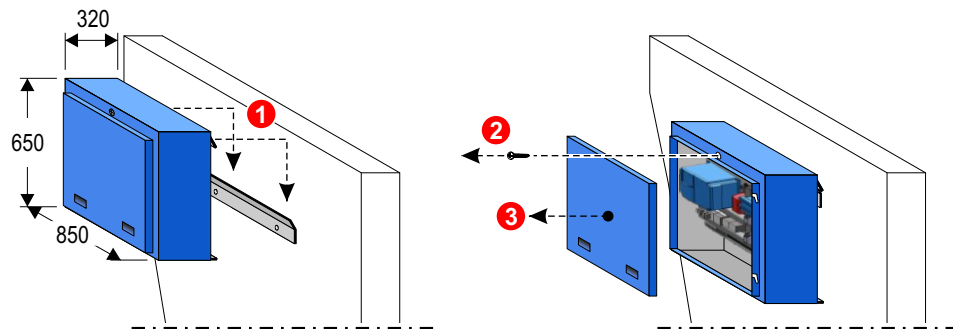
1.1.1) - MR (Machine room)



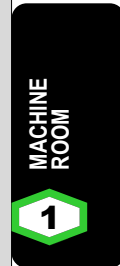
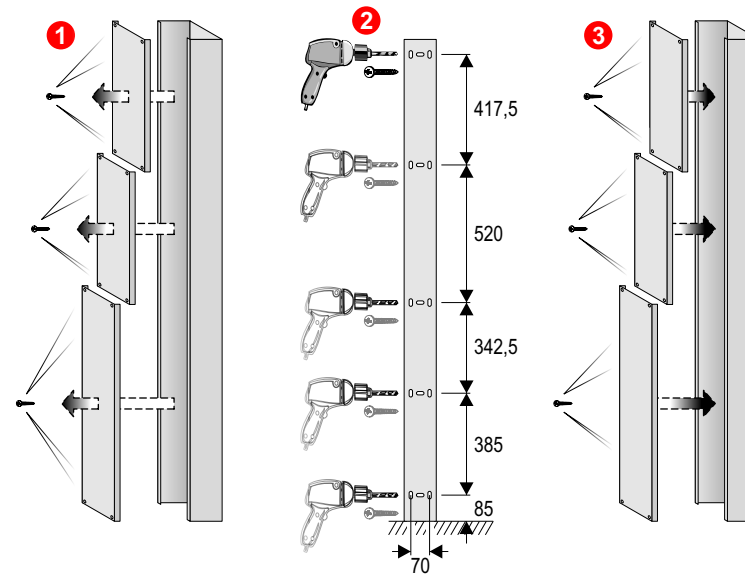
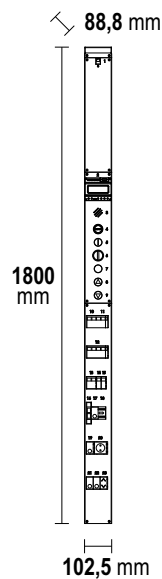
H	D
720	660
840	780
1040	985



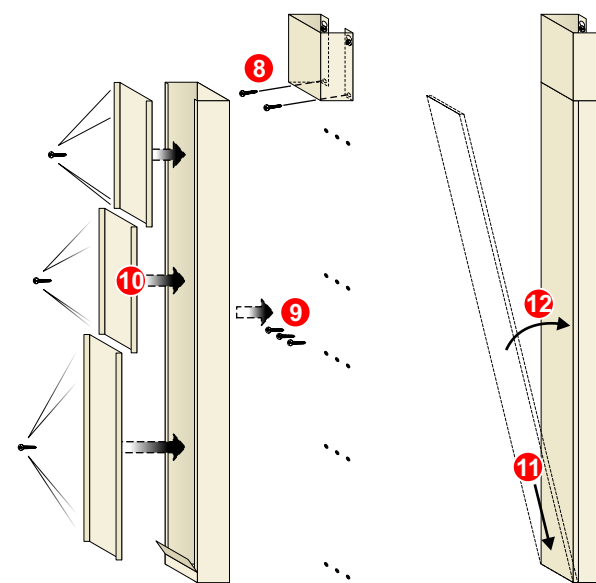
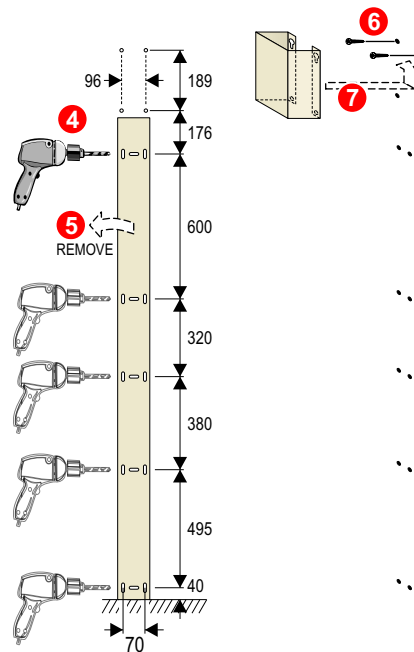
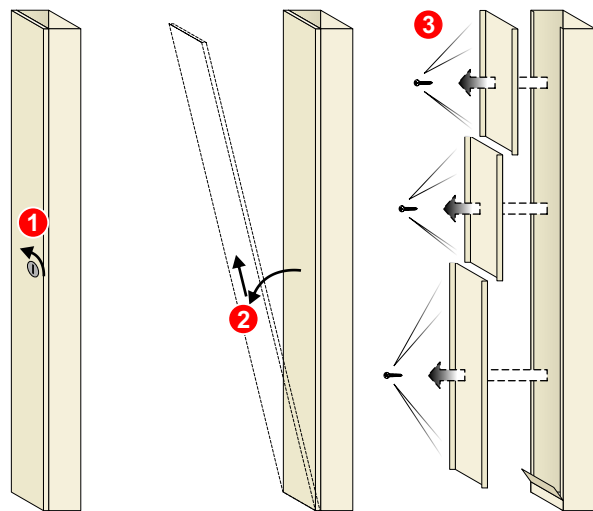
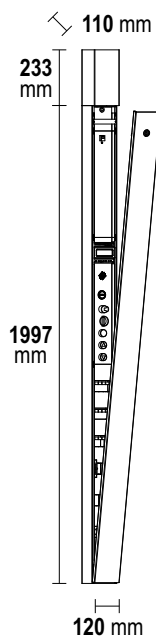
1.1.2) - MRL (Shaft box + floor operating panel)



**FLOOR OPERATING PANEL
INSIDE THE FRAME**



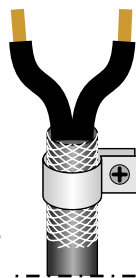
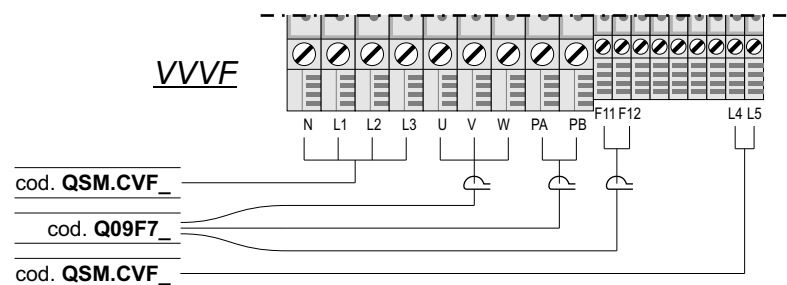
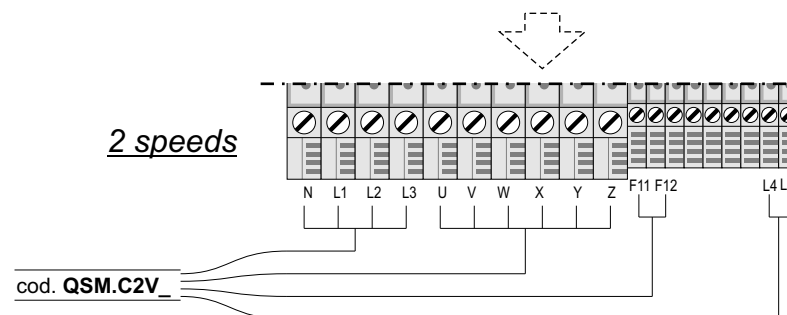
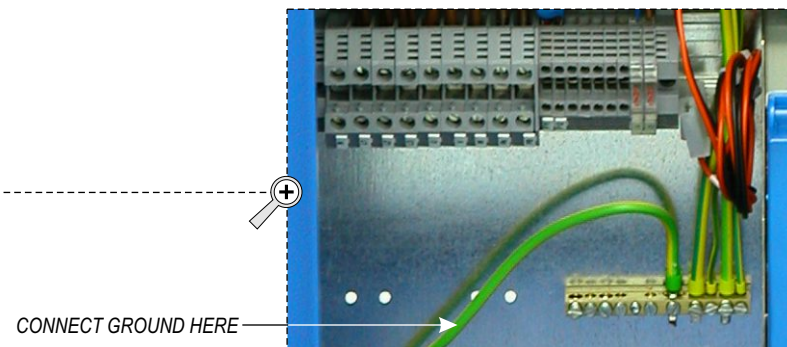
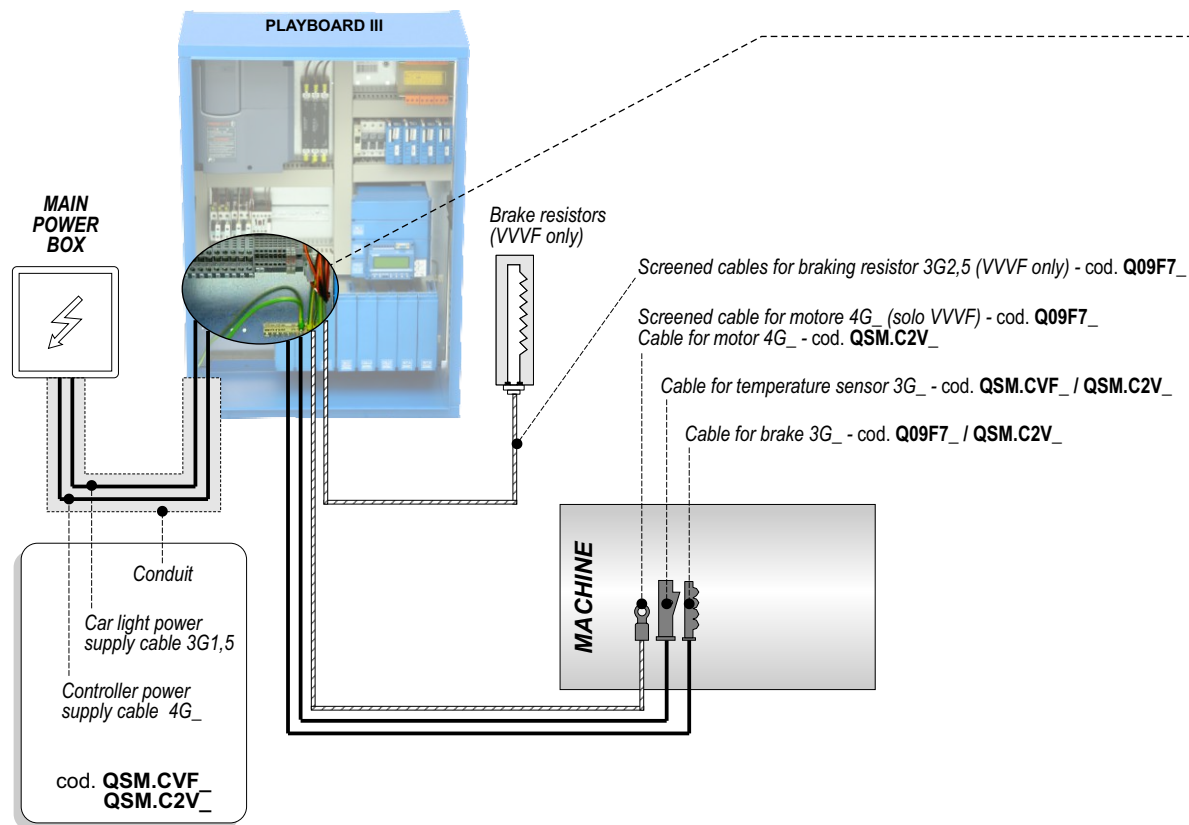
**FLOOR OPERATING PANEL
OVERLAPPED ON THE FRAME**



1.2) - CONNECTION OF THE MOTOR

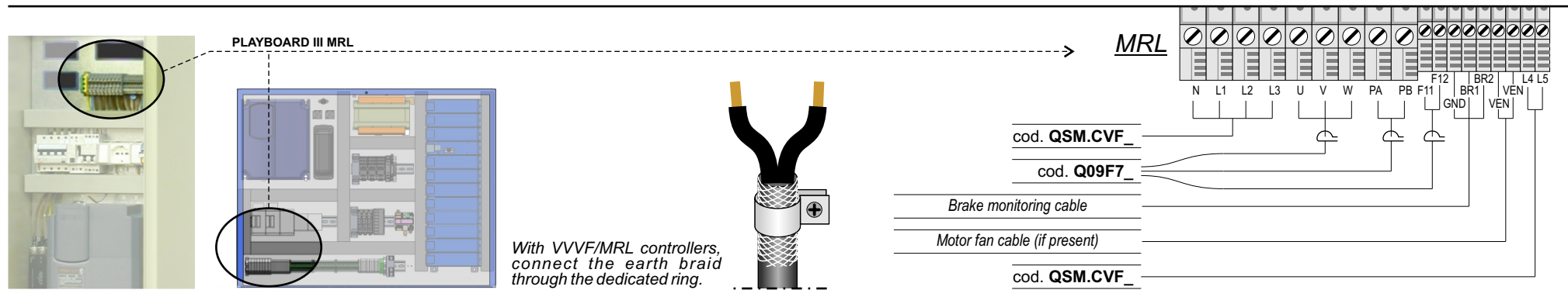
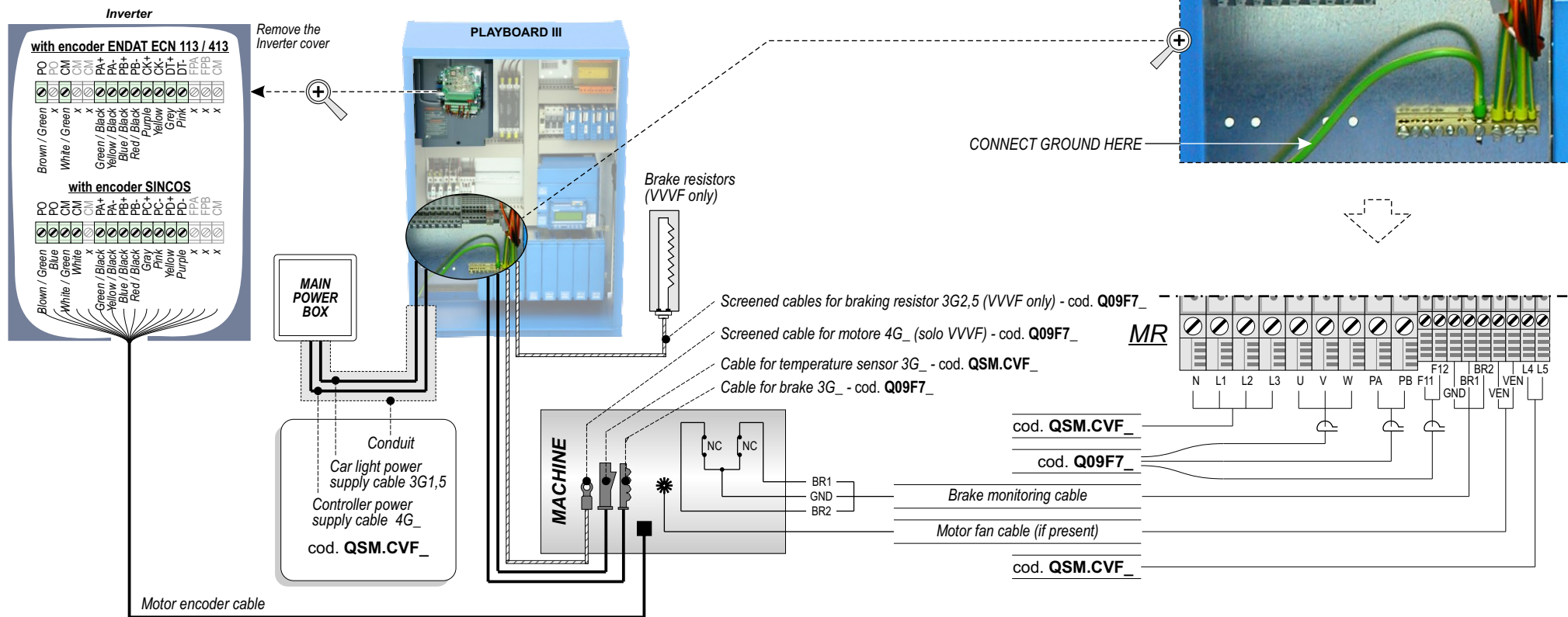
1.2.1) - TRACTION CONTROLLERS - GEARED MACHINE (ASYNCHRONOUS)

(2 speeds / VVVF)

