



# JUNIOR 4.0

**User Manual**

*English*

**v 1.0**





## **SAFETY WARNINGS**

### **INSTALLATION**

The control panel must be installed indoors with a pollution degree of no more than 2.

The enclosure of the control panel has an IP2X degree of protection.

The installation and maintenance of the control panel must be done by qualified and experienced personnel after careful reading of the manuals and electrical diagrams supplied with the control panel.

Electrical protection must be carried out by means of Automatic circuit breaker and earth-leakage protection coordinated with the earthing system which are the responsibility of the customer unless otherwise specifically requested.

Refer to the electrical diagram supplied with the control panel for the following protection circuits:

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

Measures for protection against electric shock:

- The control panel casing is metallic and must be connected to EARTH as indicated in the wiring diagram supplied with the control panel.
- The command and control circuits (24V) are galvanically separated from the electrical network as indicated in the electrical diagram supplied with the control panel.
- The safety circuit is galvanically separated from the electrical network as indicated in the electrical diagram supplied with the control panel.

### **MAINTENANCE**

For the maintenance of the control panel, refer to the manuals provided with the control panel and check the status of the batteries of the alarm circuits and of the return to floor circuit (if present) during the periodic inspections of the system.

For the transport and handling of the control panel, refer to the instructions on the packaging.



# JUNIOR 4.0

*User  
Manual*

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## Document References

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|--------------|------------|---------|
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## Summary

|  |  |           |
|--|--|-----------|
| <b>1.</b>  | <b>Description of PB 4.0 elevator control board.....</b>   | <b>8</b>  |
| 1.1.   | Main functions.....  | 8         |
| 1.2.   | Specifications and descriptions of inputs and outputs..... | 8         |
| 1.3.   | Integrated Programming Module .....                        | 8         |
| 1.4.   | Remote programming module .....                            | 8         |
| 1.5.   | Fusion App.....  | 8         |
| 1.6.   | Mother Board 4.0 .....                                     | 10        |
| 1.6.1.   | Controller power supply .....                              | 11        |
| 1.6.2.   | Encoder Position.....                                      | 12        |
| 1.6.3.   | Relevelling Circuit .....                                  | 12        |
| 1.6.4.   | Optional Board.....  | 12        |
| 1.6.5.   | Emergency Circuit .....                                    | 12        |
| 1.6.6.   | PME Panel.....   | 12        |
| 1.6.7.   | Parallel Signal .....                                      | 12        |
| 1.6.8.   | UCM Circuit.....   | 12        |
| 1.6.9.   | Batteries Test.....  | 13        |
| 1.6.10.  | Output Spare .....   | 13        |
| 1.6.11.  | Safety Chain .....   | 13        |
| 1.6.12.  | FUJI Analog and serial line.....                           | 13        |
| 1.6.13.  | Car at floor .....   | 14        |
| 1.6.14.  | Motor relay.....   | 14        |
| 1.6.15.  | Brake relay.....   | 14        |
| 1.6.16.  | FUJI Interface .....                                       | 14        |
| 1.7.   | Firefighters maneuvers .....                               | 15        |
| 1.8.   | Oil / Motor Temperature Control .....                      | 15        |
| 1.9.   | Weight Load Control .....                                  | 15        |
| 1.10.  | Integrated Load weighing (only for Gearless).....          | 15        |
| 1.11.  | Door Command .....   | 15        |
| 1.12.  | Protection Against Electrical Interference.....            | 16        |
| <b>2.</b>  | <b>Main Connections and Temporary Operations.....</b>      | <b>17</b> |
| <b>3.</b>  | <b>Normal Service Mode.....</b>                            | <b>18</b> |
| 3.1.1  | Fine tuning of floor stopping accuracy.....                | 18        |
| <b>4</b>   | <b>Shaft Access .....</b>                                  | <b>20</b> |
| 4.1.   | Reduced Pit Configuration (option) .....                   | 20        |
| <b>5.</b>  | <b>Changing system parameters .....</b>                    | <b>21</b> |
| 5.1  | V3 Screen Menu map .....                                   | 21        |
| 5.2  | “System status” Menu .....                                 | 22        |
| 5.3  | “Faults” Menu .....  | 23        |
| 5.4  | Menu “I/O Status” .....                                    | 24        |
| 5.5  | “Configuration” Menu .....                                 | 28        |
| 5.6  | “Doors” Menu .....   | 30        |
| 5.7  | “Signals” Menu.....  | 32        |
| 5.8  | “Special Features” Menu .....                              | 34        |
| 5.9  | “System Positioning” Menu.....                             | 37        |
| 5.10   | “VVVF” Menu .....  | 39        |
| 5.11   | “Rec Parameters” Menu .....                                | 46        |
| 5.12   | “Clock” Menu .....   | 47        |
| <b>6</b>   | <b>Troubleshooting.....</b>                                | <b>48</b> |
| <b>ANNEX II: Test and measures .....</b>                 |  | <b>61</b> |
| <b>ANNEX III: Instructions for Software update .....</b> |  | <b>64</b> |
| PlayPad (PLP) SW update procedure .....                  |  | 64        |
| Devices SW update procedure.....                         |  | 65        |

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|  |           |
|--|-----------|
| <b>ANNEX IV: VVVF Frenic Lift Setting</b> .....                        | <b>67</b> |
| Motor Tuning (VVVF Controller) .....                                   | 67        |
| VVVF Optional Boards .....   | 68        |
| VVVF Fault Table .....   | 70        |
| VVVF Alarm Sub code Table.....   | 71        |
| Motor Tuning Errors.....   | 76        |
| GEARED MOTOR .....   | 76        |
| GEARLESS MOTOR .....   | 76        |
| <b>ANNEX V: Rollback control and ride comfort</b> .....                | <b>77</b> |
| Starting phase adjustments .....                                       | 77        |
| High speed phase adjustments .....                                     | 78        |
| Stopping phase adjustments .....                                       | 78        |
| Case VVVF controllers with non-encoder based positioning systems ..... | 79        |
| <b>ANNEX VI: Emergency/Rescue Manoeuvres</b> .....                     | <b>80</b> |
| Unbalancing Rescue Operation's .....                                   | 80        |
| Electrical emergency operation .....                                   | 81        |
| <b>ANNEX VII: Control Panel</b> .....                                  | <b>82</b> |
| Single Brake Test .....  | 82        |
| Over Speed Governor Test .....   | 82        |
| <b>ANNEX VIII: UCM Circuit</b> .....                                   | <b>83</b> |
| <b>ANNEX IX: Installation Type</b> .....                               | <b>84</b> |
| <b>ANNEX XI: Fire operation programming procedure</b> .....            | <b>85</b> |
| Evacuation according to EN 81-73 .....                                 | 85        |
| <b>Annex XII: Timing Diagrams</b> .....                                | <b>87</b> |
| Installation with Inverter FUJI LM2 .....                              | 87        |

## 1. Description of PB 4.0 elevator control board

The elevator control board 4.0 is based on 32-bit electronic technology and operates all types of electric lifts. Serial and/or parallel connections to floor and car panels may be added. It is particularly suitable for VVVF electrical installations.