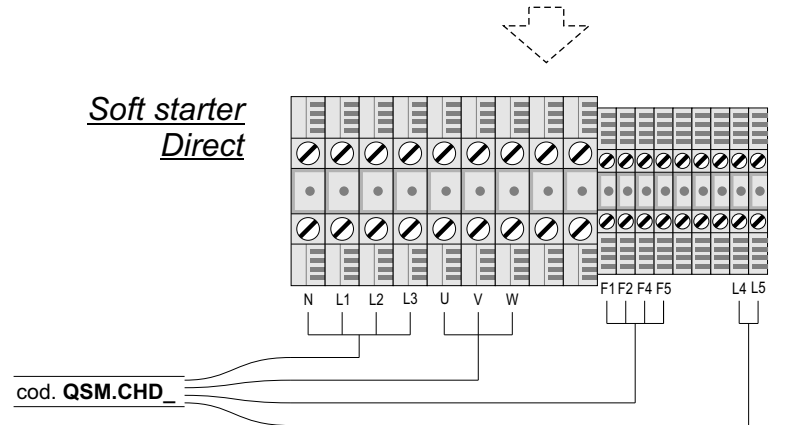
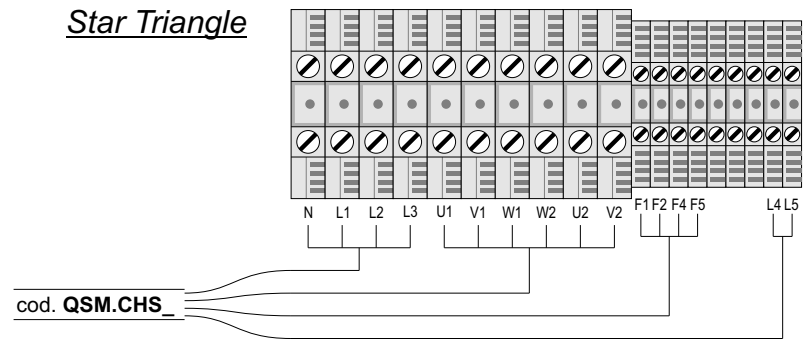
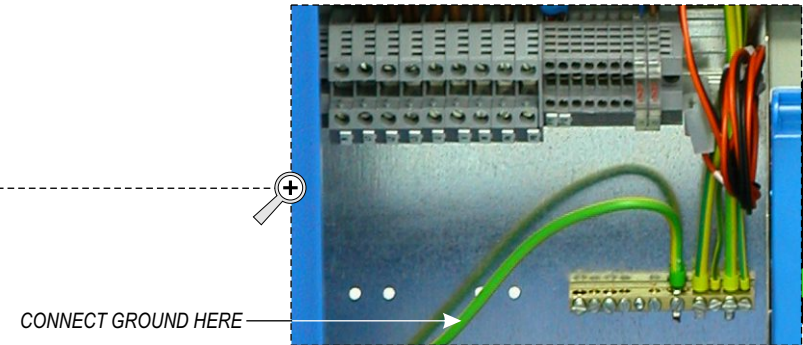
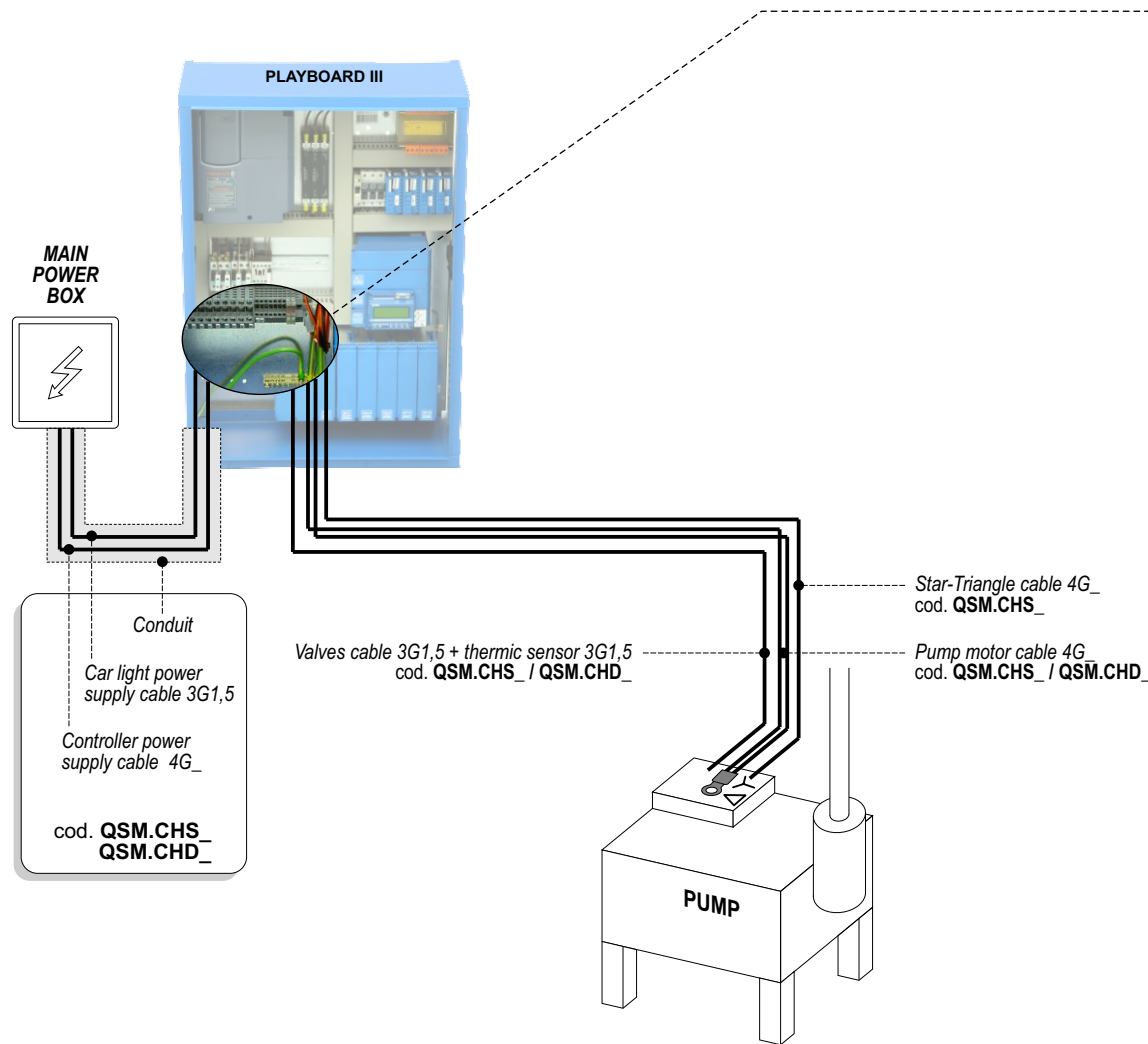


With VVVF/MRL controllers, connect the earth braid through the dedicated ring.

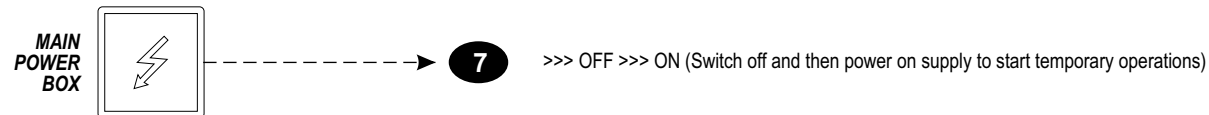
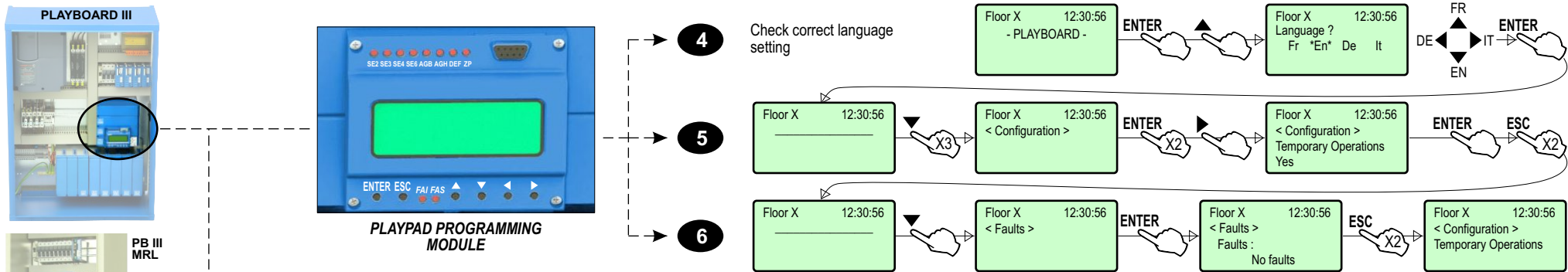
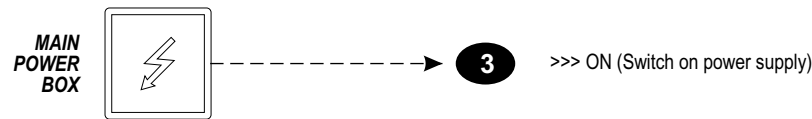
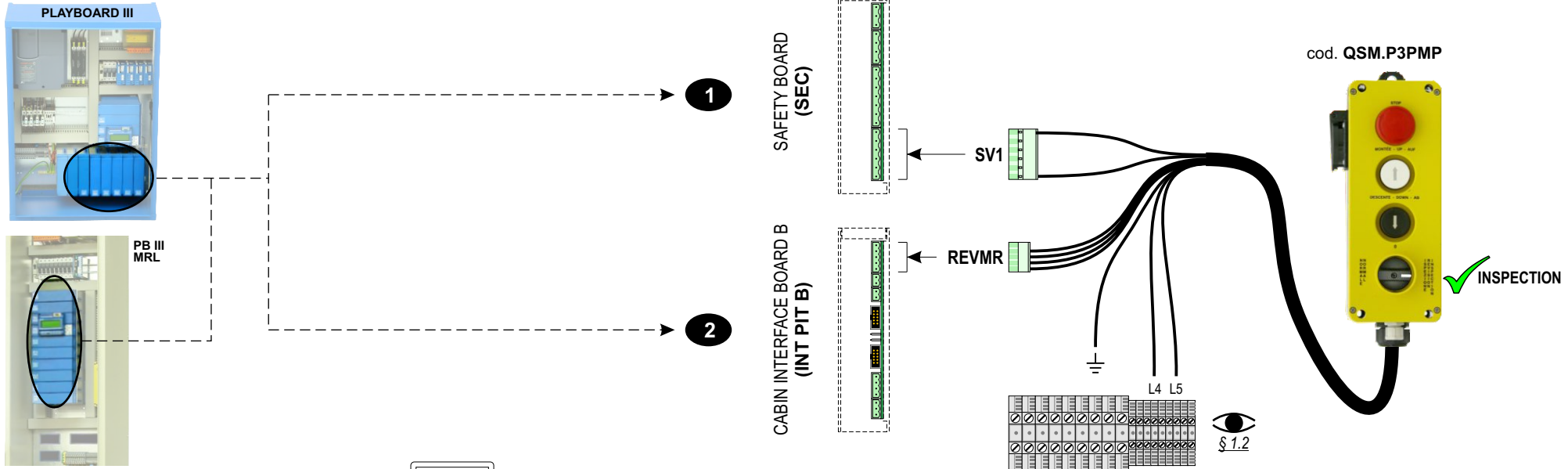
1.2.2) - TRACTION CONTROLLERS - GEARLESS MACHINE (SYNCHRONOUS)



1.2.3) - HYDRAULIC CONTROLLERS
(Star triangle / Soft starter / Direct)

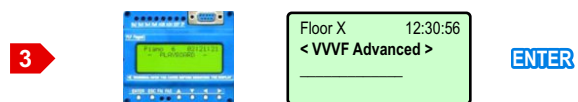
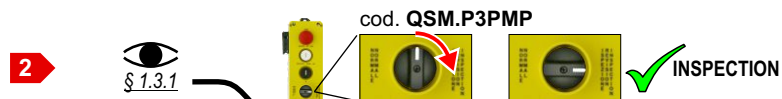


1.3) - TEMPORARY OPERATIONS
1.3.1) - CONNECTIONS AND PROGRAMMING



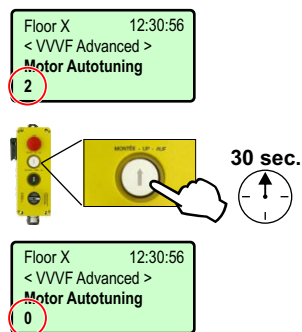
1.4) - MACHINE DATA SELF-LEARNING PROCEDURE

1.4.1) - GEARED MACHINES



- P01 - Motor Poles --->>> Enter the number of motor poles
- F03 - Maximum speed --->>> Enter the maximum motor speed
- F04 - Rated speed --->>> Enter the rated motor speed (Hz)
- F05 - Rated voltage --->>> Enter the rated motor Voltage
- L02 - PG resolution --->>> Set the motor encoder resolution (for closed loop system only)
- P03 - Motor Rated Cur --->>> Enter the rated current intensity of the machine
- P02 - Motor Rated Cap --->>> Enter the rated power of the machine
- C11 - High speed --->>> Set high speed C11 (value specified on the motor nameplate, typically 50 Hz)
- C10 - Middle speed --->>> Set inspection/intermediate speed C10 (typically 50% of C11)
- C07 - Creep speed --->>> Set low speed C07 (typically 10% of C11)

4 Select the parameter P04 "Motor Autotuning" and start the self-learning procedure by entering the value "3".







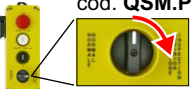

- In case something is wrong during the procedure, the error is registered in the menu "ERRORS" (i.e.: 52=er7 Error VVVF), if so, erase all errors and repeat the procedure.
- At the end of the procedure, press the UP/DOWN button and check the correct movement direction of the car; if not correct, invert values of parameters E98 and E99.
















For all details and for the fine tuning of comfort in the elevator car, please refer to the PLAYBOARD user manual.



1.4.2) - GEARLESS MACHINES

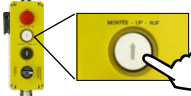

1  - PLAYBOARD III - DMG S.p.A. **ENTER** Code ? ** Password ** **ENTER**  X3 Floor X 12:30:56 < Configuration > **ENTER** X2  Floor X 12:30:56 < Configuration > Temporary operations Yes **ENTER**

2  § 1.3.1  cod. QSM.P3PMP  **INSPECTION**

3  Floor X 12:30:56 < VVVF Advanced > **ENTER**  P01 - Motor Poles --->>> Enter the number of motor poles  F03 - Maximum speed --->>> Enter the maximum motor speed  F04 - Rated speed --->>> Enter the rated motor speed (Hz)  F05 - Rated voltage --->>> Enter the rated motor Voltage  P08 - M- %X --->>> Set the value "10%"  P07 - M- %R1 --->>> Set the value "5%"  P06 - M-No-Load Curr. --->>> Set the value "0 Ampere"  P03 - Motor Rated Cur --->>> Enter the rated current intensity of the machine  P02 - Motor Rated Cap --->>> Enter the rated power of the machine  C11 - High speed --->>> Set high speed C11 (value specified on the motor nameplate, typically 50 Hz)  C10 - Middle speed --->>> Set inspection/intermediate speed C10 (typically 50% of C11)  C07 - Creep speed --->>> Set low speed C07 (typically 10% of C11)  L01 - PG select --->>> Set the motor encoder type  L02 - PG resolution --->>> Set the motor encoder resolution (for closed loop system only)

4 Select the parameter P03 "P.P. Tuning" and start the self-learning procedure by entering the value "1".

Floor X 12:30:56 < VVVF Advanced > P.P. Tuning **1**


 **15 sec.** 

Floor X 12:30:56 < VVVF Advanced > P.P. Tuning **0**

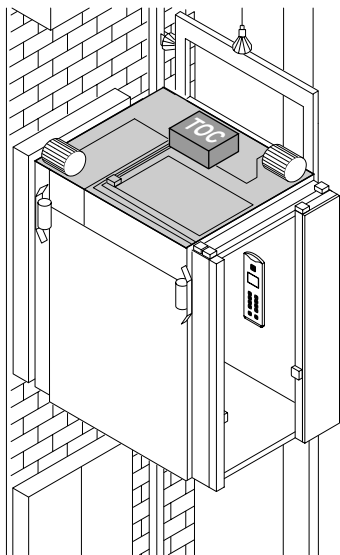
These parameters are programmed in factory, if values are provided with the order.



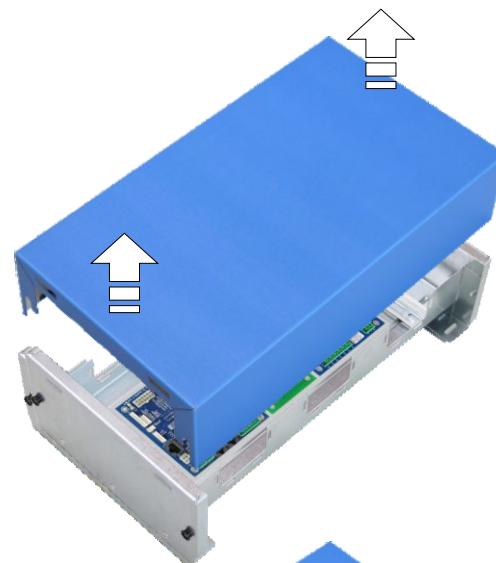
- In case something is wrong during the procedure, the error is registered in the menu "ERRORS" (i.e.: 52=er7 Error VVVF), if so, erase all errors and repeat the procedure.
- At the end of the procedure, press the UP/DOWN button and check the correct movement direction of the car; if not correct, invert values of parameters E98 and E99.

 For all details and for the fine tuning of comfort in the elevator car, please refer to the PLAYBOARD user manual.

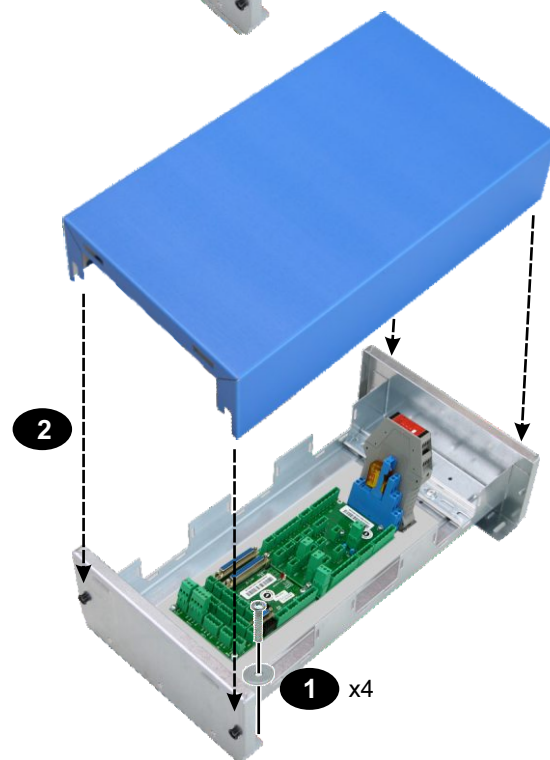
2) TOP OF CAR
2.1) - FIXING THE TOC BOX



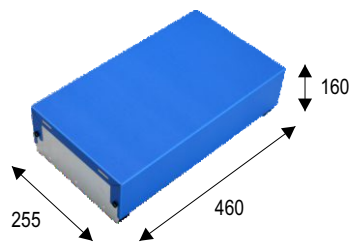
OPENING



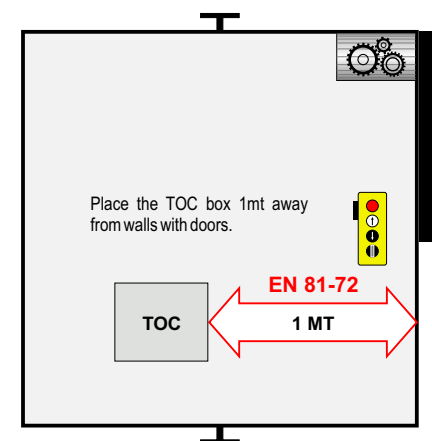
FIXING



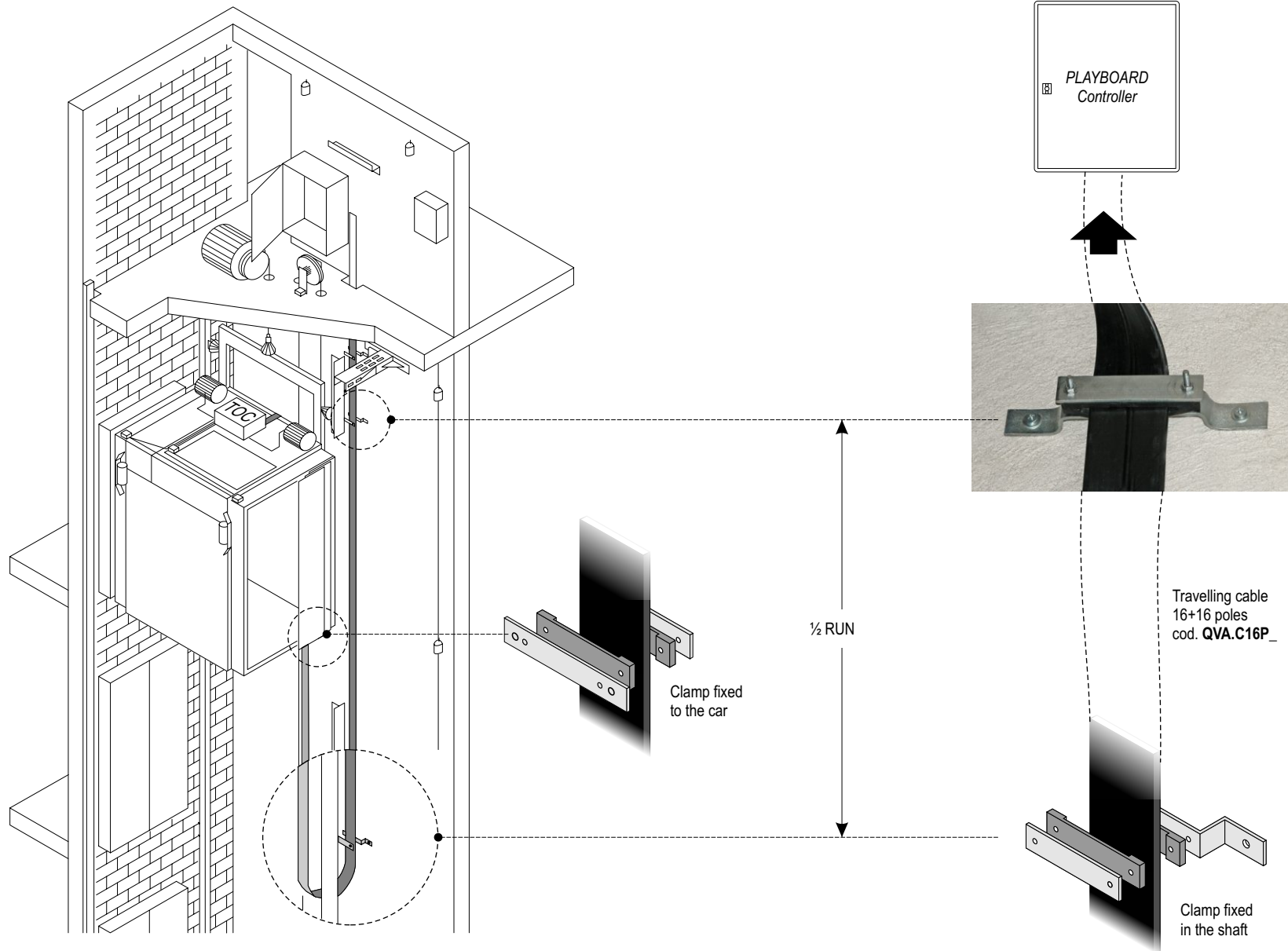
TOC box



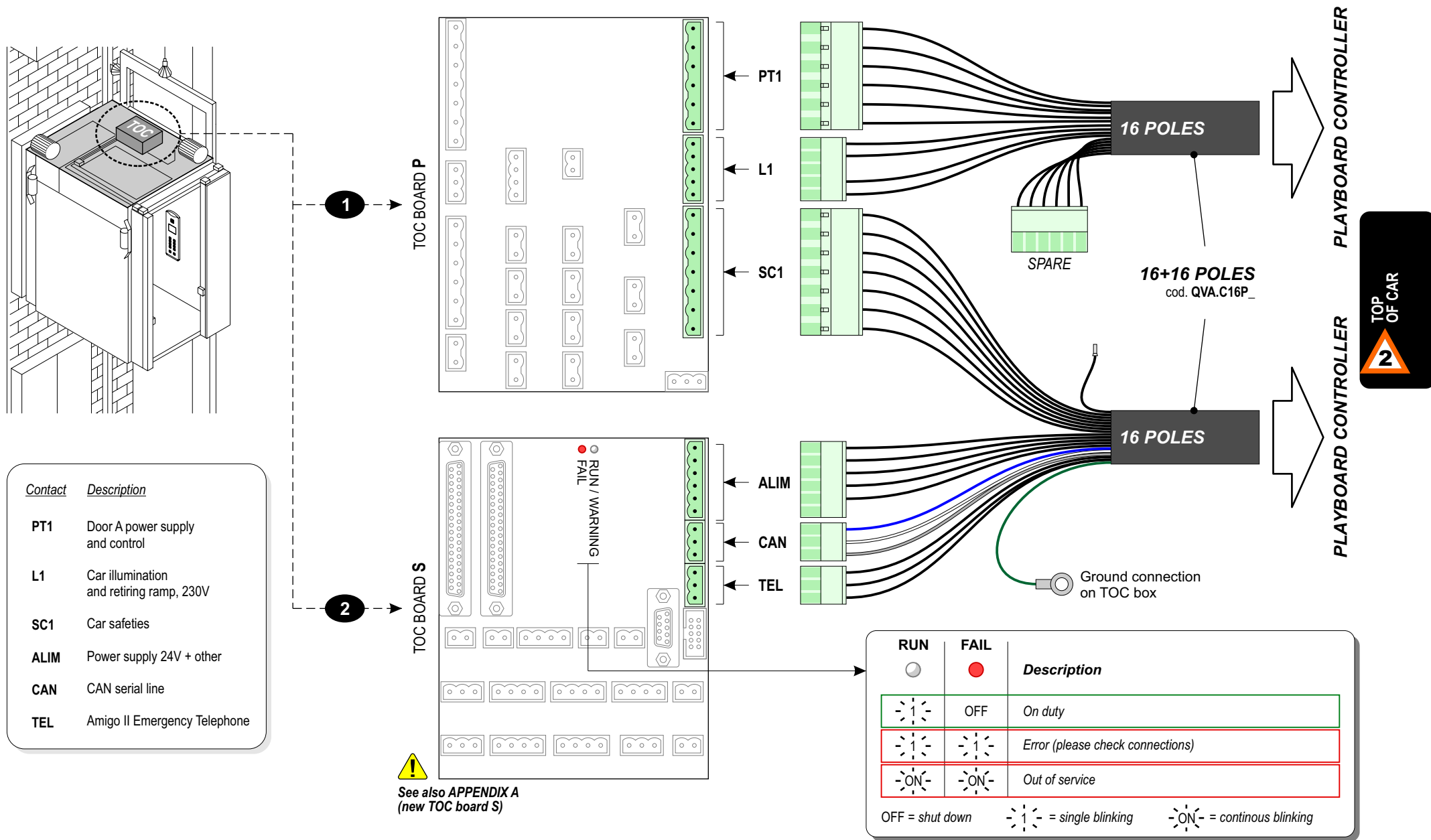
- cod. **QTC.TOCB1AE**
1 door, traction lifts
- cod. **QTC.TOCB1AH**
1 door, hydraulic lifts
- cod. **QTC.TOCB2AE**
2 doors, traction lifts
- cod. **QTC.TOCB2AH**
2 doors, hydraulic lifts
- cod. **QTC.TOCB1AE28**
1 door, traction lifts (28 stops)



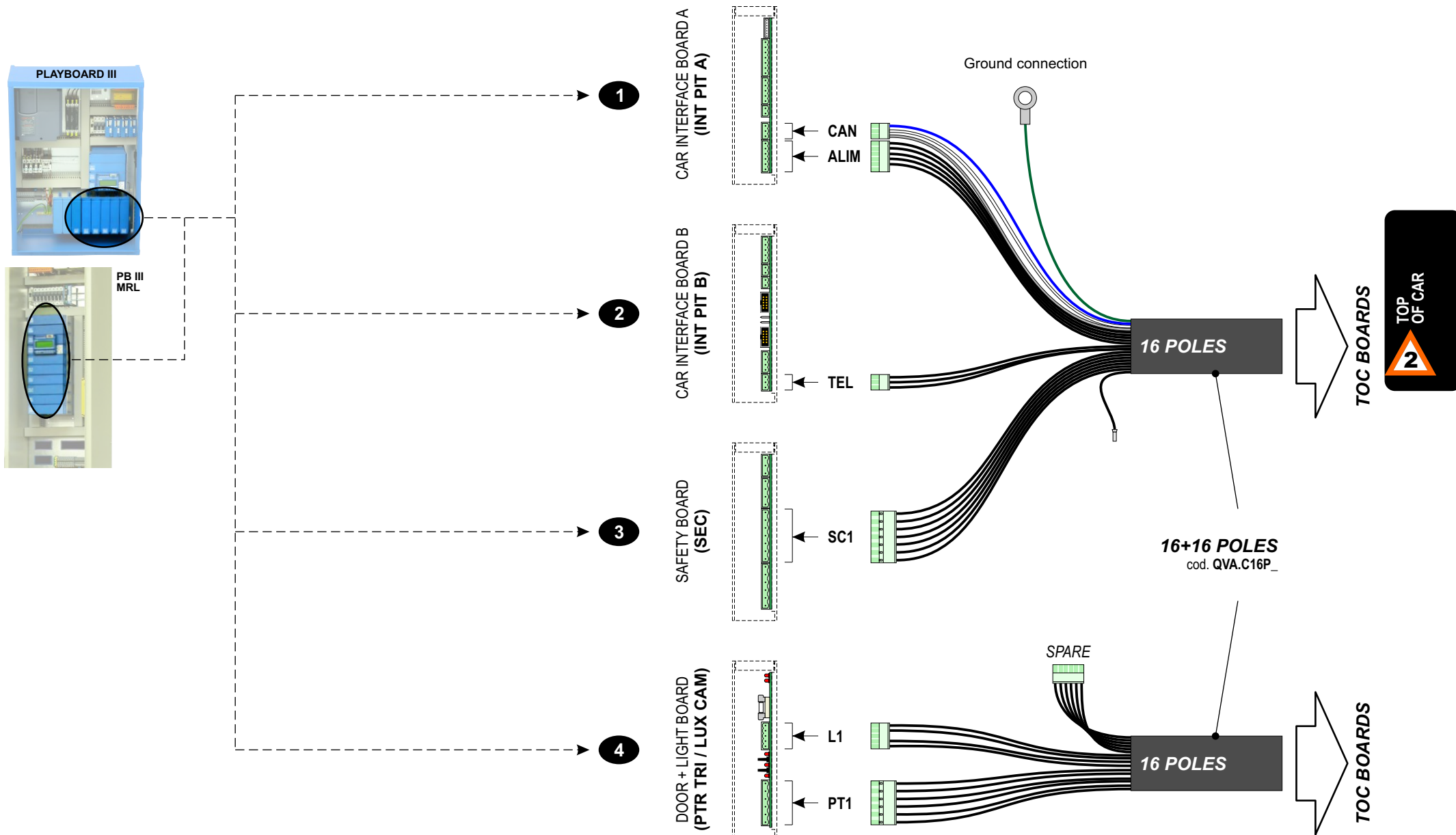
2.2) - INSTALLATION OF TRAVELLING CABLE
2.2.1) - FIXING THE TRAVELLING CABLE IN THE SHAFT



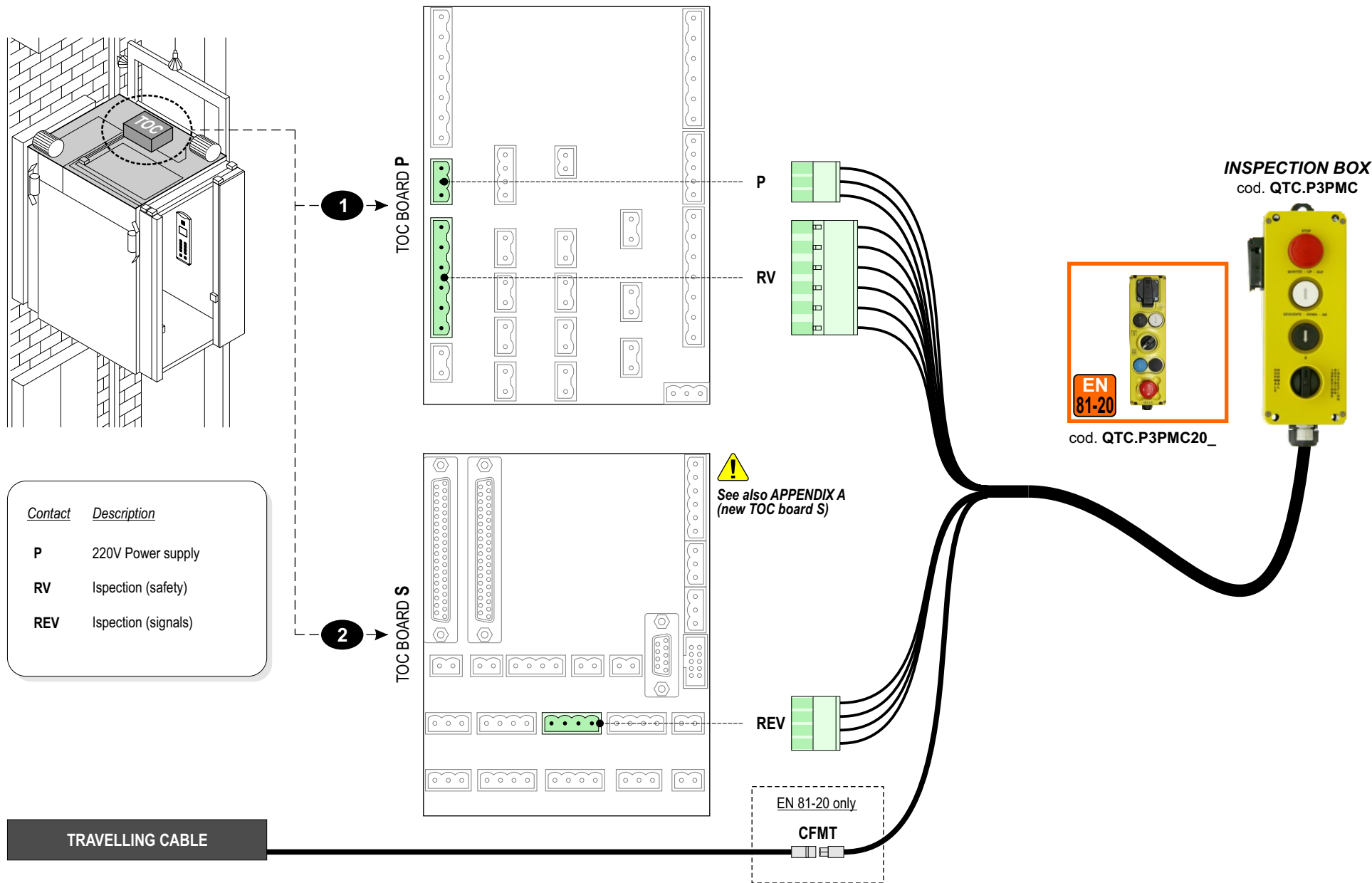
2.2.2) - CONNECTION OF TRAVELLING CABLE TO THE TOP OF CAR BOX



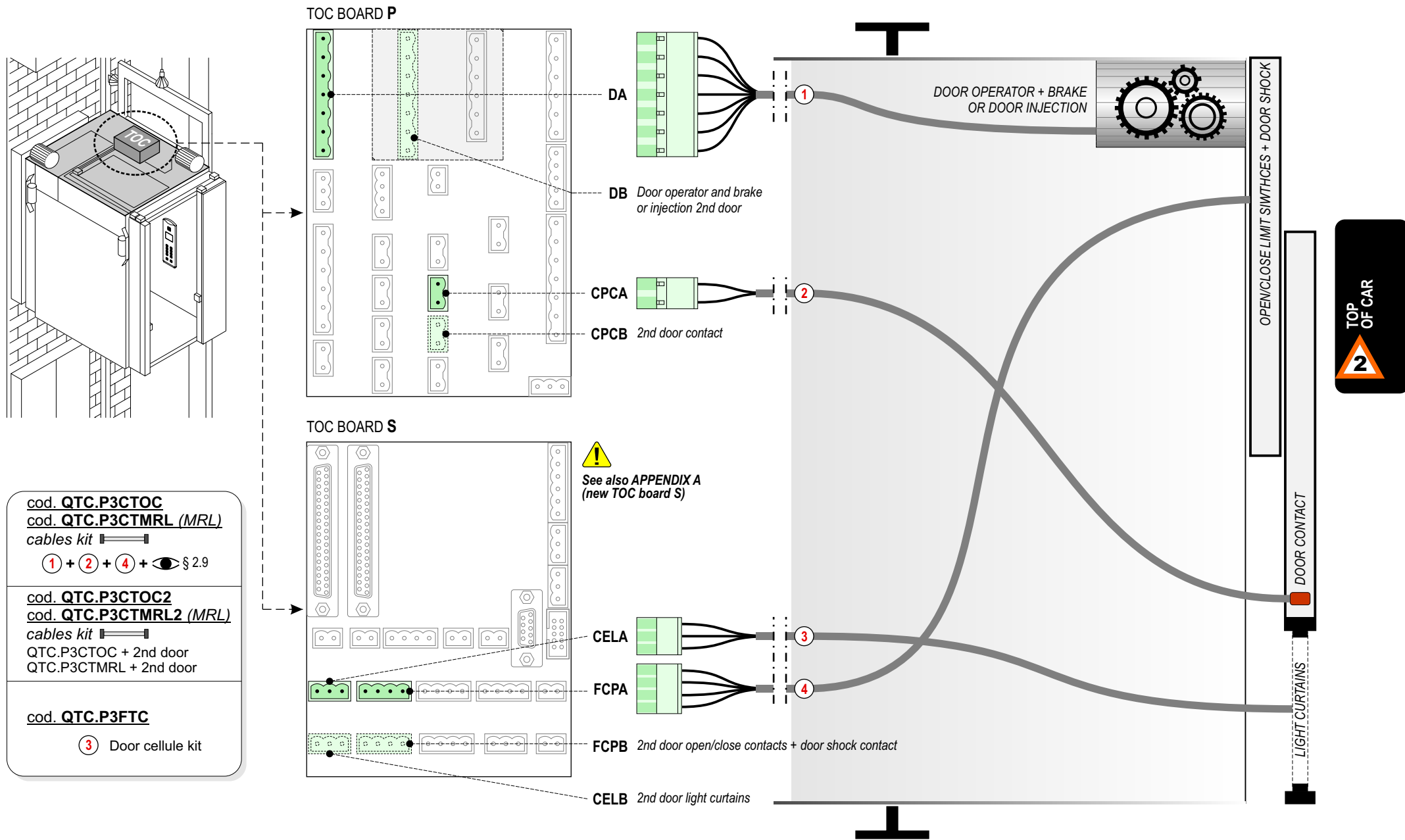
2.2.3) - CONNECTION OF TRAVELLING CABLE TO CONTROLLER



2.3) - CONNECTION OF INSPECTION BOX

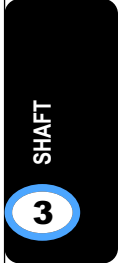
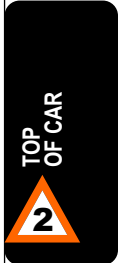
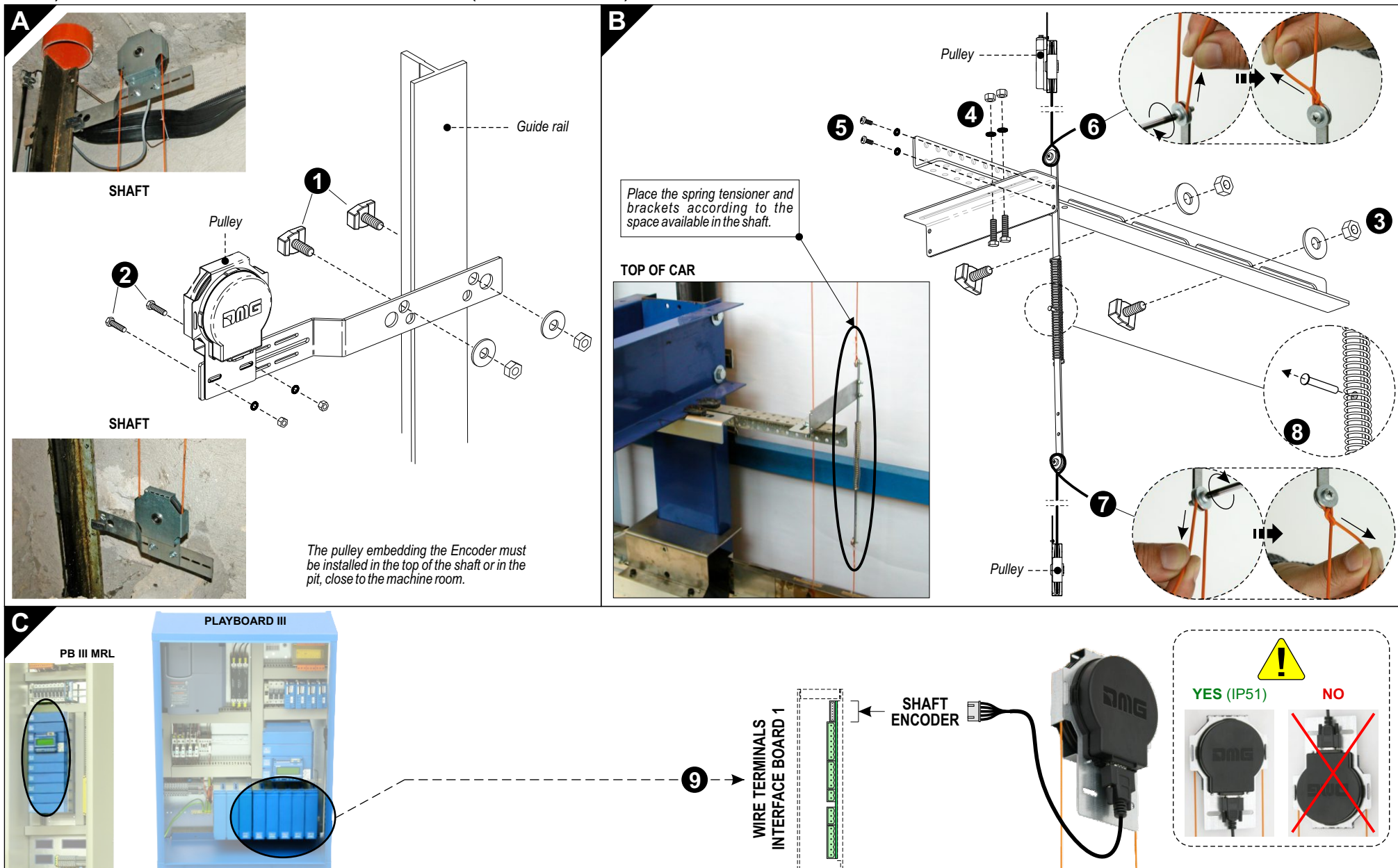