### 1.1. Main functions

- Control of any kind of electrical system
- Up to 7 floors
- CAN Bus serial line to connect display and serial Landing Operating Panels
- CAN Bus serial line for the serial car communication
- Lift position control by magnetic contacts
- Programming/diagnostic Interface, on board and/or remote.
- Status diagnostic, errors, failures and I/O status
- VVVF parameters and diagnostics handling (only FUJI FRENIC LIFT LM2)
- Advanced control of VVVF with speed, comfort and precision stop control
- Software upgrading via USB Device
- RS232 serial line for PC and GPRS modem connection
- Compatibility with all the +A3 solutions for electrical and hydraulic systems
- Shaft access protection

### 1.2. Specifications and descriptions of inputs and outputs

The 4.0 Mother Board contains hardware and software that allows control of the elevator and all its peripherals. Through the integrated and/or remote programming modules it allows access to all available features. Inputs and outputs are connected to all electronic and electromechanical devices in the controller and in the lift.

### 1.3. Integrated Programming Module

The Mother Board has a removable programming module that allows viewing and editing of all the basic parameters for the management and configuration of the control panel. In VVVF's version of the controller, also FUJI's parameters of the basic (menu VVVF BASE) and advanced (VVVF ADVANCED menu) configuration may be viewed and edited.

For details of the programming module operation and an extensive management system menu, see paragraph 5 below (Changing Parameters).

### 1.4. Remote programming module

An alternative way to access the configuration menu of the controller, in the view/modification mode, is by connecting the removable keypad of the DMG V3 Playboard (PlayPad), to the connector PLP V3, mounted on the Lift Control Board (see page 7).

### 1.5. Fusion App

An alternative way to access the controller is based on Fusion App.





## 1.6. Mother Board 4.0



M1 Power Supply

J16 Encoder Position

J9 Relevelling Circuit

J26 Optional Boards  
J21 Emergency Circuit

J19 PME Panel

J6 Parallel Signals

LED 1

LED 2

LED 3

LED 4

LED 5

LED 6

J18 Env. Temperature  
J12 Multiplex CAN  
J10 Light Curtain / >|<

J8 UCM Circuit  
J25 Batteries Test

J20 Out Spare  
J11 Safety Chain

J4 FUJI Analog / Serial  
J15 81-21 Circuit

J13 Car at floor  
J14 Hydro command

J22 Motor Relay  
J23 Brake Relay

FJ1 FUJI Interface

On mother board are present 6 leds for a easy diagnostic:

LED1: (Green led) not used.

LED2: (Green led) CAN Cabine termination active: led switch off when an optional board (PIT8 / 16IO / 16RL) is connected inside controller (termination automatically moves on last optional board).

LED3: (RGB led) color of this led gives info on the internal status of lift according following table:

| COLOR   | Status  |
|---------|---|
| MAGENTA | The system is in temporary operations mode  |
| WHITE   | The system is performing an emergency procedure: <ul style="list-style-type: none"> <li>• Black out Automatic evacuation or</li> <li>• Black out Manual evacuation or</li> <li>• RNO operation</li> </ul> |
| YELLOW  | The system is in maintenance mode: <ul style="list-style-type: none"> <li>• Inspection from TOC or</li> <li>• Inspection from PIT or</li> <li>• PME rom Machine room</li> </ul>                           |
| Led off | The system is performing the reset procedure  |
| BLUE    | The system is out of service cause dby: <ul style="list-style-type: none"> <li>• the car drift control procedure or</li> <li>• Water in Pit procedure</li> </ul>  |
| RED     | The system is operating an evacuation: <ul style="list-style-type: none"> <li>• Fire-fighters mode or</li> <li>• Fire Evacuation or</li> <li>• Tilt Evacuation (only for Ship)</li> </ul>                 |
| CYAN    | The system is in priority mode: <ul style="list-style-type: none"> <li>• Priority call from LOP or</li> <li>• Key Priority / VIP mode in the CAR</li> </ul>   |
| PURPLE  | The system is parked from a key <ul style="list-style-type: none"> <li>• Lift Off Mode or</li> <li>• Baggage Mode (Ship) or</li> <li>• Shuttle mode (Ship)</li> </ul>                                     |
| GREEN   | The system is in normal operation mode  |

LED4: (Yellow led) led blinks when board is running.

LED5: (Green led) led on gives the status of SE5 safety chain

LED6: (Red led):

- Led OFF means no fault active.
- Led flashing means one (or more) fault active.
- Led ON means a locking fault active.

### 1.6.1. Controller power supply

Power supply from a commercial stabilized power supplier.

The negative terminal of the power circuits and the battery charger must be connected to the ground.

Internal Clock power supply: Super Capacitor (autonomy of 5 days without power supply).

### 1.6.2. Encoder Position

Not used.

### 1.6.3. Relevelling Circuit

Circuit to make Door Safety Contact Bypass for:

- Pre opening and/or
- Relevelling

The circuit management of the re-leveling operation consists of two Safety Relays.

- **ISO output (safety relay contact)** open collector Max 24V 100mA
- **Input CCISO (Monitor ISO safety relay)** closure to GND (NC) I = 5mA
- **Input TISO (Monitor Safty module)** closure to GND (NC) I = 5mA

### 1.6.4. Optional Board

Not used.

### 1.6.5. Emergency Circuit

Circuit for complete Emergency or Evacuation with Brake opening.

### 1.6.6. PME Panel

Connection to the Control Panel inside the cabinet.

### 1.6.7. Parallel Signal

Connection to the APPO Board. It includes all parallel signals available on the Cabinet's screw terminal.

### 1.6.8. UCM Circuit

Connection to the circuit for UCM solution. Junior 4.0 has own certified solutions for managing of UCM solution in lift installations.

The UCM system consists of three parts:

- **Detector** who detects an Unintended Cabine Movement.
- **Actuator** how the braking action is implemented
- **Stopping Device** what stops the cabin.

The Stopping Device must be a certified safety device and it is the installer's responsibility to ensure the compatibility of the different elements of the UCM system.

For the functional verification of the entire system and the measurement of the spaces and intervention times, specific tests are provided to be carried out at the end of the assembly (see Appendix II).

For further information on connections and parameters see ANNEX VIII

A non-exhaustive list of the types of UCM systems and solutions most used are shown in the following table, where different applicable solutions are highlighted, each of which has its own dedicated interface and programming circuit. The interfacing with the listed devices is carried out according to the specifications indicated in the manuals of the relevant manufacturers.

When the absolute positioning system ELGO LIMAX 33CP is provided (§7), its certified UCM function is used.

| System type  | UCM system          |   |                 |
|--|---------------------|---|-----------------|
|  | Detector            | Actuator  | Stopping Device |
| Electric lift.<br>Maneuvers with open doors.                         | Junior 4.0 Gearless | Brake controls interruption (safety chain open) | Brakes (*)      |
| Ascensore a fune.<br>Over Speed Governor with anti drift device (**) | Junior 4.0 Geared   | Power interruption of the pin.                  | Safety Gear     |

(\*) solution applicable exclusively for double brakes certified as UCM stop element according to EN 81-20 5.6.7.3 and 5.6.7.4 (Gearless motors or motors with gearbox and slow shaft brake).

(\*\*) UCM certified limiters with anti-drift pin (for example Montanari RQxxx-A, PFB LKxxx with LSP coil, or similar devices).

### 1.6.9. Batteries Test

Connection to the CHAR Board. It includes the signals for

- Low Batteries;
- Phase sequence (only Hydro)
- Backup mode.

### 1.6.10. Output Spare

Generic Output used for special functions.

### 1.6.11. Safety Chain

Connection to the SECU Board. It includes the 7 points reading from the safety chain. The system is based on an opto insulated circuit connected to earth (Inside SEC Board):

- **Input SE0 ⇔ SE6 opto insulated 24 Vdc**

Above the safety circuit, a suitably sized magnetic circuit breaker( $I_{max} = 0,5 A$ ) must be provided.

SE0 is the start point of Safety chain (after DIS Protection inside the controller)

SE1 controls SHAFT STOP zone and PIT Inspection Box

SE2 controls Top of car STOP and TOC Inspection Box

SE3 controls Limit Switches, Safety Gear, Overspeed Governor

SE4 controls FLOOR PRELIMINARY LOCKS

SE5 controls FLOOR LOCKS

SE6 controls CAR DOORS and Pre Triggered's contact systems

If the limit switch, or Overspeed governor or Safety Gear is activated (safety chain point SE3 opens), the system is set out of service.

To set it back in service you must reset the SE3 error via the programming module. Obviously the safety contact of the over run final limit switch must first be reset.

### 1.6.12. FUJI Analog and serial line

Connection to the FUJI used in case of remote Inverter.

### **1.6.13. Car at floor**

Signal output from Door zone sensor for luminous signal on cabinet.

### **1.6.14. Motor relay**

Connection to the relay for Motor Contactors (or enable signals in case of Contactorless installation). It includes also the Main Contactors' monitor input.

### **1.6.15. Brake relay**

Connection to the relay for Brake Contactors (or valves in case of Hydro installation). It includes also the Brake Contactors' monitor input.

### **1.6.16. FUJI Interface**

Connection to the FUJI interface inside the inverter.

## 1.7. Firefighters maneuvers

The system has the following inputs for firefighters maneuvers:

- Input POM (floor key): closure to GND (NC / NO) I = 5mA
- Input CPOM (car key): closure to GND (NC / NO) I = 5mA

For further information on connections and parameters see ANNEX XI

## 1.8. Oil / Motor Temperature Control

In the event of the motor overheating, the contact opens and the lift is put out of service. Blocking of the lift can be immediate or when the call ends, depending on the setting.

## 1.9. Weight Load Control

When COM input is active, floor reservation calls are neither recorded nor managed.

When SUR input is active the car does not start and the acoustic signal in the car is activated. The SUR signal is ignored while driving.

## 1.10. Integrated Load weighing (only for Gearless)

In some application controller is able to detect the weight in the cabin without the need for installed load weighing devices. Available for implants only:

- Maximum load 630 Kg.
- Electric lift with VVVF Fuji LM2
- Gearless motor
- Direct or 2:1

The solution does not comply with the regulations (81.20 point 5.12.1.2.2) and therefore a risk analysis was carried out.

The function needs a Calibration procedure (§ Annex II - Test 22)



The calibration must be repeated if weight is added or removed on the counterweight or in the cabin, for example:

- adding panels, push buttons or flooring
- addition of the compensation chain

## 1.11. Door Command

The door command board can command either one or two doors with alternative, selective or passage through opening. Output and inputs are available on the screw-terminal connectors on the JTOC board. The doors can be automatic, semi-automatic or manual:

### DOOR A

- **M1 output (relay open/close door A) free contact max 24V 100mA**
- **Input BRO\_A (A door opening button relay) closed to GND (NA) I = 5mA**

### DOOR B

- **M2 output (relay open/close door B) free contact max 24V 100mA**
- **Input BRO\_B (B door opening button relay) closing to GND (NA) I = 5mA**

## 1.12. Protection Against Electrical Interference

The boards has been designed to be protected against various types of interferences, following standard/normal requirements according to the requirements of the norm, against accidental mistakes and localization. Never the less we advise that the following rules are respected:

- Connect all metal masses to ground;
- Connect all unused conductors to ground (on the side of the cabinet);
- Connect the anti-noise filters delivered with the controller (inserted in the spare parts kit) in parallel to the brake coil (max 230VDC) and as close as possible to it;
- When a retiring ramp is present, connect the anti-noise diode delivered with the controller (spare parts kit) in parallel to the retiring ramp coil and as close as possible to it; make sure to connect the cathode (diode side marked with a white strip) to the power supply positive common "CAME+" and the anode to the negative "CAME-";
- For the wiring towards the car, if signals and 24V power supply wires are present in the same travelling cable, make sure these are kept apart (safety chain circuit, doors or retiring ramp power supply, 230V etc.).
- For installations with VVVF all the instructions provided by the manufacturer must be fulfilled, regarding both the filters and the wiring. For a proper operation of the system, it is essential to use a shielded cable for connections to the motor and to the braking resistor;
- Always avoid placing signal cables in the vicinity of the power cables and / or power supply.



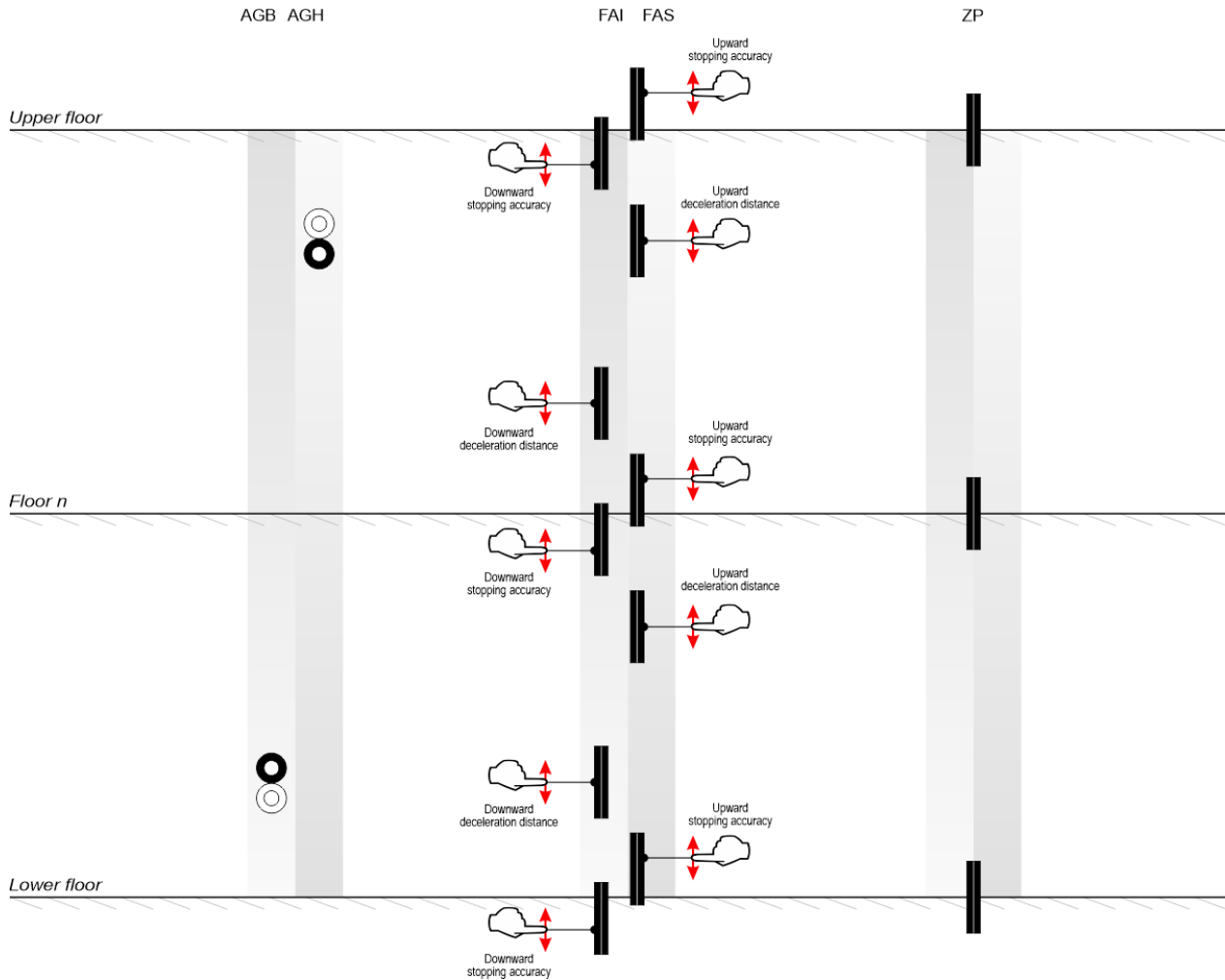
## 2. Main Connections and Temporary Operations