2.4) - CONNECTION OF CAR DOORS

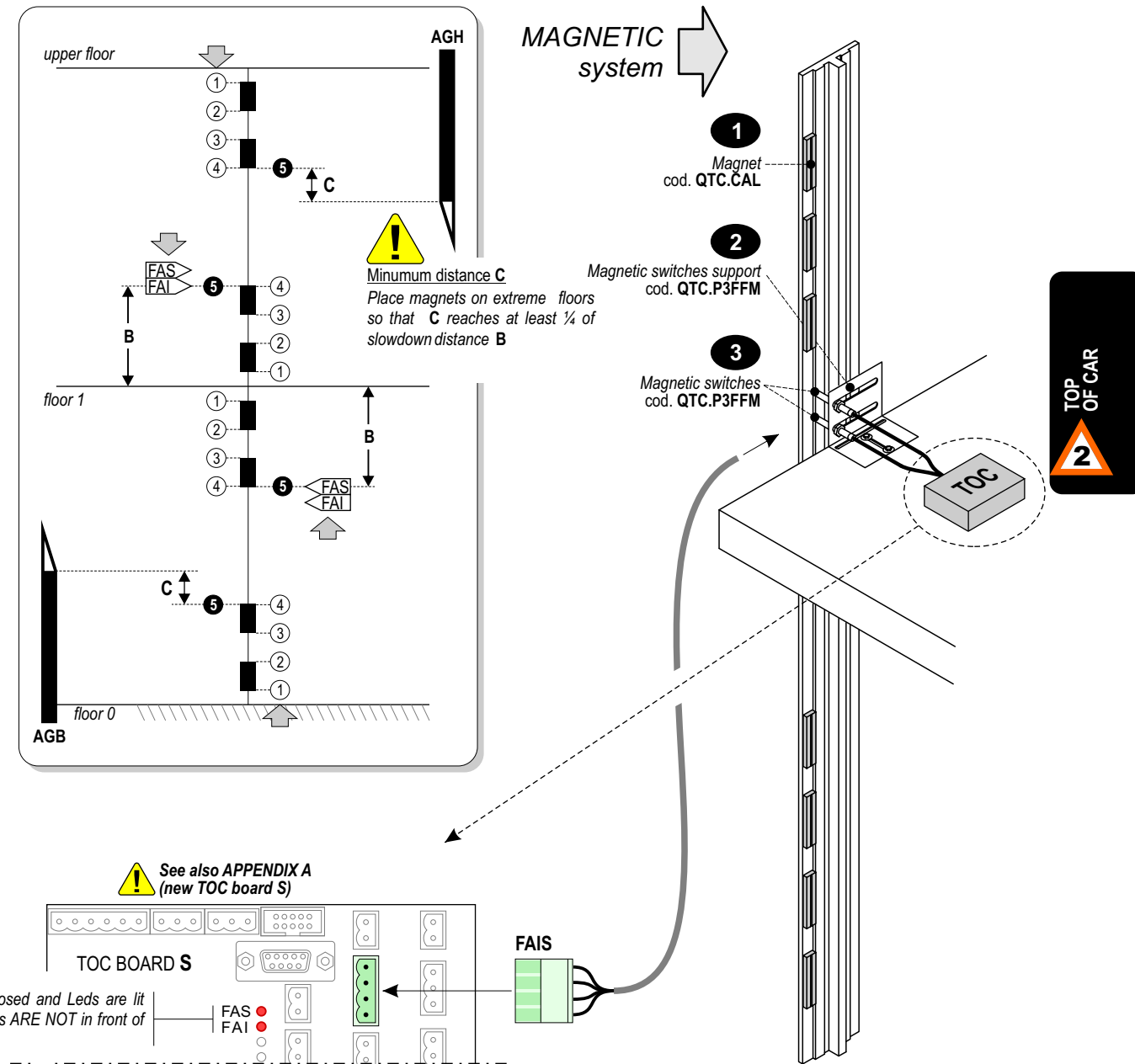


2.5) - INSTALLATION OF POSITIONING SYSTEM

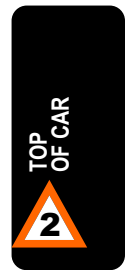
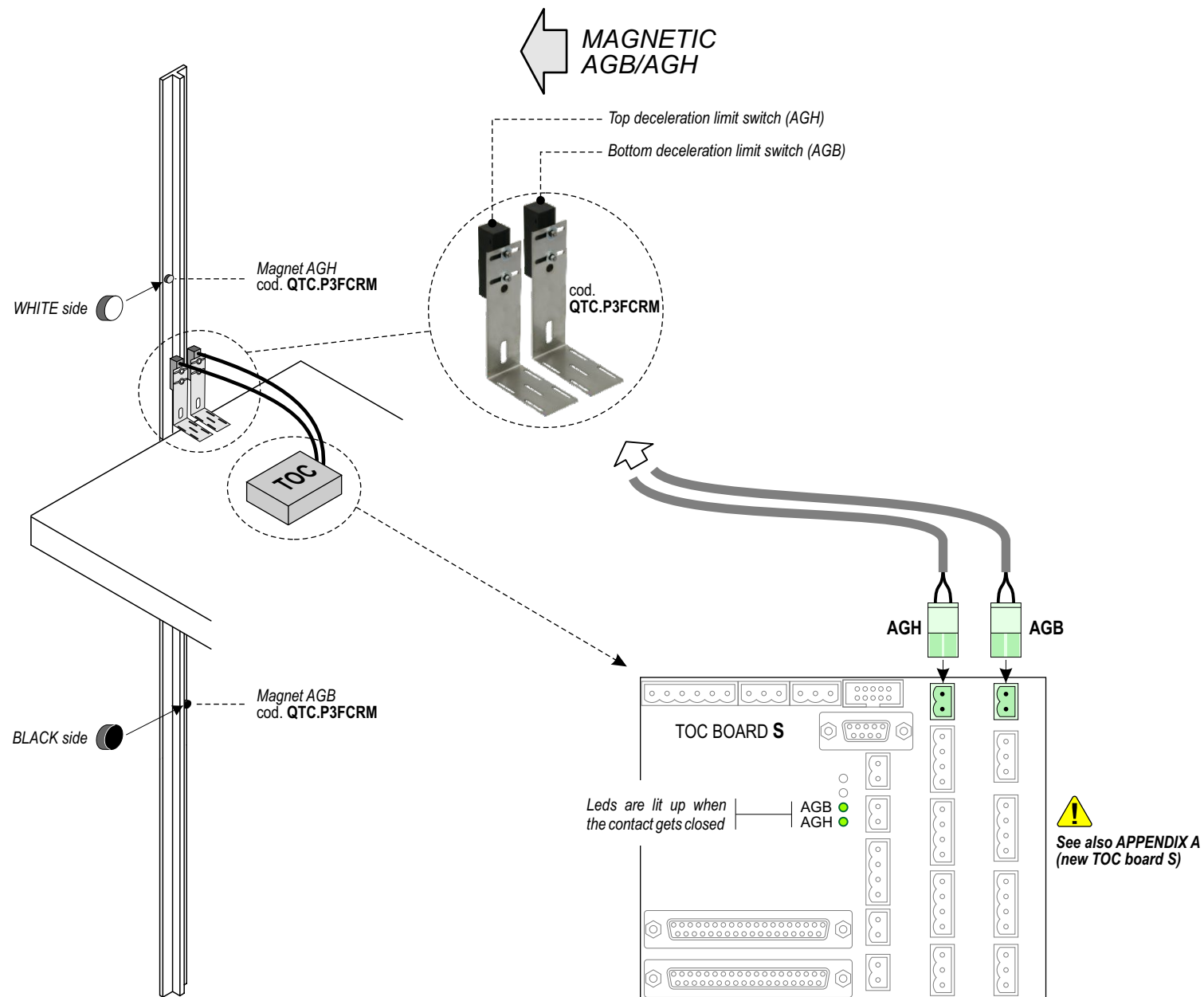
2.5.1) - DMG ROPE AND PULLEY ENCODER (cod. QVA.ENC)



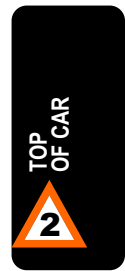
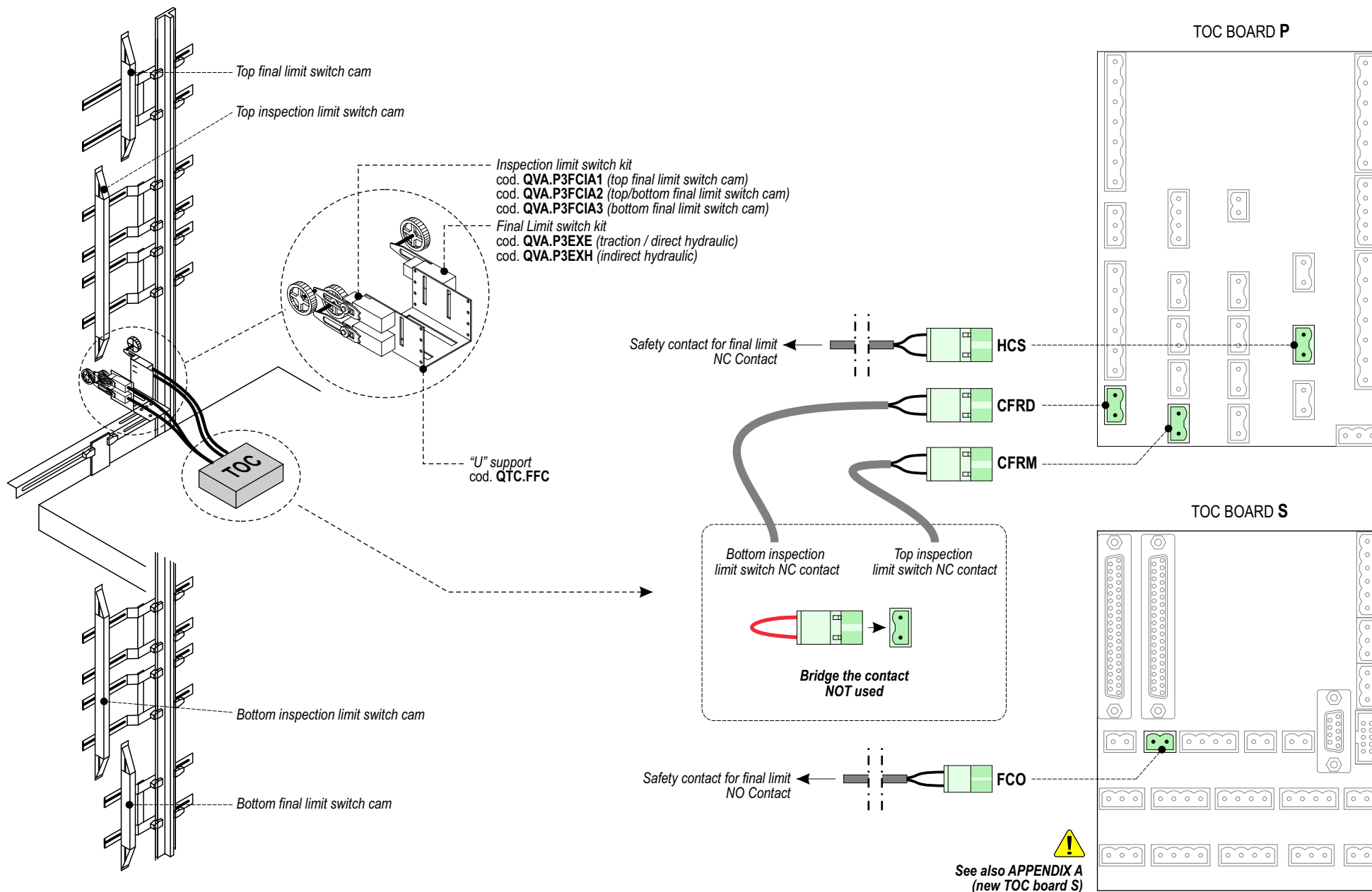
2.5.2) - MAGNETIC POSITIONING SYSTEM (FAI / FAS)



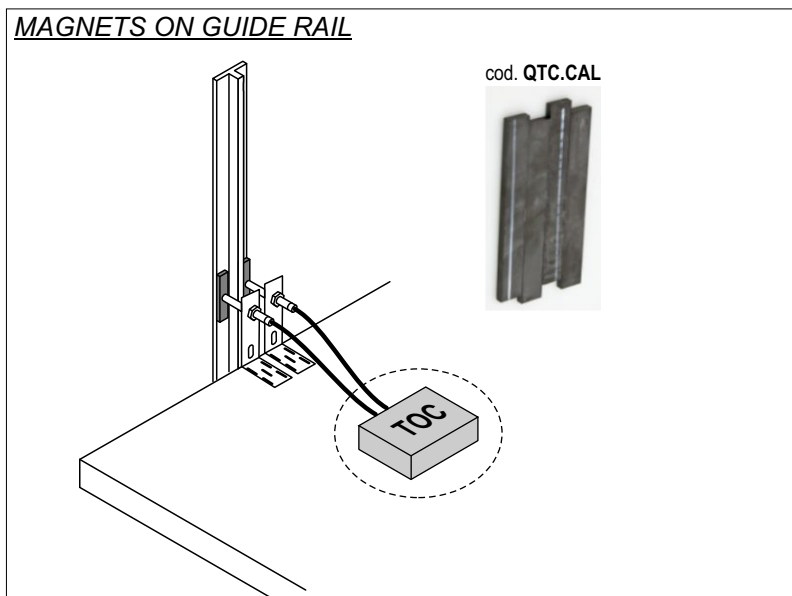
2.6) - INSTALLATION OF TOP/BOTTOM DECELERATION LIMIT SWITCHES (AGB/AGH)



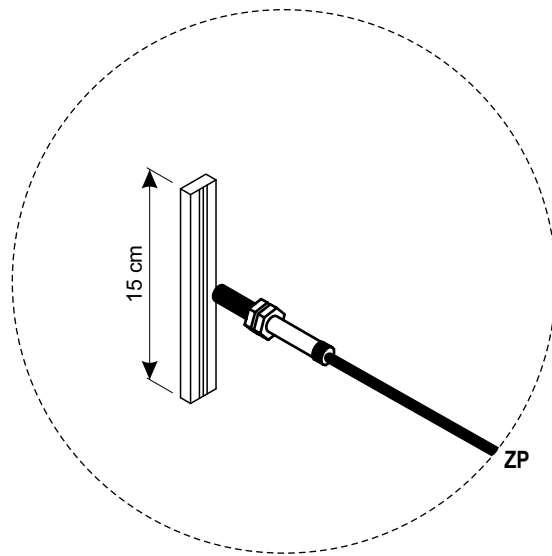
2.7) - INSTALLATION OF INSPECTION AND TOP/BOTTOM FINAL LIMIT SWITCHES



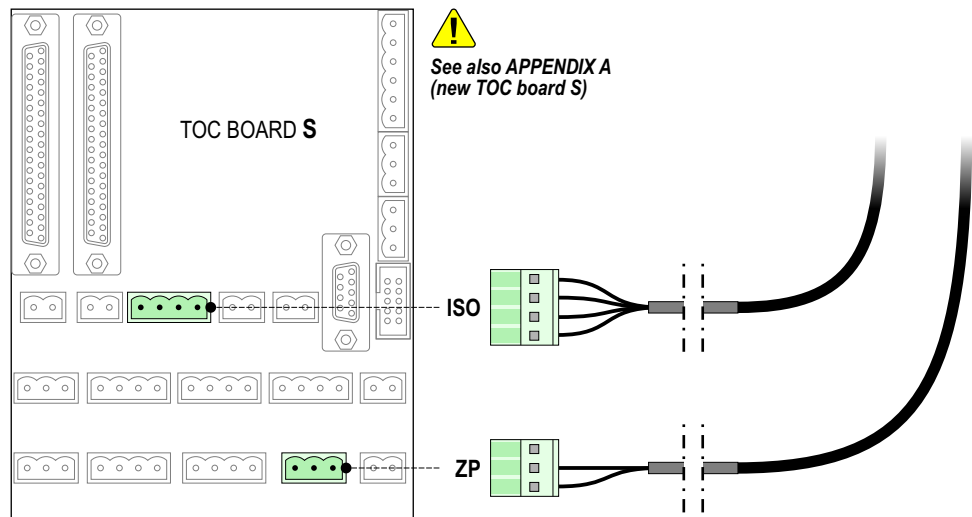
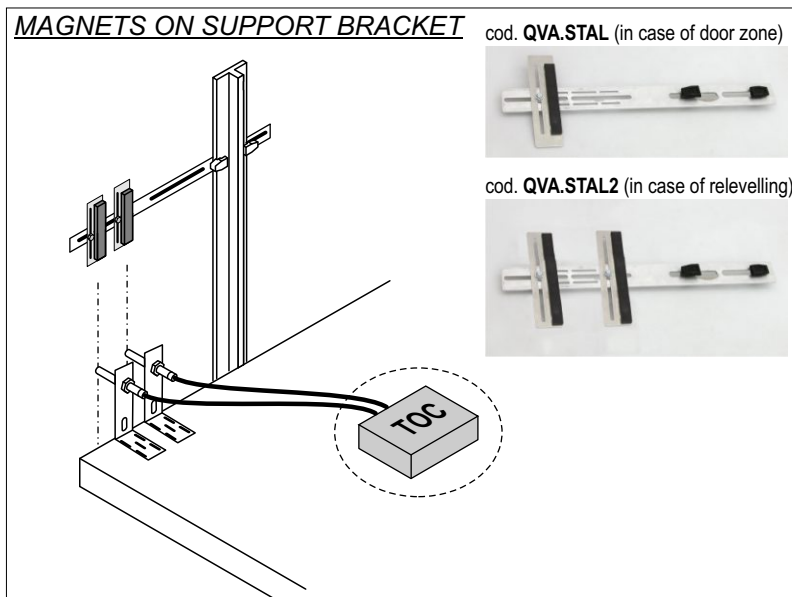
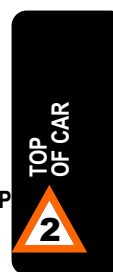
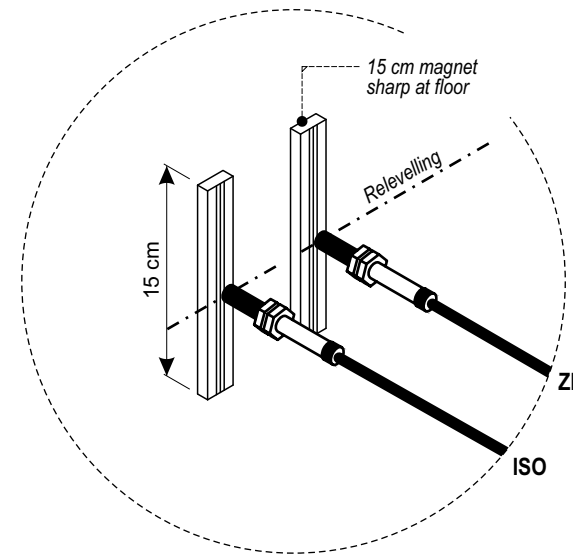
2.8) - INSTALLATION OF DOOR ZONE AND RELEVELLING