According to the "Temporary Operations" page of the electrical wiring diagrams schematic page:

- 1) Connect the main power supply
- 2) Connect the traction motor and Brake Resistor
- 3) Connect the brake
- 4) Connect the Motor temperature sensor
- 5) Connect the inspection box for temporary operations (Using the Temporary Cable) connecting them to the Screw terminals
- 6) Switch on main power
- 7) Carry out the Motor Tuning procedure (traction only) (Annex IV)
- 8) Install the Electrical System (Quick Installation Guide)

## 3. Normal Service Mode

Once all above procedures are completed and the functioning of all signals has been verified, it is possible to put the system into Normal Service mode.



For ride comfort improvements check ANNEX V.

### 3.1.1 Fine tuning of floor stopping accuracy

Once the self learning procedure is completed, it is possible to manually fine tune the stopping accuracy at each floor by using the PLAYPAD programming module, without having to access the shaft.

#### Regulation of stopping accuracy:

1. Make sure the installation is in the "NORMAL SERVICE" mode
2. Use the *PLAYPAD* module directly with the controller or remove it and connect it to the TOC board on the top of the cabin by using the cable (optional).
3. Enter the <Positioning> menu, select "Floor Position" parameter for the floor to be adjusted (use Left / Right keys to select the desired floor). The value displayed at the bottom of the Playpad screen indicates the current floor position (in mm) for the selected floor; press [ENTER] to modify.

4. Increase or decrease the indicated position by using UP/DOWN keys on the PLAYPAD module.
5. Press [ENTER] to save the updated value.
6. Check actual stopping accuracy by calling the lift to the selected floor. If needed, repeat steps 3, 4 and 5.
7. Repeat the procedure for every floor.

## 4 Shaft Access

Access to the shaft for systems requires that, after an access and subsequent exit from the lift shaft by an authorized person, there is a reset procedure that excludes the return to automatic operation of the lift. Below are the instructions for entering and exiting the shaft.

### 4.1.Reduced Pit Configuration (option)

#### Access in the pit

Access to the shaft is detected by opening a contact using the release key which activates the RSP fault (code 41), preventing the car from moving in normal operation (a run is only possible in 'Inspection' mode) Before entering the shaft, move the mechanical protection system in the safe condition.



After the end of Inspection operations the personnel must:

- Remove the manual protections and exit from the lift well;
- Close the landing doors (check the safety chain) and carry out the reset pressing the green button on the cabinet.

Characteristics of the auxiliary contact on door on the lowest floor:

- Monostable NC contact (does not open during normal door operation).

Key are electrically connected in series to the screw terminal of the controller.

Access on the Car roof No control required for access to the cabin roof.

## 5. Changing system parameters

### 5.1 V3 Screen Menu map

LIFT CONTROL BOARD  
DMG S.p.A.

Code ?  
\*\* Password \*\*

*If a password is used*

ENTER



Language ?  
Fr-En-Pt- \*It\*-Ru-De-NL

French  
English  
Portuguese  
Italian  
Russian  
German  
Dutch  
**ENTER:** confirm  
**ESC:** exit

Floor 0 0 :00  
<In service>

§ 5.2

Floor 0 0 :00  
<Faults>

§ 5.3

Floor 0 0 :00  
<I/O Status>

§ 5.4

Floor 0 0 :00  
<Configuration>

§ 5.5

Floor 0 0 :00  
<Doors>

§ 5.6

Floor 0 0 :00  
<Signals>

§ 5.7

Floor 0 0 :00  
<Special functions>

§ 5.8

Floor 0 0 :00  
<Positioning>

§ 5.9

Floor 0 0 :00  
<VVVF>

§ 5.10

Floor 0 0 :00  
<Rec Parameters>

§ 5.11

Floor 0 0 :00  
<Clock>

§ 5.12



After selecting the desired language  
Is necessary to perform the software  
Upgrade from (ANNEX III)

## 5.2 “System status” Menu

It is easily accessed from the main window of the PlayPad, by pressing once the ENTER key.

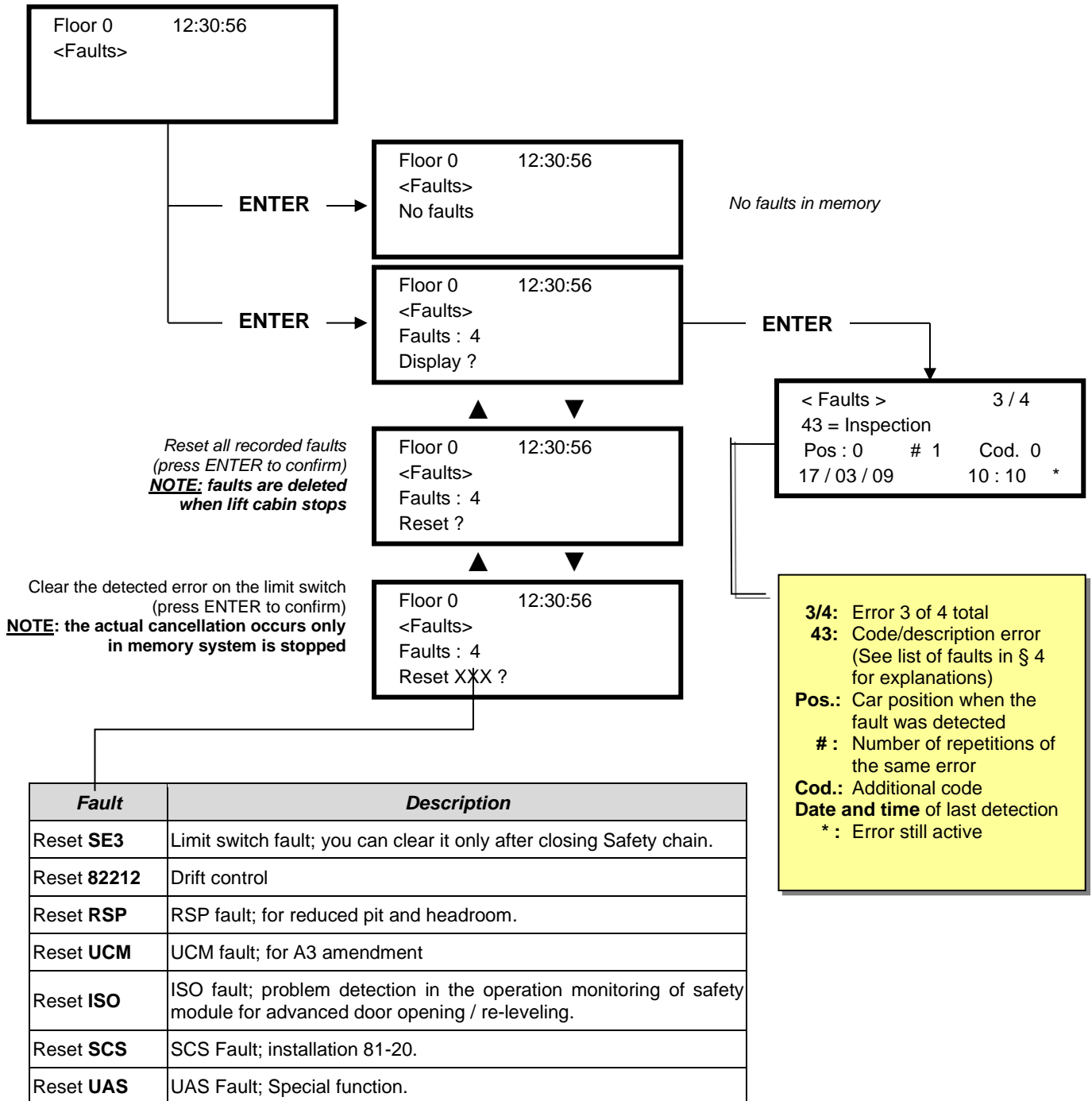
|             |          |
|-------------|----------|
| Floor 0     | 12:30:56 |
| Resetting.. |          |

| <b>System Status</b> | <b>Description</b>  | <b>Visualization on Serial display</b> |
|----------------------|---|--|
| Resetting            | The system is performing the reset procedure                          | O -                                    |
| In service           | The system is in normal operation mode                                |  |
| Inspection           | The system is in inspection mode                                      | OR                                     |
| Temp. Operat.        | The system is in temporary operations mode                            | P                                      |
| Out of service       | The system is out of service  |  |
| Car Priority         | The system is running in car priority mode (COP key switch activated) |  |
| Fire-fighters        | The system is operating in Fire-fighters mode (various operations)    |  |
| Emergency            | The system is performing the emergency procedure                      | E                                      |
| Drift control        | The system is performing the car drift control procedure              |  |
| Fire Evacuation      | The system is performing the fire evacuation                          |  |
| Water in the Pit     | The system is performing the Water in pit evacuation                  |  |
| TILT Evacuation      | The system is performing the Tilt evacuation                          |  |
| LOP Priority         | The system is running in lop priority mode (LOP key switch activated) |  |
| BAGGAGE              | The system is performing the BAGGAGE operation                        |  |
| SHUTTLE              | The system is performing the SHUTTLE operation                        |  |
| RNO                  | The system is performing the RNO procedure                            |  |
| Upward oper.         | The system is running upwards   |  |
| Downward oper.       | The system is running downwards                                       |  |
| Re-levelling         | The car is at floor level and is re-levelling                         |  |
| Still at floor       | The car is at floor level, with no registered calls                   |  |
| High speed           | The system is running in high speed mode                              |  |
| Low speed            | The system is running in low speed mode                               |  |
| Door close           | The door is completely closed   |  |
| Door open            | The door is opened (or opening/closing)                               |  |
| Car full load        | The car has been fully loaded   |  |
| Photocell A          | The input relevant to the photocell entrance A is active              |  |
| Photocell B          | The input relevant to the photocell entrance B is active              |  |
| BRA button           | The input relevant to the open door button of entrance A is active    |  |
| BRB button           | The input relevant to the open door button of entrance B is active    |  |
| Active fault         | There is some active faults   |  |

## 5.3 "Faults" Menu

This Menu lists the last 60 faults stored into the internal memory of the controller. All faults are described in the Troubleshooting section (§ 6).

**WARNING:** In case of black out, the internal memory is saved only if the battery is connected.




## 5.4 Menu "I/O Status"



Table of Parameters

| Field                | Description  | Navigation   | Values (group of 12) |                      |               |                         |                |
|----------------------|--|--|----------------------|----------------------|---------------|-------------------------|----------------|
| Car call             | Simulation of a car call   | ▲▼ Select floor<br>ENTER Confirm<br>ESC Exit             |                      |                      |               |                         |                |
| <br>Playboard IN-OUT | <b>System Inputs/Output</b><br><input type="checkbox"/> = Open contact<br><input checked="" type="checkbox"/> = Closed Contact             | ▲▼ Change group<br>ENTER Exit<br>ESC Exit                | GROUPS               |                      |               |                         |                |
|                      |  |  | 1/9                  | REM VHS SUR          | RED TH1 COM   | REV TH2 LE              | REV1 REV2 LTMP |
|                      |  |  | 2/9                  | RMO BRK RDE          | RGV RMV RPV   | MTR YBRK CCF            | CCO CCOB       |
|                      |  |  | 3/9                  | BRA FOA ROA          | CEA FFA RFA   | BRB FOB ROB             | CEB FFB RFB    |
|                      |  |  | 4/9                  | HS BFR OTM           | PCA           | POM RPH J20             | CPOM IEME OEME |
|                      |  |  | 5/9                  | FLM FLD              | BIP GNGM GNGD | 511B 511L               | DSA 212B E511  |
|                      |  |  | 6/9                  | PWR ENAB             | IN_A IN_D     | BR1 BYPL                | BR2 BYPC       |
|                      |  |  | 7/9                  | FAI ZP               | FAS TISO      | CAM ISO                 | AGH AGB CISO   |
|                      |  |  | 8/9                  | REM REM1 REM2        | RED RED1 RED2 | PME OVS                 | REV REV1 REV2  |
|                      |  |  | 9/9                  | L-RED L-GREEN BUZZER |               | GPIO1<br>GPIO2<br>GPIO3 |                |
| <br>VVVF IN-OUT      | <b>VVVF Inputs/Output</b><br><input type="checkbox"/> = Open contact<br><input checked="" type="checkbox"/> = Closed Contact               | ▲▼ Change group<br>ENTER Exit<br>ESC Exit                | GROUPS               |                      |               |                         |                |
|                      |  |  | 1/8                  | EN FWD REV           | X1 X2 X3      | X4 X5 X6                | X7 X8 0,0 V    |
|                      |  |  | 2/8                  | Y1 Y5A/C             | Y2            | Y3 30 A/B/C             | Y4             |
|                      |  |  | 3/8                  | BUSY ACC DEC         | ALM INT BRK   | EXT NUV RL              | TL VL IL       |
|                      |  |  | 4/8                  | Fout =               | 0,00 Hz       |                         |                |
|                      |  |  |                      | lout =               | 0,00 A        |                         |                |
|                      |  |  |                      | Vout =               | 0,00 V        |                         |                |
|                      |  |  | 5/8                  | Fref =               | 0,00 Hz       |                         |                |
|                      |  |  |                      | EDC NST              | ---V ---      | TRQ TIME                | --% --- h      |
|                      |  |  | 6/8                  | Imax =               | 0,00 A        |                         |                |
|                      | Encoder  | 0  | P/s                  |                      |               |                         |                |
|                      | ---  | kW   | MAIN =               |                      |               |                         |                |
| 7/8                  | Fault VVVF   |  |                      |                      |               |                         |                |
|                      | 0=   | ---  | 1=                   | ---                  |               |                         |                |
|                      | 2=   | ---  | 3=                   | ---                  |               |                         |                |
| 8/8                  | I-bal  | 0,00   | A                    |                      |               |                         |                |
|                      | I-com  | 0,00   | A                    |                      |               |                         |                |
|                      | I-sur  | 0,00   | A                    |                      |               |                         |                |
| <br>Push buttons     | <b>Status of call buttons</b><br><input type="checkbox"/> = button not activated<br><input checked="" type="checkbox"/> = button activated | ▲▼ Change group<br>cab/down/up<br>ENTER Exit<br>ESC Exit | GROUPS               |                      |               |                         |                |
|                      |  |  | Cabin side A         | 7 3                  | 6 2           | 5 1                     | 4 0            |
|                      |  |  | Cabin side B         | 7 3                  | 6 2           | 5 1                     | 4 0            |
|                      |  |  | Pushb. Down side A   | 7 3                  | 6 2           | 5 1                     | 4 0            |
|                      |  |  |                      | 7 3                  | 6 2           | 5 1                     | 4 0            |