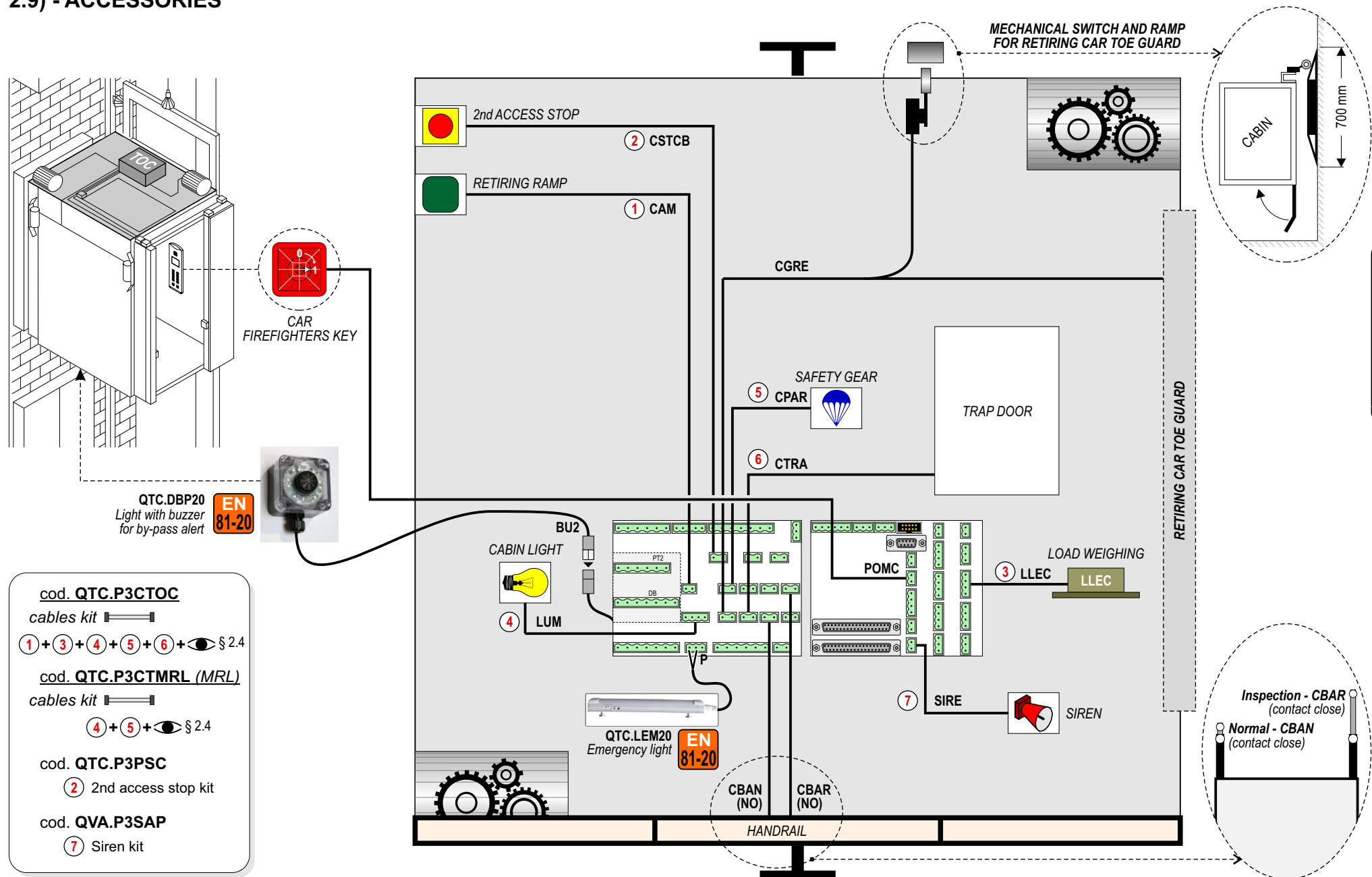
DOOR ZONE
cod. QTC.P3RZP2
Magnetic sensor for door zone unlocking signal



RELEVELLING
cod. QTC.P3RZP1
Magnetic sensors for car relevelling and door zone unlocking signal

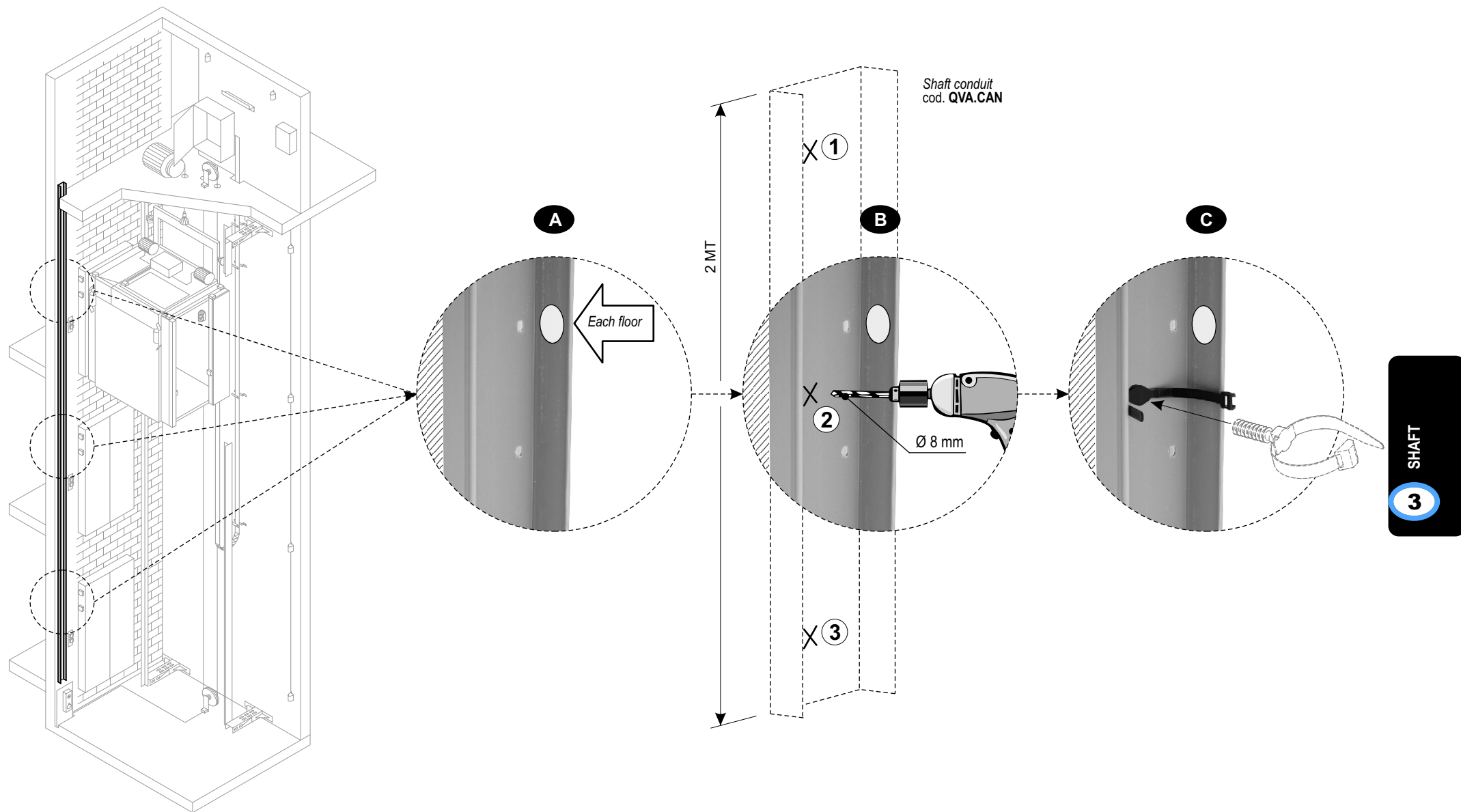


2.9) - ACCESSORIES

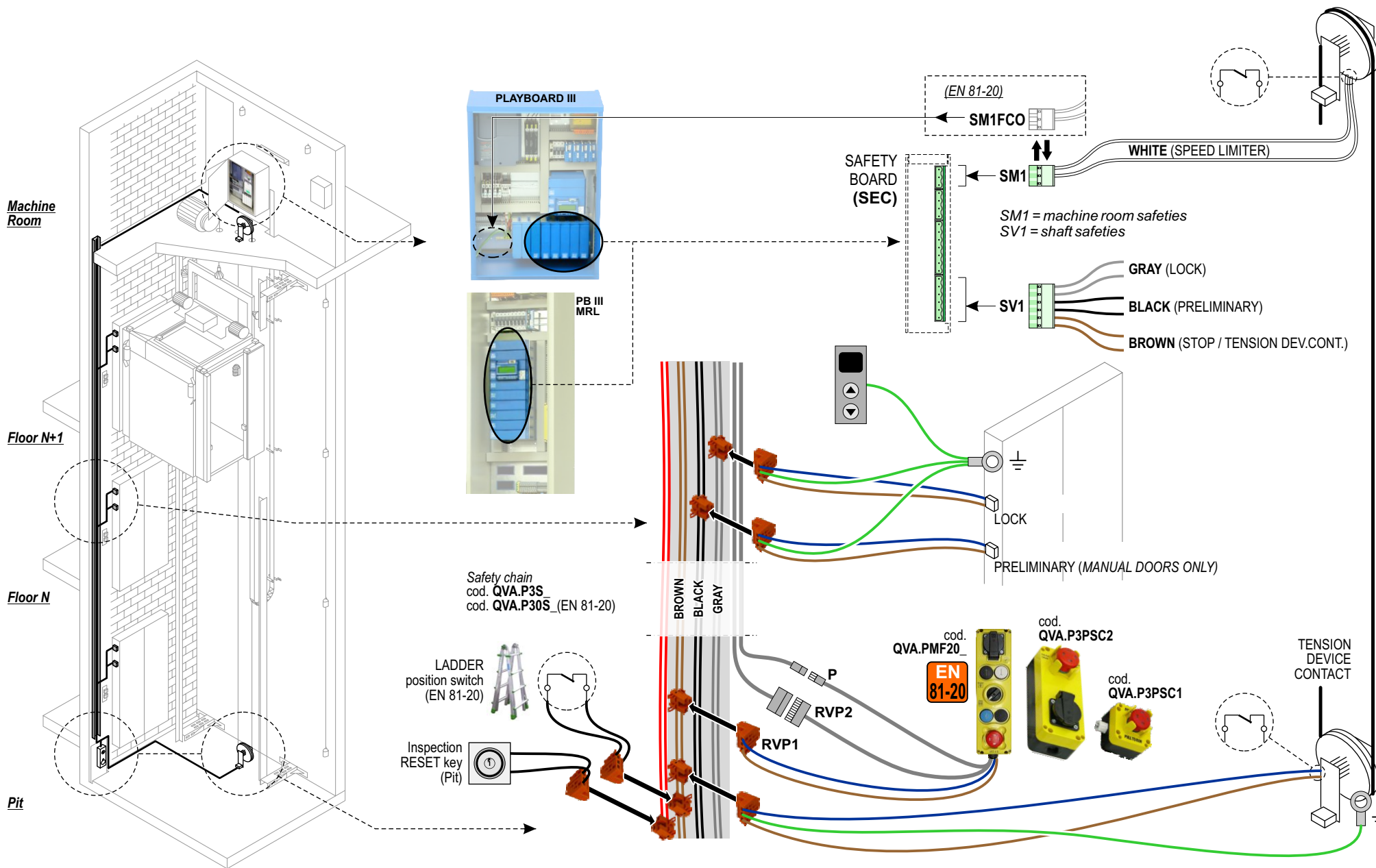


3) SHAFT

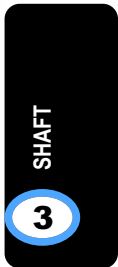
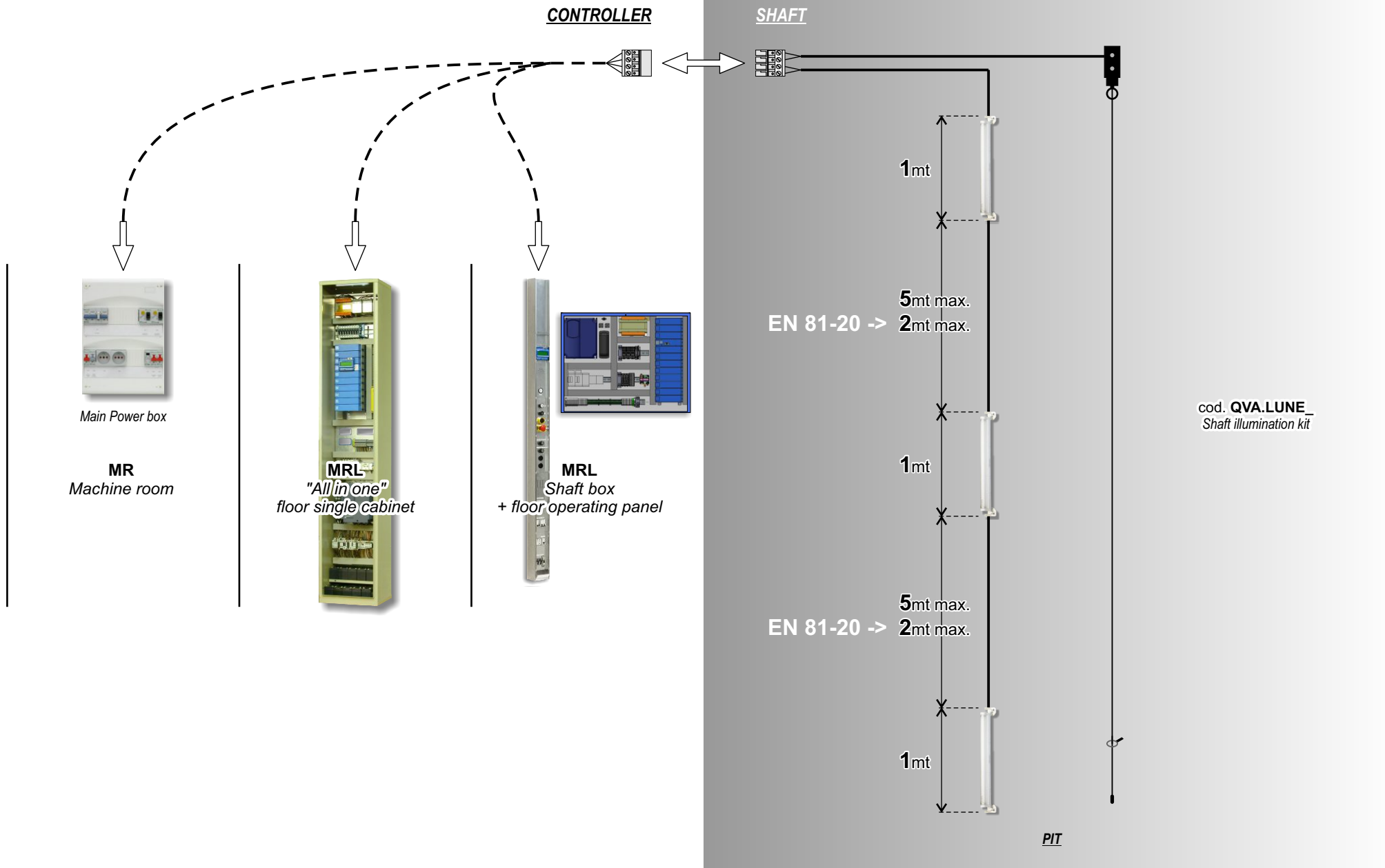
3.1) - MOUNTING OF SHAFT CONDUIT (for shaft wirings)