|           |  |  |   |  |   |   |              |  |  |  |
|-----------|--|--|---|--|---|---|--------------|--|--|--|
|           |  |  | Pushb. Down side B  | 7<br>3   | 6<br>2  | 5<br>1  | 4<br>0       |  |  |  |
|           |  |  | Upward side A   | 7<br>3   | 6<br>2  | 5<br>1  | 4<br>0       |  |  |  |
|           |  |  | Upward side B   | 7<br>3   | 6<br>2  | 5<br>1  | 4<br>0       |  |  |  |
| Cards AUX | <b>Cards AUX Inputs/Output</b><br><input type="checkbox"/> = Open contact<br><input checked="" type="checkbox"/> = Closed Contact<br><br>(x.yz<br>x=card, yz=contact on board) | ▲▼ Change page<br>ENTER Exit<br>ESC Exit | CARDS 16 IO IN  |  |   |   |              |  |  |  |
|           |  |  | 1/12  | 1.08<br>1.04   | 1.07<br>1.03  | 1.06<br>1.02  | 1.05<br>1.01 |  |  |  |
|           |  |  | 2/12  | 1.16<br>1.12   | 1.15<br>1.11  | 1.14<br>1.10  | 1.13<br>1.09 |  |  |  |
|           |  |  | 3/12  | 2.08<br>2.04   | 2.07<br>2.03  | 2.06<br>2.02  | 2.05<br>2.01 |  |  |  |
|           |  |  | 4/12  | 2.16<br>2.12   | 2.15<br>2.11  | 2.14<br>2.10  | 2.13<br>2.09 |  |  |  |
|           |  |  | CARDS 16 IO OUT   |  |   |   |              |  |  |  |
|           |  |  | 5/12  | 1.08<br>1.04   | 1.07<br>1.03  | 1.06<br>1.02  | 1.05<br>1.01 |  |  |  |
|           |  |  | 6/12  | 1.16<br>1.12   | 1.15<br>1.11  | 1.14<br>1.10  | 1.13<br>1.09 |  |  |  |
|           |  |  | 7/12  | 2.08<br>2.04   | 2.07<br>2.03  | 2.06<br>2.02  | 2.05<br>2.01 |  |  |  |
|           |  |  | 8/12  | 2.16<br>2.12   | 2.15<br>2.11  | 2.14<br>2.10  | 2.13<br>2.09 |  |  |  |
|           |  |  | CARDS 16 RL   |  |   |   |              |  |  |  |
|           |  |  | 9/12  | 1.08<br>1.04   | 1.07<br>1.03  | 1.06<br>1.02  | 1.05<br>1.01 |  |  |  |
|           |  |  | 10/12   | 1.16<br>1.12   | 1.15<br>1.11  | 1.14<br>1.10  | 1.13<br>1.09 |  |  |  |
|           |  |  | 11/12   | 2.08<br>2.04   | 2.07<br>2.03  | 2.06<br>2.02  | 2.05<br>2.01 |  |  |  |
|           |  |  | 12/12   | 2.16<br>2.12   | 2.15<br>2.11  | 2.14<br>2.10  | 2.13<br>2.09 |  |  |  |
|           |  |  | BDU Inputs  | <b>BDU Inputs</b><br><input type="checkbox"/> = Open contact<br><input checked="" type="checkbox"/> = Closed Contact                     | ▲▼ Change page<br>◀▶ Change group<br>ENTER Exit<br>ESC Exit | Group: Door, Fire, Key 1, Key 2, Key 3, Key 4.<br>For each group, the status of the contact is displayed for each plan  |              |  |  |  |
|           |  |  | <br>Call registration list | <b>Call registration list</b><br><input type="checkbox"/> = call not registered<br><input checked="" type="checkbox"/> = call registered | ▲▼ Change group<br>◀▶ cab/down/up<br>ENT/ESC Exit           | Same Groups as PUSHBUTTONS  |              |  |  |  |
|           |  |  | [0] Start = ...<br>[1] Start = ...<br>[2] Start = ...   | Run Counters<br>[0] partial (resettable)<br>[1] Total<br>[2] Future use  | ◀▶ Change<br>ENTER Reset and exit<br>ESC Exit               | Date showed is referred to the last reset of partial counter [0]  |              |  |  |  |
|           |  |  | Analogic  | Analogic measures  | ◀▶ Change page<br>ESC Exit                                  | 24 V = Power Supply<br>VCAB = Cabinet anc Cabine absorptions<br>VMR = BDU absorptions<br>24VB = Batteries Voltage<br>+5.0 V = Board Internal power supply<br>TAMB = Ambient temperature sensor<br>PWM = Analogic speed output |              |  |  |  |
|           |  |  | TOC Measures  | Analogic measures  | ◀▶ Change page<br>ESC Exit                                  | T_SHA = Shaft temperature<br>MAIN = TOC Power Supply<br>COP_A = COP side A absorptions<br>COP_B = COP side B absorptions  |              |  |  |  |

|              |                                 |                                  |                              |  |
|--------------|---------------------------------|----------------------------------|------------------------------|--|
| COP Measures | Analogic measures               | ◀▶<br><b>ESC</b>                 | Change page<br>Exit          | MAIN_A = COP A power supply<br>MAIN_B = COP B power supply<br>T_CAR = Cabine temperature   |
| FLOORS Line  | BDU<br>Communication Line       | <b>ENTER</b><br><b>ESC</b>       | Reset<br>Exit                | Error: Communications error number<br>FER: Frame Error Rate<br>Date and hour of last reset |
| CAR Line     | TOC / COP<br>Communication Line | <b>ENTER</b><br><b>ESC</b>       | Reset<br>Exit                | Error: Communications error number<br>FER: Frame Error Rate<br>Date and hour of last reset |
| MTPX Line    | MULTIPLEX<br>Communication Line | ▲▼<br><b>ENTER</b><br><b>ESC</b> | Change page<br>Reset<br>Exit | Error: Communications error number<br>FER: Frame Error Rate<br>Date and hour of last reset |
| ELGO model:  | ELGO's Diagnostic               |                                  |                              |  |

PLAYBOARD IN-OUT table description parameters

| <b>Input</b> | <b>Description</b>   | <b>Input</b>        | <b>Description</b>  |
|--------------|--|---------------------|---|
| SE0          | Safety chain Start   | REV<br>REV1<br>REV2 | Inspection function (machine room)<br>Inspection function (Top of Car)<br>Inspection function (PIT) |
| SE1          | Safety chain pit safety contacts                               | REM<br>REM1<br>REM2 | Inspection up (machine room)<br>Inspection up (Top of Car)<br>Inspection up (PIT)                   |
| SE2          | Safety chain top of car inspection Box/Stop                    | RED<br>RED1<br>RED2 | Inspection down (machine room)<br>Inspection down (Top of Car)<br>Inspection down (PIT)             |
| SE3          | Safety chain final limit switch, safety gear, speed governor   | TH1<br>TH2          | Motor (Oil) temperature sensor control  |
| SE4          | Safety chain hall doors preliminary contacts                   | IEME                | Emergency (power supply failure)  |
| SE5          | Safety chain hall doors inerlocks                              | PME                 | PME selector (emergency evacuation)   |
| SE6          | Safety chain car doors contacts and pre trigger device (81-21) | AGH<br>AGB          | Top deceleration switch<br>Bottom deceleration switch   |
| CCO<br>CCOB  | power contactors control                                       | FAS<br>FAI          | Position Sensors (no encoder positioning system)  |
| CISO         | Monitor ISO relay  | E511                | Optional input for <i>Shaft Access</i>  |
| TISO         | Safety Module SM1 control                                      | BYPL<br>BYPC        | Door's safety Bypass selector   |
| LE           | Emergency Light (car light power supply)                       | BRA                 | Door open button (entrance A)   |
| BFR          | door close button  | CEA                 | Photocell entrance A  |
| PCA          | car priority function  | FOA                 | Door open limit switch entrance A   |
| POM          | Fire-fighters operations (Hall key switch)                     | FFA                 | Door close limit switch entrance A  |
| CPOM         | Fire-fighters operations (Car key switch)                      | BRB                 | Door open button (entrance B)   |
| SUR          | Overload control   | CEB                 | Photocell entrance B  |
| COM          | Full load control  | FOB                 | Door open limit switch entrance B   |
| HS           | out of service function  | FFB                 | Fine corsa chiusura (Porta B)   |
| ZP           | door zone signal   | BR1                 | Brake 1 monitor switch  |
| RPH          | Phase sequence control   | BR2                 | Brake 2 monitor switch  |
|              |  | IN_A                | Monitor UCM circuit   |
|              |  | IN_D                | Monitor UCM circuit   |

| <b>Output</b> | <b>Description</b>                  | <b>Output</b> | <b>Description</b>            |
|---------------|-------------------------------------|---------------|-------------------------------|
| VHS           | Output - out of order illumination  | DSA           | Output - alarms de-activation |
| RMV           | Output - intermediate speed command | 511B          | Output - Norm 511 Buzzer      |

| Output | Description                             | Output  | Description                              |
|--------|---|---------|--|
| BRK    | Output - Brake command                  | 511L    | Output - Norm 511 Light                  |
| MTR    | Output - Motor command                  | 212B    | Output - Norm 212 Buzzer                 |
| YBRK   | Output - Brake command (VVVF)           | FLD     | Output - down arrows command             |
| ISO    | Output - Re-levelling command           | FLM     | Output - up arrows command               |
| RGV    | Output - high speed command             | GNGD    | Output - upward gong command             |
| RPV    | Output - low speed command              | GNGM    | Output - downward gong command           |
| RMO    | Output - up travel command              | BIP     | Output - BIP signalization in the cabin  |
| RDE    | Output - down travel command            | PWR     | UCM module power command                 |
| LTMP   | Output - time limited car light command | ENAB    | UCM module enabling command              |
| CAM    | Output - retiring ramp command          | ROA     | Output - door open command (entrance A)  |
| OEM    | Output - emergency command              | RFA     | Output - door close command (entrance A) |
| CCF    | Output - Motor phase short Circuit      | ROB     | Output - door open command (entrance B)  |
|        |   | RFB     | Output - door close command (entrance B) |
|        |   | L-RED   | Traffic Light signal 81-20/21            |
| J20    | Output - programmable (connector J20)   | L-GREEN | Traffic Light signal 81-20/21            |
|        |   | BUZZER  | Buzzer signal for bypass 81-20           |

VVVF IN-OUT table description parameters

| Signal  | Description                                  | Signal           | Description                        |
|---------|--|------------------|------------------------------------|
| EN      | enable digital input (screw terminal EN)     | Y1               | Digital output (terminal Y1)       |
| FWD     | Upward digital input (screw terminal FWD)    | Y2               | Digital output (terminal Y2)       |
| REV     | Downward digital input (screw terminal REV)  | Y3               | Digital output (terminal Y3)       |
| X1      | High speed digital input (screw terminal X1) | Y4               | Digital output (terminal Y4)       |
| X2      | REV speed digital input (screw terminal X2)  | Y5A/C            | Brake command relays (terminal Y5) |
| X3      | Low speed digital input (screw terminal X3)  | 30 A/B/C         | Relè (terminal 30 A/B/C)           |
| X4      | Ingresso digitale (morsetto X4)              | ALM              | Alarm VVVF signalisation           |
| X5      | digital input (screw terminal X4)            | RST              | Reset VVVF                         |
| X6      | Ingresso digitale (morsetto X6)              | ACC              | Acceleration                       |
| X7      | Ingresso digitale (morsetto X7)              | DEC              | Deceleration                       |
| X8      | Emergency digital input (screw terminal X8)  | Fout             | Output Frequency                   |
| 0,0 V   | VVVF analog input (terminals 11-12)          | Vout             | Output Voltage                     |
| Encoder | Encoder VVVF input (closed loop)             | Iout             | Output current                     |
| MAIN    | VVVF firmware version                        | I <sub>max</sub> | Maximum output current             |

## 5.5 "Configuration" Menu

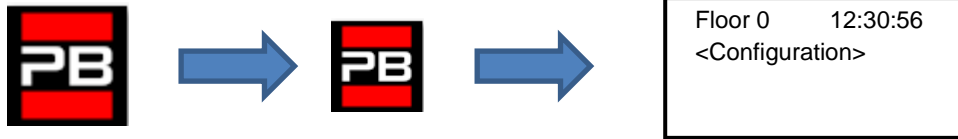
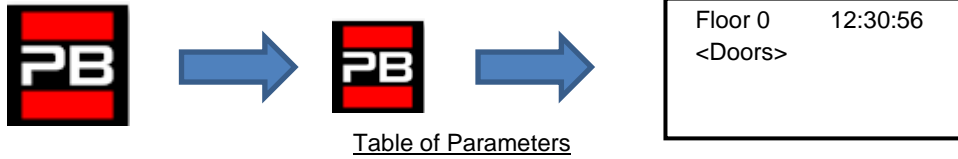