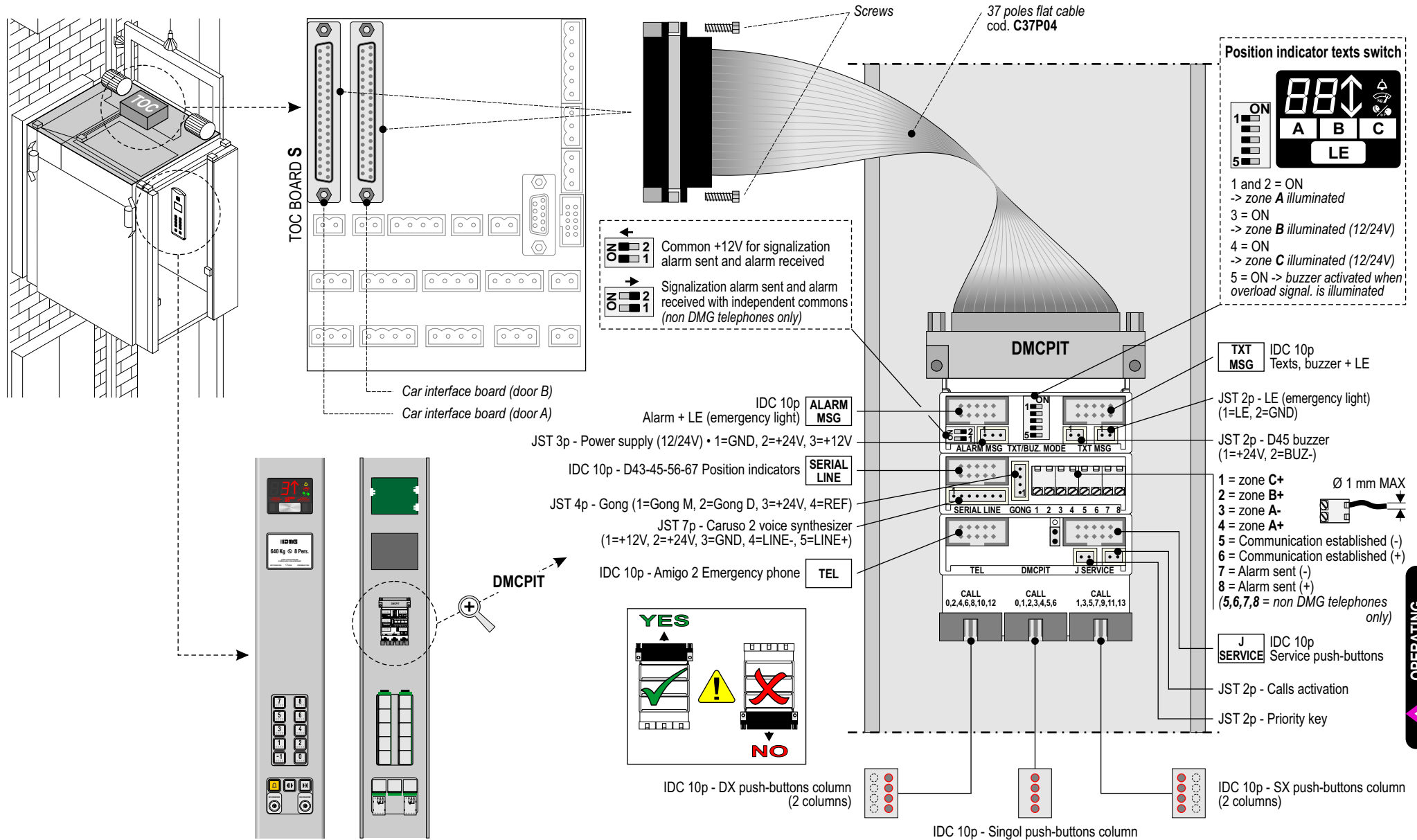
3.2) - INSTALLATION OF SAFETY CHAIN



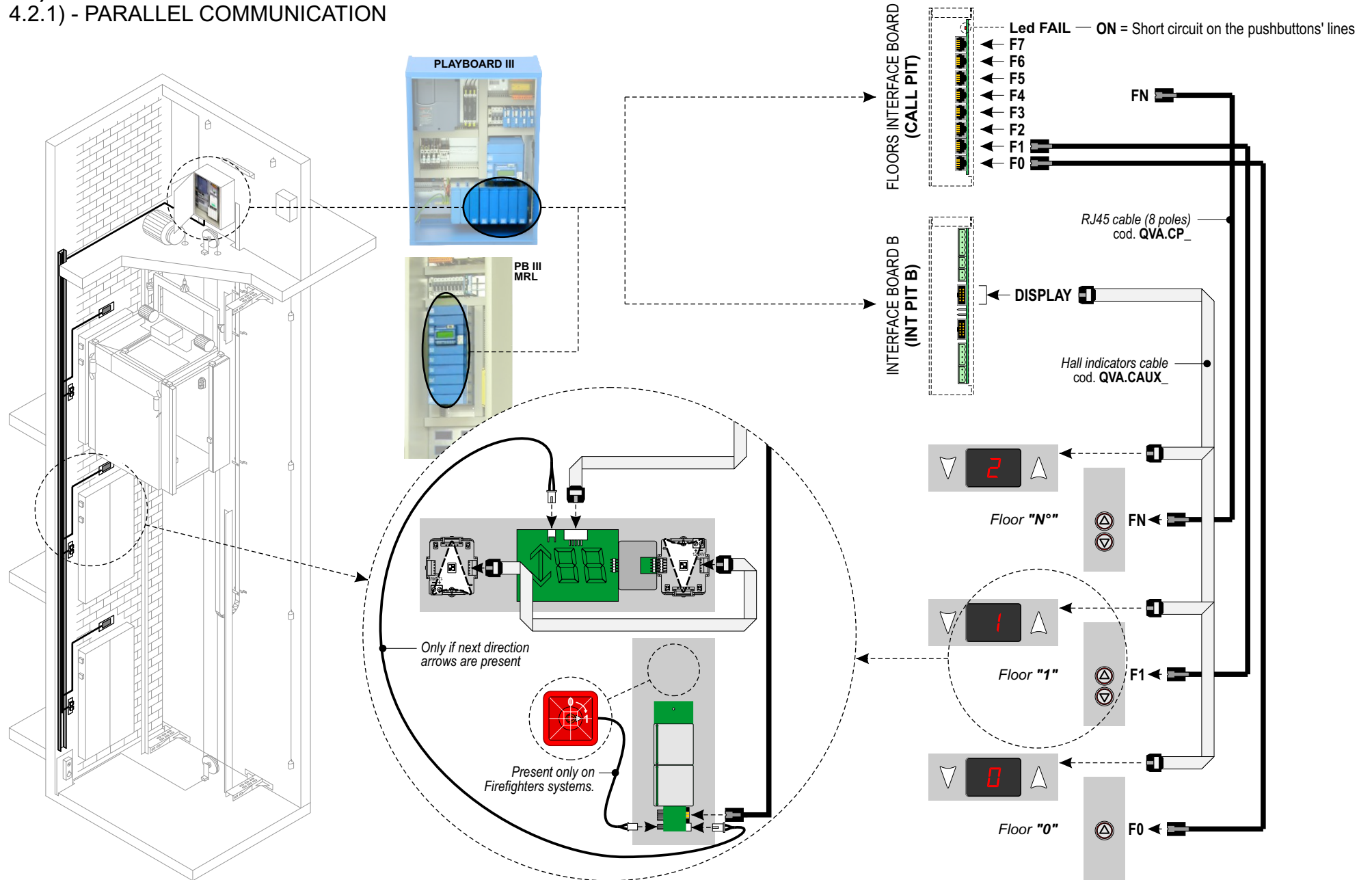
3.3) - SHAFT ILLUMINATION



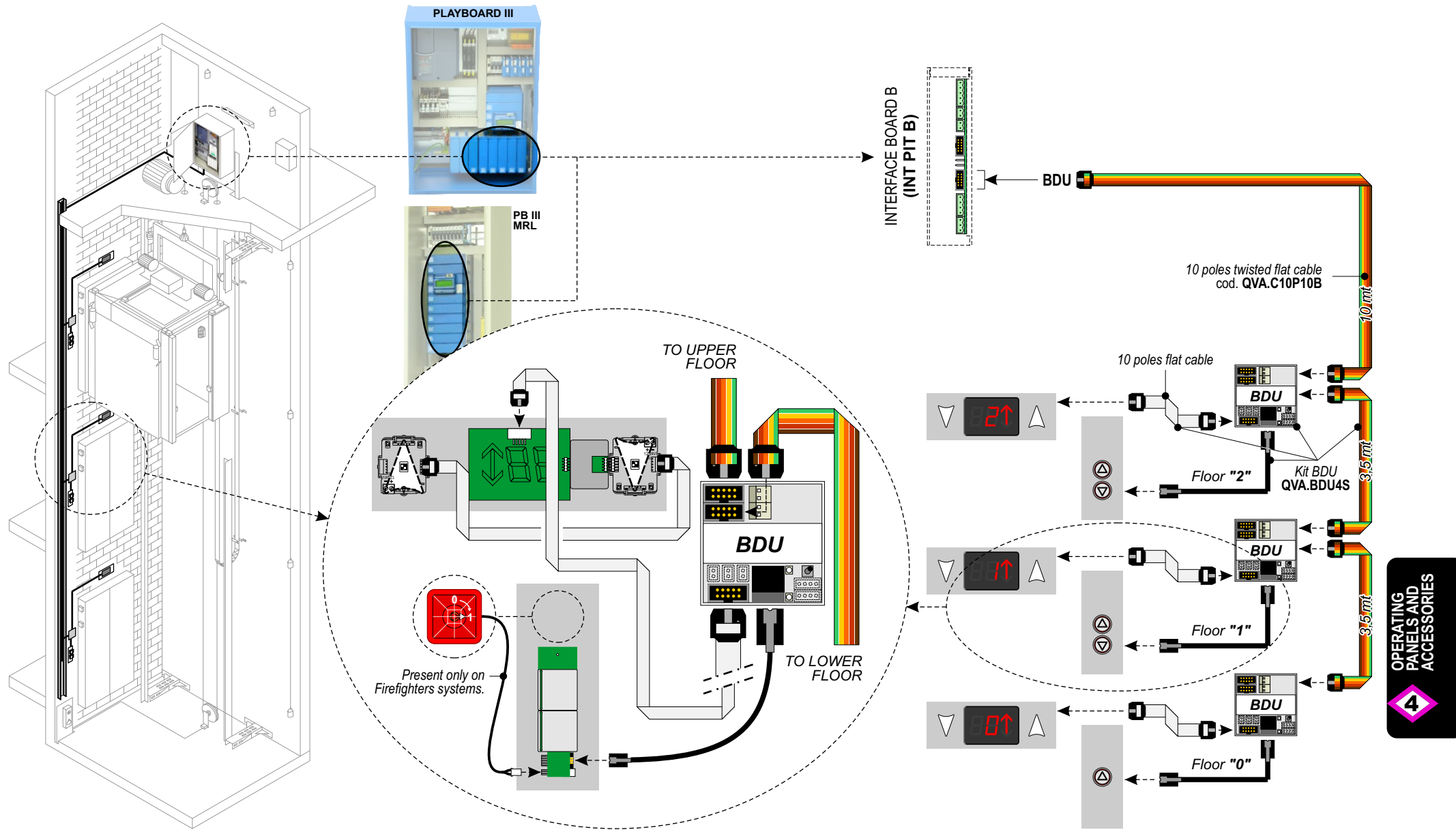
4) CAR OPERATING PANELS AND ACCESSORIES
4.1) - INSTALLATION OF CAR PANEL



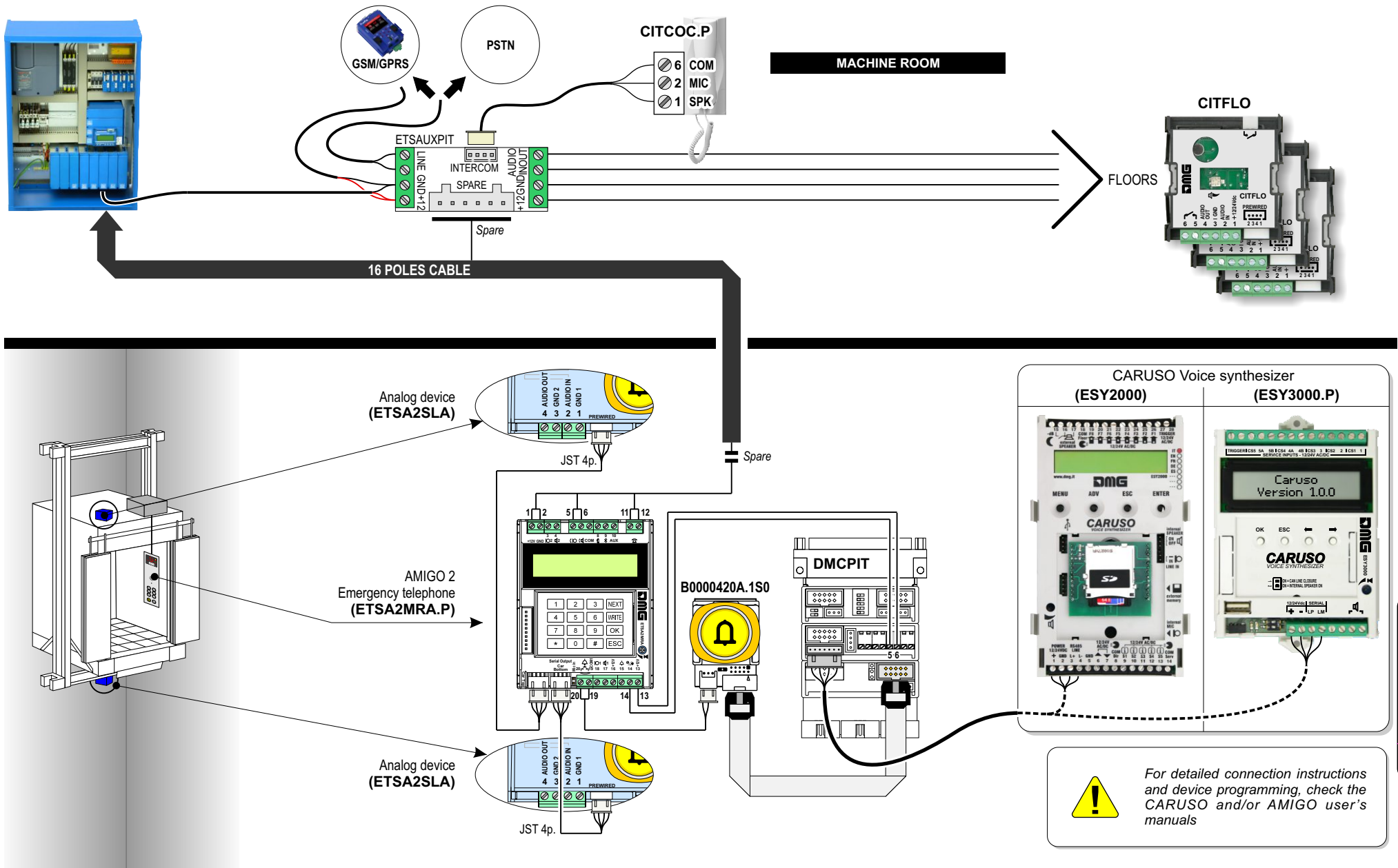
4.2) - INSTALLATION OF HALL PANELS
4.2.1) - PARALLEL COMMUNICATION



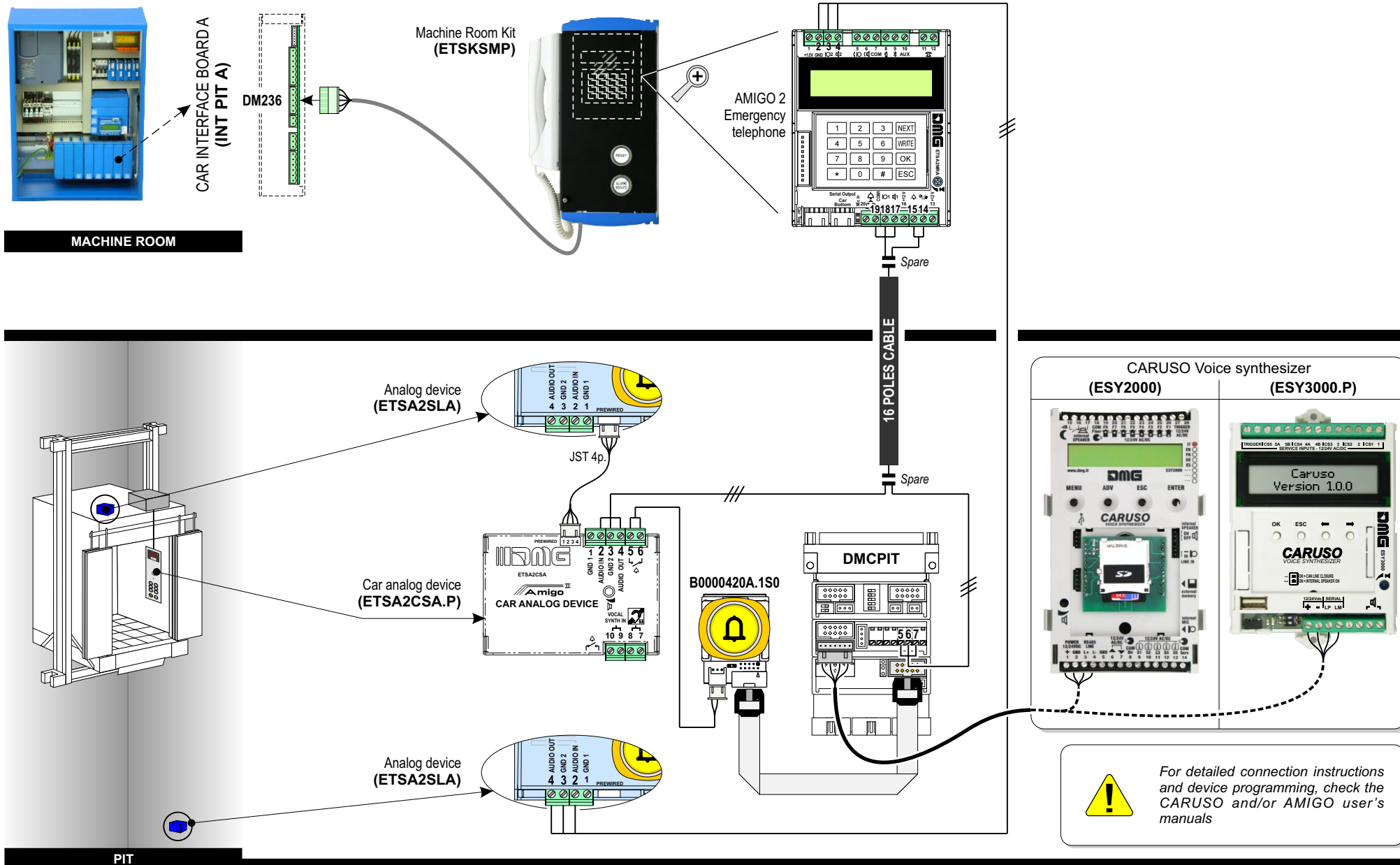
4.2.2) - SERIAL COMMUNICATION (BDU)



4.3) - VOICE SYNTHESIZER AND AMIGO 2 EMERGENCY PHONE (3 device configuration)



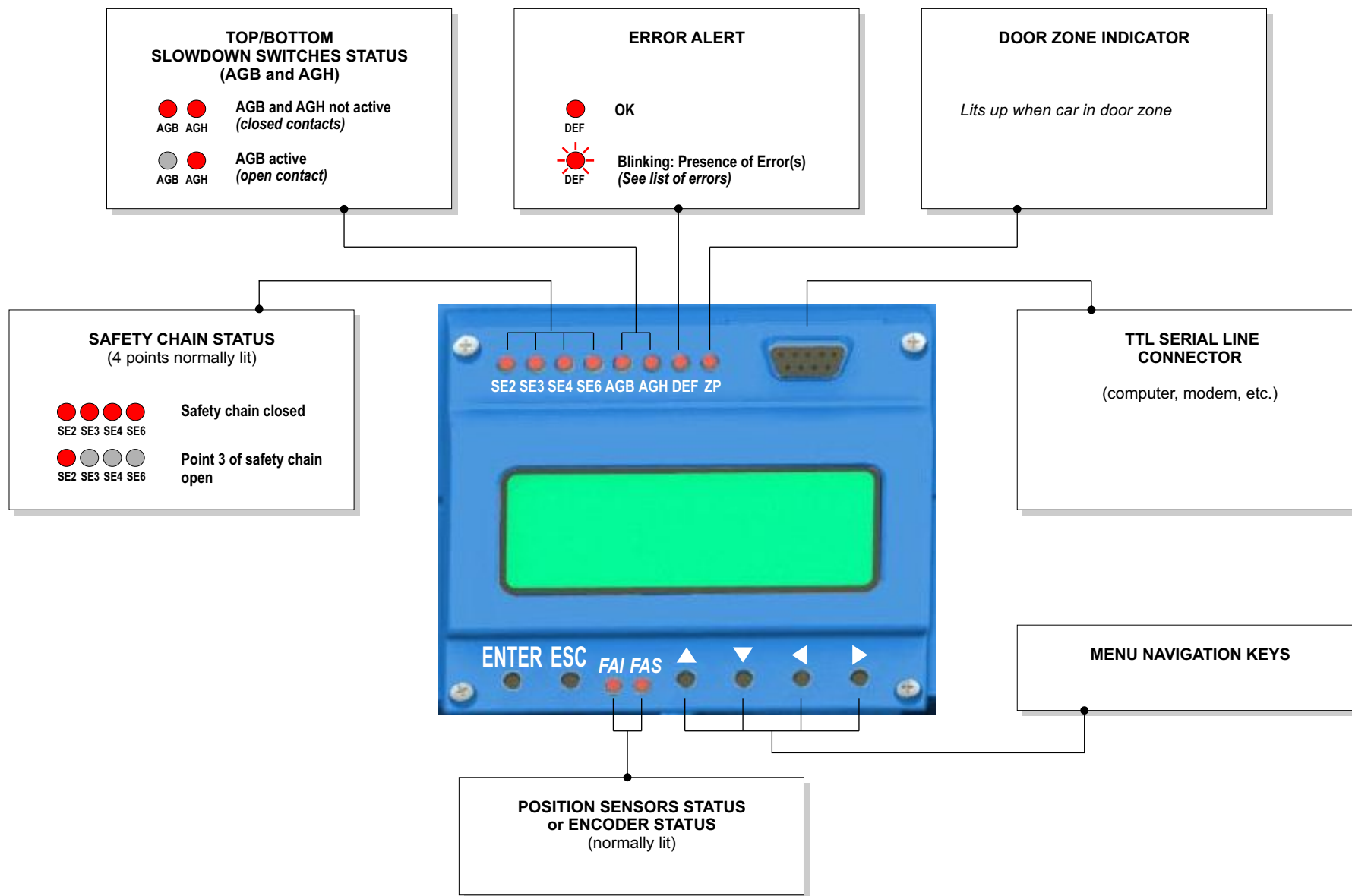
(4 device configuration)



OPERATING
PANELS AND
ACCESSORIES
4

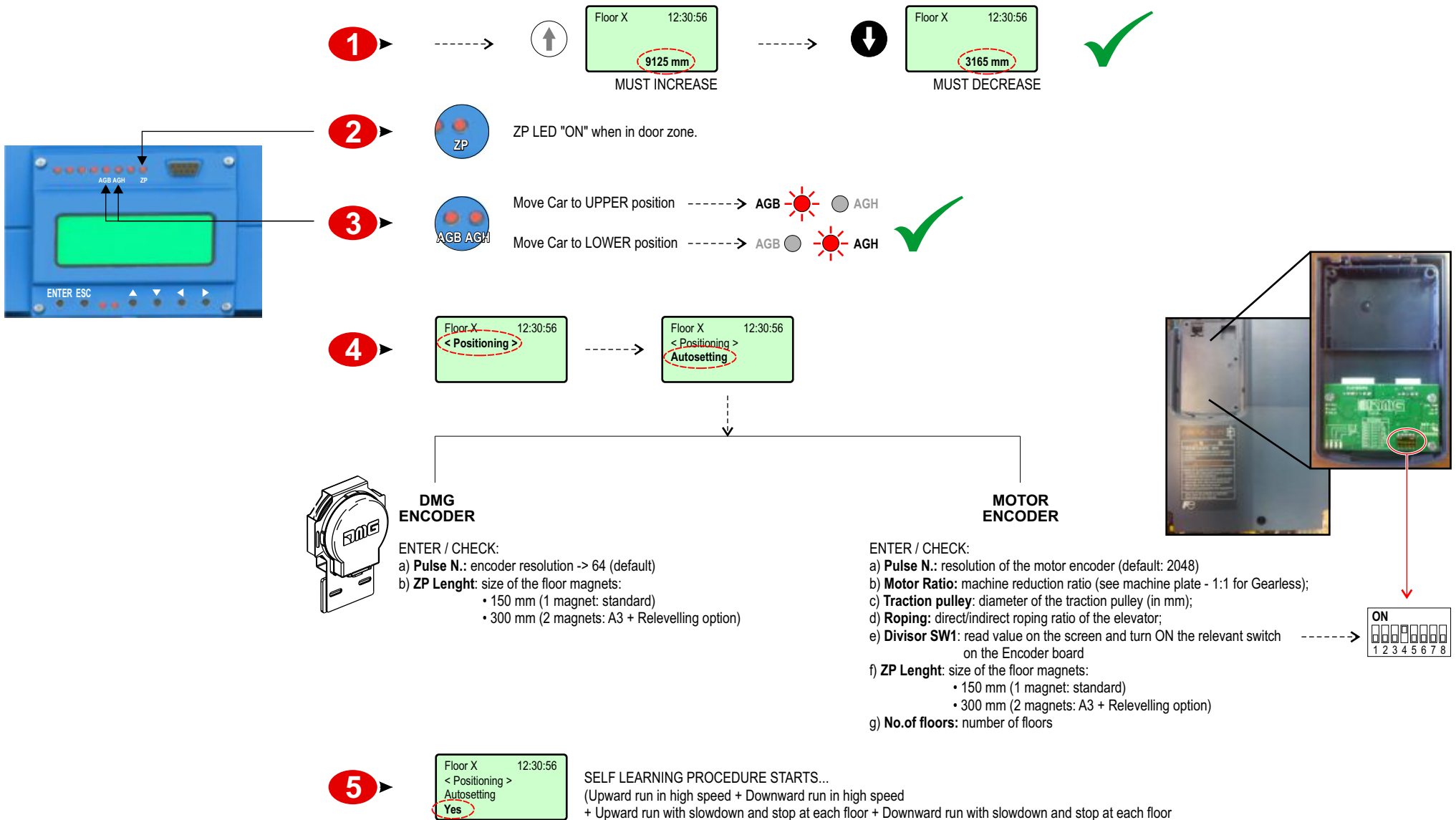
! For detailed connection instructions and device programming, check the CARUSO and/or AMIGO user's manuals

5) USE OF "PLAYPAD" PROGRAMMING MODULE

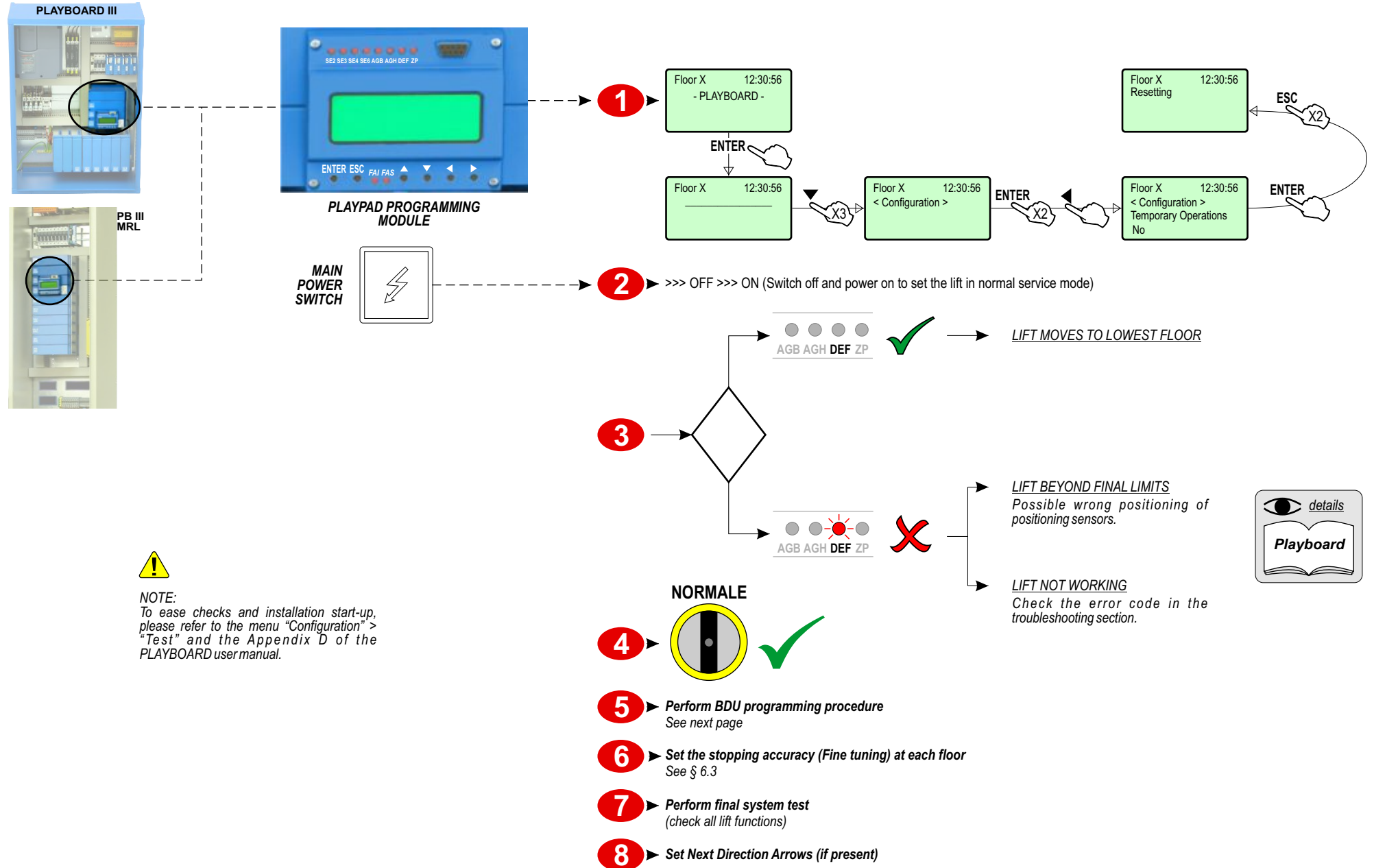


6) FINAL ADJUSTMENTS AND NORMAL SERVICE MODE

6.1) - BASIC CHECKS AND FLOOR SELF LEARNING PROCEDURE

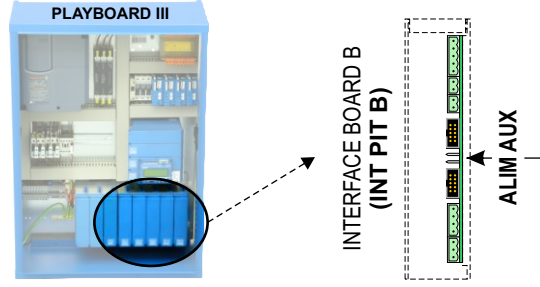


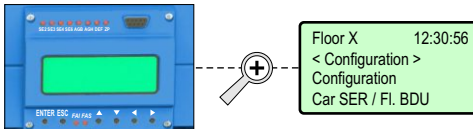
6.2) - PASSAGE TO NORMAL SERVICE MODE

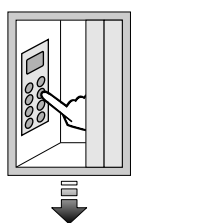


BDU PROGRAMMING PROCEDURE

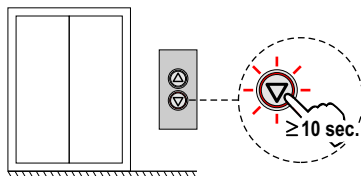
- 1** Connect all the BDUs on every floor (§ 4.2.2).
If provided, connect the auxiliary power as shown in the picture.

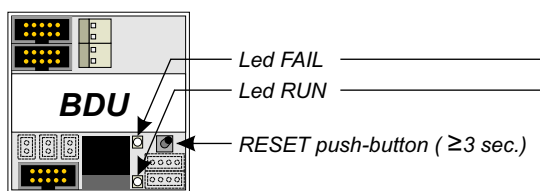

- 2** In the <Configuration> menu, check the "Configuration" parameter is set to "Car SER / FI. BDU"


- 3** To program the BDU at floor 1, move car to floor 1.

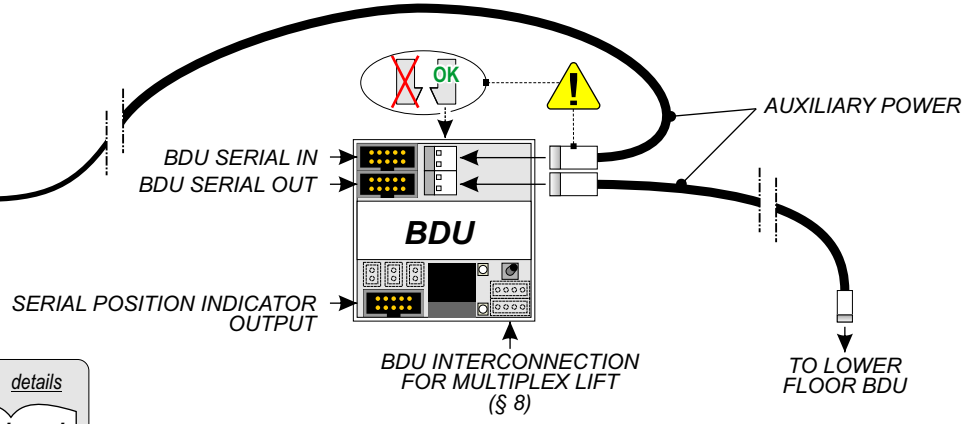

- 4** Press the floor call button (down arrow) for at least 10 seconds. Verify that when the button is released it stops blinking.

From now the BDU is programmed.


- 5** Repeat steps 3 and 4 for all floors.
- 6** In case of malfunction, check LEDs status and start the reset sequence pressing the reset button for at least 3 seconds.



BDU INTERCONNECTION FOR MULTIPLEX LIFT (§ 8)



FAIL	RUN	Description
OFF	-ON-	On duty
OFF	OFF	Out of service (not powered / broken power supplier)
ON	OFF	Out of service (micro fault / not programmed)
ON	-1-	Out of service (serial line communication)
ON	-2-	Out of service (undefined BDU address)
ON	-8-	Out of service (test in progress)

Legend

ON = power up -ON- = continous blinking
 OFF = shut down -N°- = N° time blinking

NOTE: In case of multiplex lift (§ 8) the procedure must be repeated for each installation (all others must be switched off during the procedure)

6.3) - SETTING FLOOR STOPPING ACCURACY

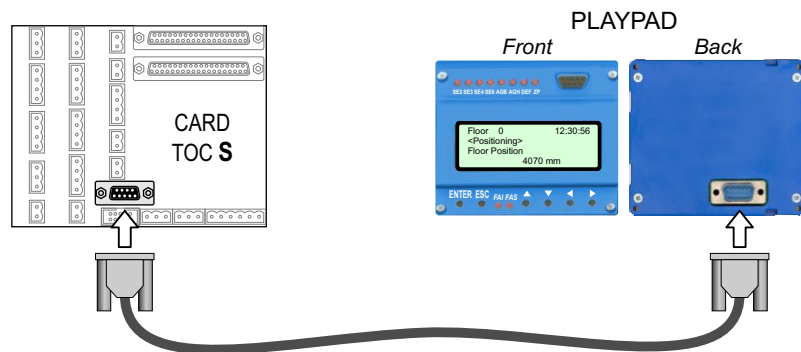
with
DMG OPTICAL ENCODER / MOTOR ENCODER



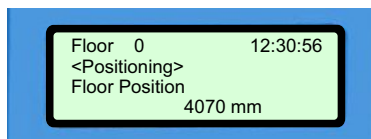
with
FAI/FAS OPTICAL/MAGNETIC POSITIONING SYSTEM



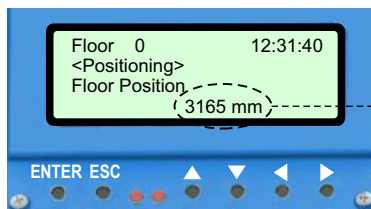
- 1 Use the PLAYPAD module on the controller. Alternatively, remove the module from its housing inside the controller, plug it on the "S" card in the Top of Car box through the 9 poles cable (optional) and use it directly inside the cabin.



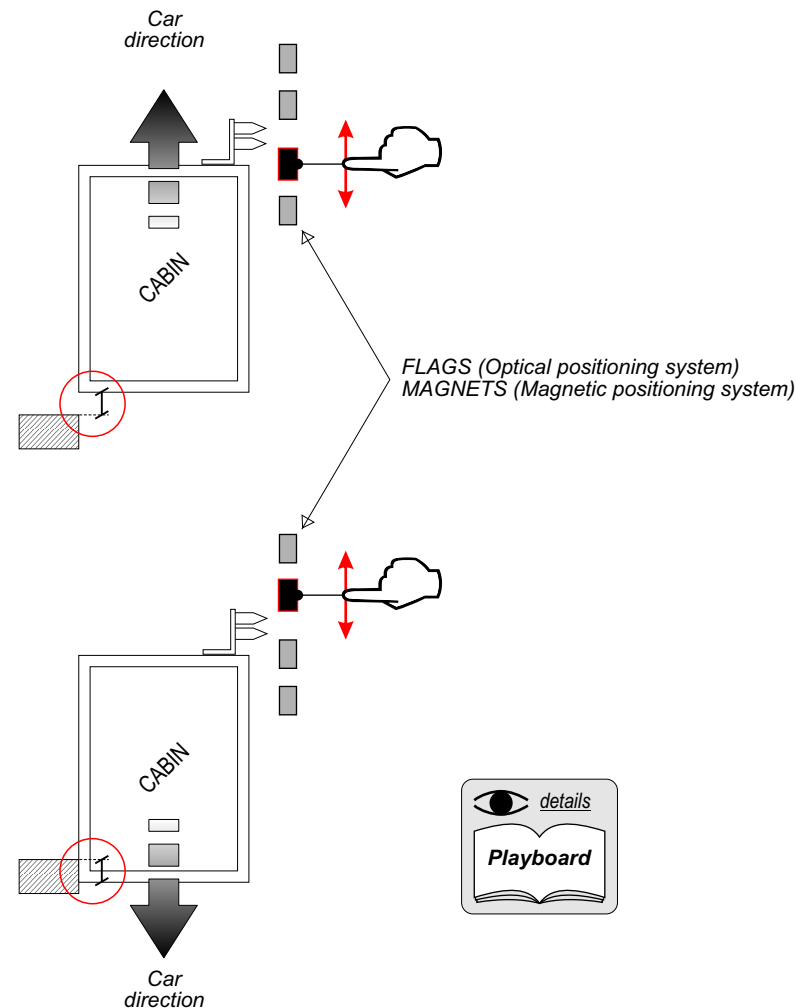
- 2 Enter the <Positioning> Menu, select the "Floor Position" parameter which indicates the exact position (in mm) of each floor and press [ENTER] to modify it.



- 3 From within the cabin, use the PLAYPAD module keys to set the stopping accuracy by increasing or decreasing the position.



- 4 When the correct floor positioning is reached, press [ENTER] to store it.



6.4) - ROLLBACK CONTROL AND COMFORT ADJUSTMENTS (CLOSED-LOOP VVVF CONTROLLERS)

6.4.1) - Starting phase adjustments

PARAMETER	DESCRIPTION	DEFAULT	SUGGESTED ADJUSTMENTS
F24	Starting speed holding time	0	Do not change this value, unless the installation is equipped with digital positioning system (Magnetic detectors – See § 6.4.5)
H64	Zero speed control time	0,7	Set value between 0,7 and 0,8 then increase to soften start phase ramp. <i>Important: Enter the "Positioning" Menu and check parameters DIR-BRK (must be kept low: 0,1-0,2) and BRK-S (must be kept higher than H64)</i>
H65	Soft Starter activation	0,1	Enter same value as in DIR-BRK ("Positioning" Menu)
L66	RBC activation time at zero speed (Specifies the maximum time length for estimating an unbalanced load)	2 s	Do not change this value
L68	RBC Proportional Gain (P constant) (specifies the P constant of the Automatic Speed Regulator to be used during RBC calculation time)	2,5	Motor overshoots: increase value by 0,25 Vibrations: decrease value by 0,25
L69	RBC Integral Time (I constant) (specifies the I constant of the Automatic Speed Regulator to be used during RBC calculation time)	0,003 s	Motor overshoots: decrease value by 0,001 Vibrations: increase value by 0,001
L73	Unbalanced load compensation (specifies the I constant of the Automatic Position Regulator to be used during RBC calculation time)	0	Motor overshoots: increase value by 0,50 Vibrations: decrease value by 0,50
L80	Brake Control (Mode)	1	Do not change this value
L82	ON delay time (specifies the delay time during which the inverter main circuit is kept activated)	0,2 s	Larger Brakes: decrease value by 0,1 Smaller brakes: increase value by 0,1

6.4.2) - High speed phase adjustments

PARAMETER	DESCRIPTION	DEFAULT	SUGGESTED ADJUSTMENTS
L36	"P" Gain constant at high speed	2	Speed fluctuations: increase value by 0,25 Vibrations: decrease value by 0,25
L24	"S" Curve setting 6	25 %	Speed fluctuations: increase value by 5
L37	"I" Time I constant at high speed	0,100 s	Speed fluctuations: decrease value by 0,01 Vibrations: increase value by 0,01

6.4.3) - Low speed phase adjustments

PARAMETER	DESCRIPTION	DEFAULT	SUGGESTED ADJUSTMENTS
L38	"P" Gain constant at low speed	2,5	Motor stops: increase value by 0,25 Vibrations: decrease value by 0,25
L26	"S" Curve setting 8	25 %	Motor stops: increase value by 5
L39	"I" Time I constant at low speed	0,100 s	Motor stops: decrease value by 0,01 Vibrations: increase value by 0,01

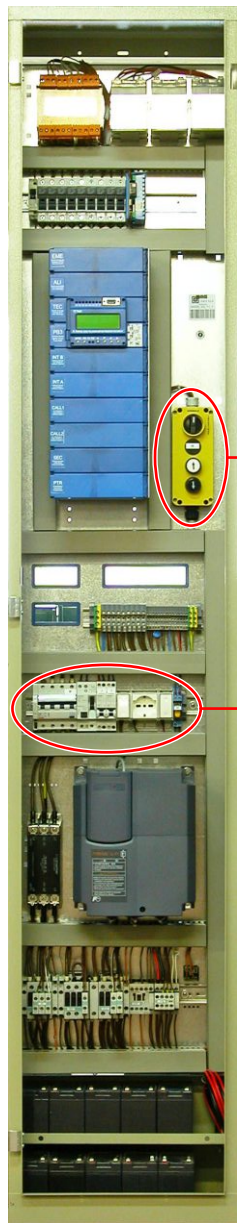
6.4.4) - Stopping phase adjustments

PARAMETER	DESCRIPTION	DEFAULT	SUGGESTED ADJUSTMENTS
F20, F21 F22, F25	DC Brake Parameters <i>Starting Speed, Braking Level, Braking Time, Stop Speed</i>	0	Do not change this value
L38	"P" Gain constant at low speed	2,5	Car unable to stay at floor: increase value by 0,25 Vibrations: decrease value by 0,25
L39	"I" Time I constant at low speed	0,100 s	Car unable to stay at floor: decrease value by 0,01 Vibrations: increase value by 0,01
H67	Stop speed holding time	0,5 s	Car unable to stay at floor: increase value by 0,25 (Max: 1,0 s) <i>Important: Enter the "Positioning" Menu and check parameters BRK- DIR (must be kept at 2 s) and Stopping Boost (set between 1% and 2%)</i>
L83	Brake Control (OFF delay time) <i>(specifies the delay time between stop speed and turning off of the brake signal)</i>	0,3 s	Larger Brakes: decrease value by 0,1 Smaller brakes: increase value by 0,1
E16	Deceleration time # 9 (<i>Last deceleration ramp</i>)	1,80 s	Increase value by 0,5 to soften last ramp (max suggested value: 3 sec)

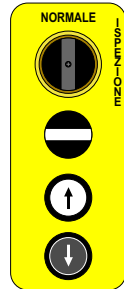
6.4.5) - Case VVVF controllers with non-encoder based positioning systems

PARAMETER	DESCRIPTION	DEFAULT	SUGGESTED ADJUSTMENTS
F24	Starting speed holding time	0,7	Set value between 0,7 and 0,8
H64	Zero speed control time	0	Set value to 0
E12	Acceleration at high speed	2	Speed fluctuations: increase value by 0,25
E13	Acceleration at low speed	2	Motor stops: increase value by 0,25
C07	Creep Speed (5-10% of high speed)		Motor stops: increase value by 0,1 Vibrations: increase/decrease value by 0,1
C11	High Speed	See Nominal Value on the motor plate	If the car is unable to keep floor level, make sure the low speed phase is performed correctly by reducing high speed C11 to half of its value to check that low speed is kept for few seconds, then slowly increase C11.

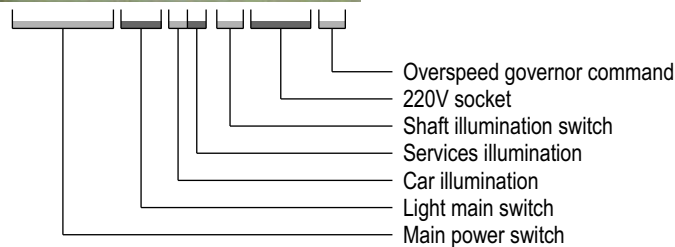
7) USE OF CONTROL PANEL ON MACHINE ROOM LESS CONTROLLER



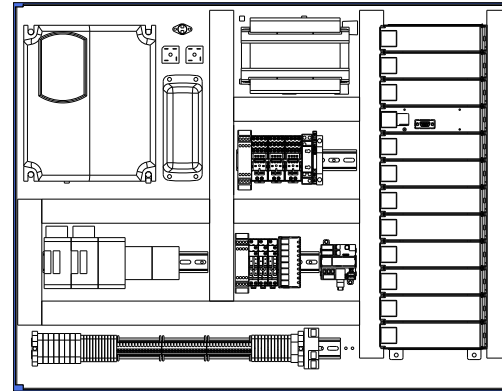
MRL
"All in one"



Emergency
Operations
Controls



MRL
Shaft box + Floor operating panel



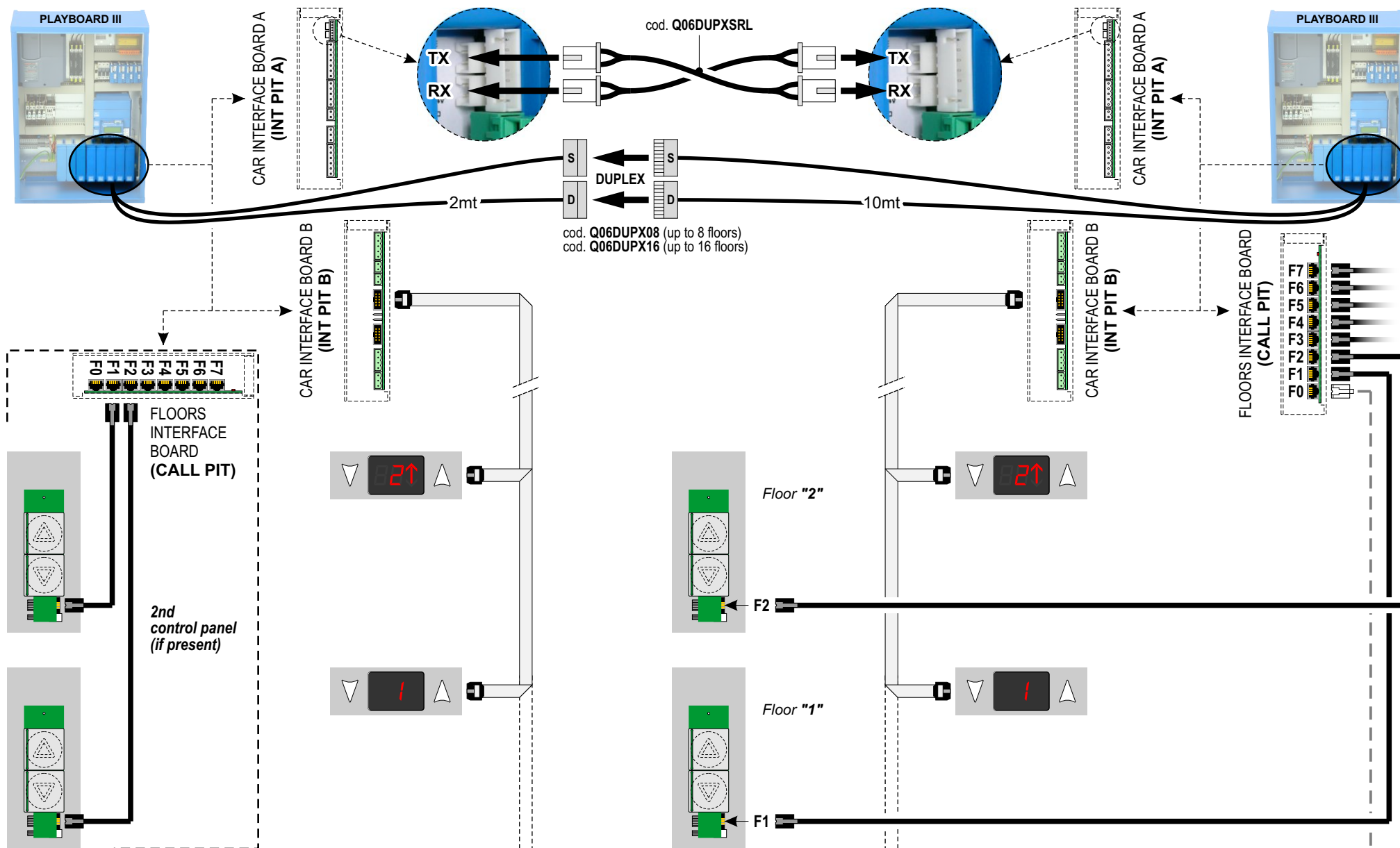
Emergency
Operations
Controls

- Main power switch (12)
- Light main switch (13)
- Car illumination (14)
- Services illumination (15)
- Thermic safety switch (16)
- Reduced-pit group command switch (17)
- Safety by-pass switch (18)
- 220V socket (19)
- Shaft illumination (20)
- Car frame illumination (21)
- Brake command (22)
- Overspeed governor command (23)

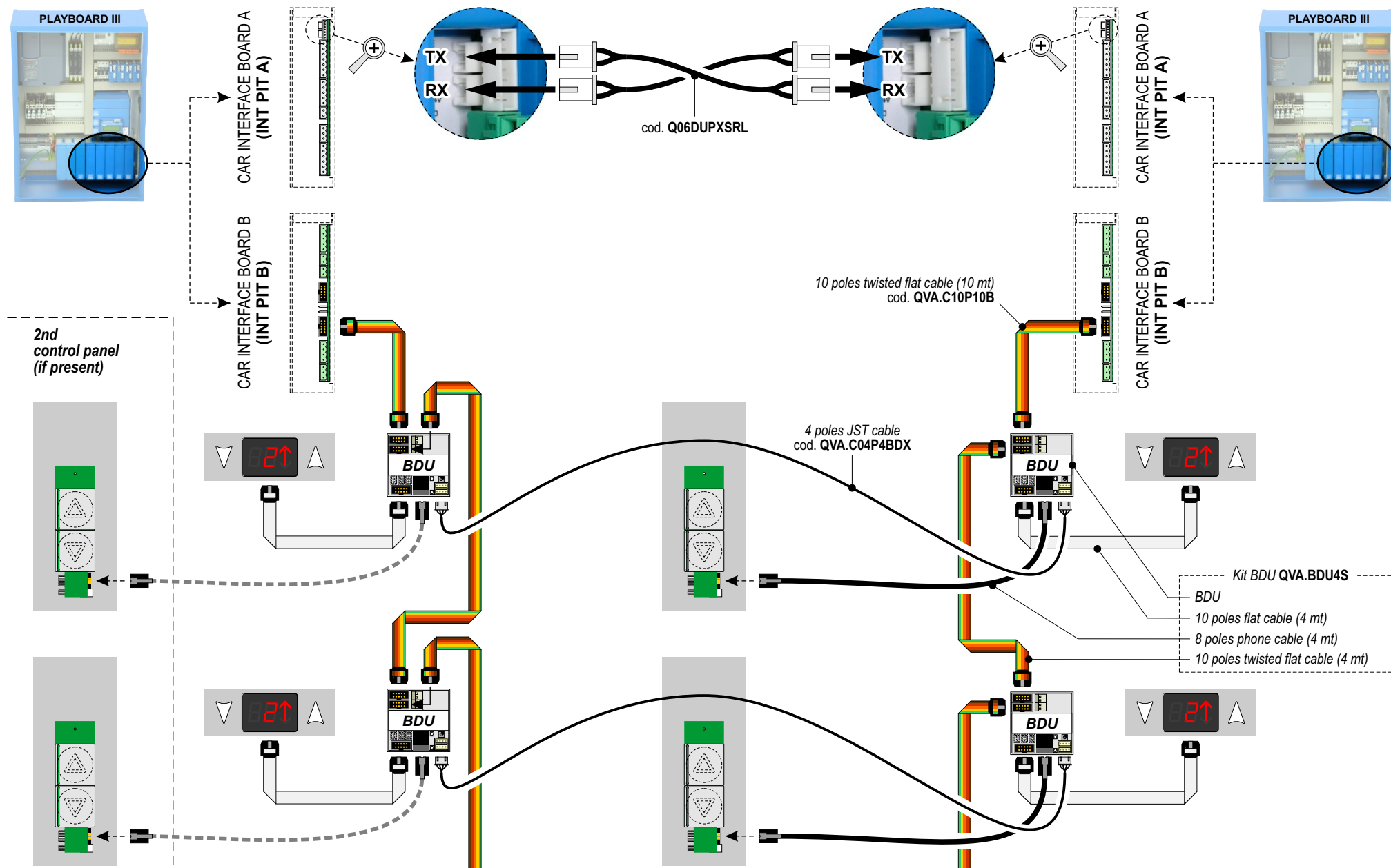


8) DUPLEX LIFT

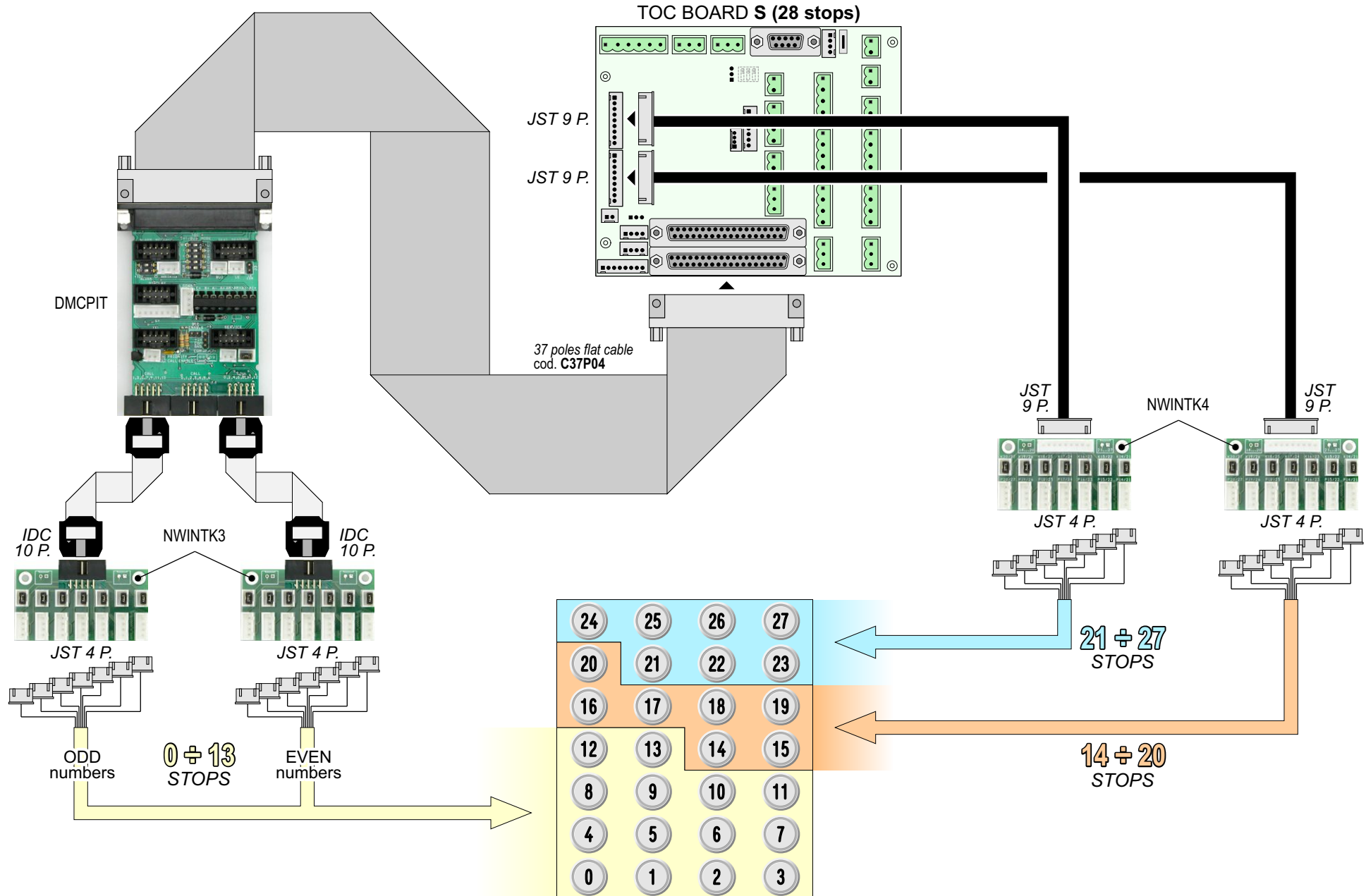
8.1) - PARALLEL COMMUNICATION (NOT SERIAL)



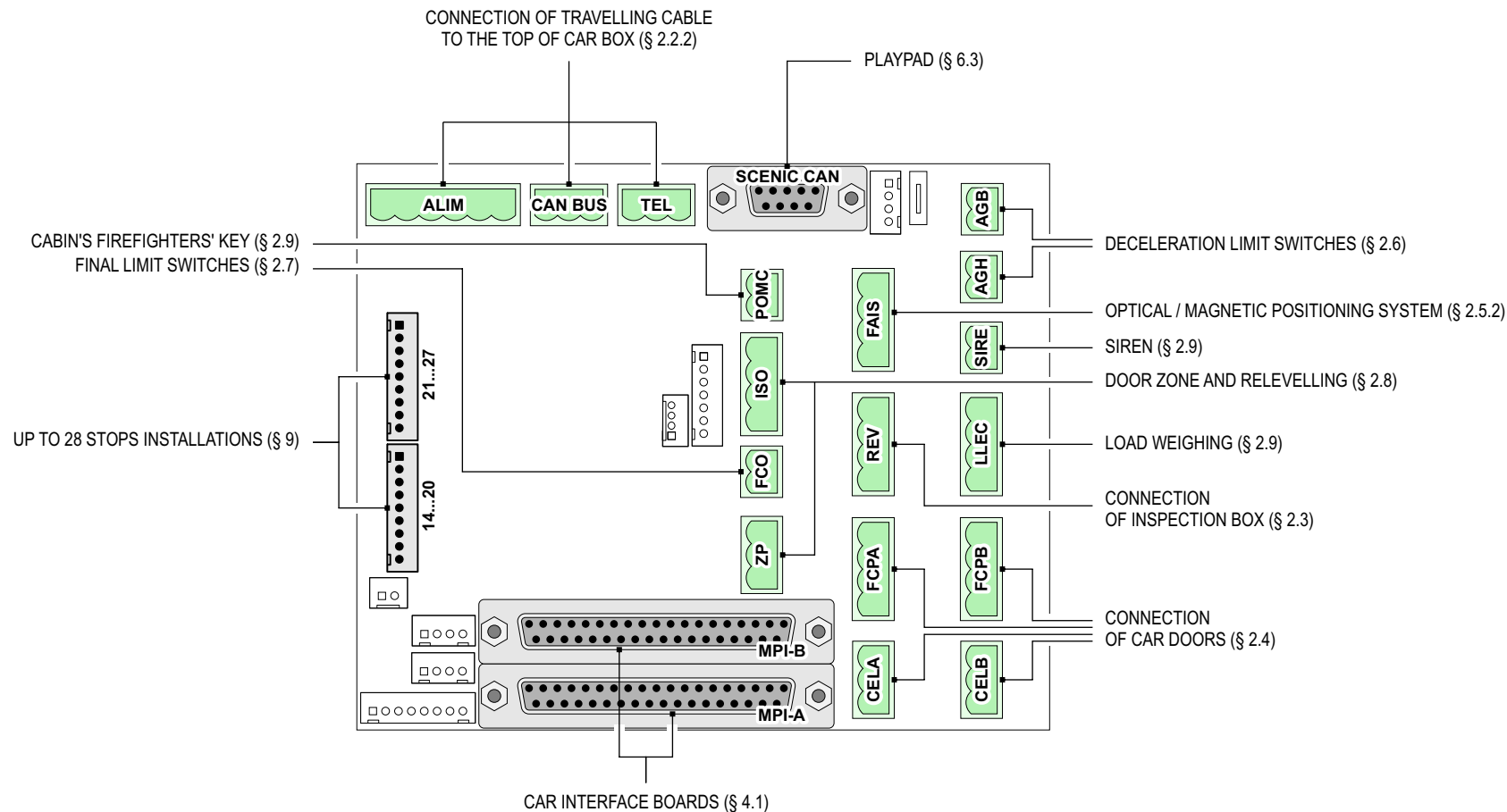
8.2) - SERIAL LINK (WITH BDU)



9) MORE THAN 14 STOPS INSTALLATIONS



APPENDIX A - New TOC board S



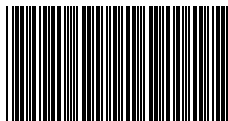


DMG SpA

Via delle Monachelle, 84/C • 00071 POMEZIA (ROMA) • ITALIA

Tel. +39 06930251 • Fax +39 0693025240

info@dmg.it • www.dmg.it



93010090