Table of Parameters

| Parameter            | Description  | Navigation |                                    | Values  | Default value         |
|----------------------|--|------------|------------------------------------|---|-----------------------|
| Temporary operations | Temporary operations mode of the system  | ◀▶         | Choice                             | No;<br>Yes  | No                    |
| Test                 | To ease checks and installation start-up.<br>For description, refer to Annex II.   | ▲▼         |                                    |   |                       |
| Code ?               | Password protection to access programming  | ◀▶<br>▲▼   | Change charact.<br>Select charact. | 8 characters<br>(0 - 9; A - Z; a - z)   | no<br>password        |
| Configuration        | Type of wiring configuration:<br>-) Standard wire terminals (Car and floors);<br>-) Serial comm. in the car, 1 line/floor connectors at floors;<br>-) Wire terminals in the car, Serial communication at floors (BDU modules);<br>-) Serial communication for car and floors   | ◀▶         | Choice                             | Car & Fl. STD;<br>Car SER. / Fl. RJ45;<br>Car STD. / Fl. BDU;<br>Car SER. / Fl. BDU         | Car SER /<br>Fl. RJ45 |
| Type of control      | Type of control for the lift   | ◀▶         | Choice                             | -SAPB;<br>-SAPB record<br>-SAPB constant pressure<br>-Down collective;<br>-Full Collective; | SAPB;                 |
| Drive                | Traction type:<br>-) Traction VVVF<br>-) Hydraulic – Motor Direct (Dir): can be used also in case of VVF activated only in UP direction.<br>-) Hydraulic – Motor Soft Starter (S-S):<br>-) Hydraulic – Motor Star Delta (Y-D):<br>-) Hydraulic – Motor with Inverter (VVF): Motor contactors activated in UP and DOWN direction.   | ◀▶         | Choice                             | Traction<br>Hydraulic Dir<br>Hydraulic S-S<br>Hydraulic Y-D<br>Hydraulic VVF                | Traction              |
| No. of floors        | Number of floors of the installation   | ▲<br>▼     | Increase<br>Decrease               | 2 <-> 16 (std.)<br>2 <-> 32 (BDU only)  | 2                     |
| Re-levelling         | <b>Not present:</b> No Re-levelling<br><b>Type 1:</b> (open or close door). This setting is indicated for traction installations for good stopping accuracy. Re-levelling is triggered when the car leaves its position "perfectly at floor" that's to say when one of the two beams interrupted. Re-levelling ends when both beams are free. <b>WARNING:</b> this setting is not suitable for hydraulic installations due to the risk of "pumping" effect (car drifts down after stopping)<br><b>Type 2:</b> (open or close door). This setting is indicated for hydraulic installations and operates as in Type 1, except that the two beams must be interrupted before the re-levelling starts. Re-levelling ends when the two beams are free. <b>WARNING:</b> the use of sensors with reduced distance between beams (TMS03 = 20 mm) is suggested.<br><b>Type 3:</b> Levelling 1 beam open door 2 beams closed door. This setting allows the levelling 1 beam, floor door open (car light on) and levelling 2 beams, floor door closed (car light off). <b>WARNING:</b> to operate the levelling door open, no matter which option you have chosen, it is necessary to shunt the door safety, using an approved system.<br><b>Note:</b> with the Encoder positioning system, distance of activation of the re-levelling is displayed | ◀▶         | Choice                             | Not present<br>Type 1<br>Type 2<br>Type 3   | Not<br>present        |
| Main floor           | Position of the main floor (all calls below this floor are served only upwards (only down collective)  | ▲<br>▼     | Increase<br>Decrease               | 0 <-> Floor No.   | 0                     |
| Low Speed fault time | Time before activation of the Low Speed fault (low speed too long)   | ▲<br>▼     | Increase<br>Decrease               | 7 s <-> 40 s  | 7 s                   |
| Running time         | Time before activation of running time fault   | ▲<br>▼     | Increase<br>Decrease               | 20 s <-> 45 s   | 20 s                  |

| Parameter               | Description  | Navigation |                               | Values   | Default value   |
|-------------------------|--|------------|-------------------------------|--|-----------------|
| Calls from 16IO         | <p>Special Features to use screw terminal interface by 16IO board instead of Prewired COP board (DMCPIT) when you have partial modernization.</p> <p>The Interface can be used</p> <ul style="list-style-type: none"> <li>- on single board on the first (16IO I option) or on the second (16IO II option) interface board managing up to 12 floors</li> <li>- on two interfaces (16IO I+II option) managing up to 28 floors.</li> </ul> <p><b>NOTE:</b> This option could be not compatible if 16IO board is used for other functions</p> | ◀▶         | Choice                        | Disabled;<br>16IO I;<br>16IO II;<br>16IO I+II;   | Disabled        |
| Type of Installation    | Type of installation (Simplex / Multiplex / Multiplex LIGHT)<br>Multiplex LIGHT has a shared single BDU line for two lifts with a dedicated sinalization's wiring.   | ◀▶         | Choice                        | Simplex;<br>Multiplex;<br>Multiplex LIGHT        | Simplex         |
| Multiplex configuration | Multiplex configuration: Lift No.(LN); Push-Buttons Line (PBL); Floors in multiplex; Offset.<br>For description, refer to Appendix I.  | ◀▶<br>▲▼   | Select param.<br>Change value | - Lift No (LN): 1<->4                            | (LN).(PBL): 1.0 |
|                         |  |            |                               | - PushButtons Line (PBL): 0(1 Line)<->3(4 Lines) |                 |
|                         |  |            |                               | - Floors: 2 <-> 16 [32]                          | Firs. : 2       |
|                         |  |            |                               | - Ofst 0 <-> N° floors                           | Ofst : 0        |
| Multiplex Call          | <p>In multiplex installations a floor call can be differentiated with a long push-button pressure (more than 3 seconds) calling:</p> <ul style="list-style-type: none"> <li>a) The installation with lower "Lift No (LN)" parameter (for example if there is a duplex installation with a big cabin for disabled passengers and a smaller one, the greater must be set as "1" and the other as "2";</li> <li>b) In an "asymmetric floor distribution" system, the installation that can reach the lowest/highest level.</li> </ul>         | ◀▶         | Choice                        | No (0, 1, 2, 3);<br>Yes (0, 1, 2, 3)             | No              |

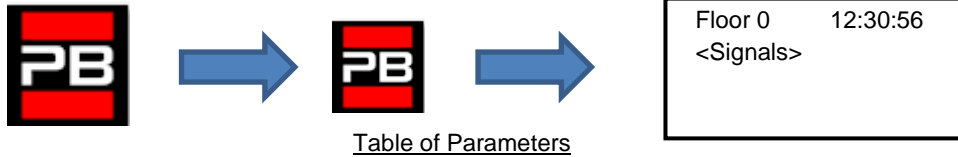
## 5.6 "Doors" Menu



| Cod. | Parameter                   | Description   | Navigation                      | Values   | Default value    |
|------|-----------------------------|---|---------------------------------|--|------------------|
|      | Ret. ramp on                | Time before activation of the retiring ramp   | ▲ Increase<br>▼ Decrease        | 0,1 s <-> 9,9 s  | 0,1 s            |
|      | Ret. ramp off               | Time before deactivation of the retiring ramp   | ▲ Increase<br>▼ Decrease        | 0,1 s <-> 9,9 s  | 0,1 s            |
|      | Lock fault time             | Time before the activation of the lock fault  | ▲ Increase<br>▼ Decrease        | 2 s <-> 60 s   | 15 s             |
|      | Door open delay             | Time before door opening – for automatic door   | ▲ Increase<br>▼ Decrease        | 0,1 s <-> 9,9 s  | 0,5 s            |
|      | Parking time with open door | Lift car parking time with open door (in sec.)  | ▲ Increase<br>▼ Decrease        | 1 s <-> 30 s   | 7 s              |
|      | Closing time with calls     | Time (in sec.) before door closes in case of registered calls   | ▲ Increase<br>▼ Decrease        | 1 s <-> 60 s   | 2 s              |
|      | Doors Nb.                   | Number and type of doors  | ◀▶ Selection                    | -1 door<br>-2 doors simult.<br>-2 doors sel.<br>-2 doors sel+through         | 1 access         |
|      | Type Door A                 | Selection of door type for entrance A:<br>1) <i>Manual / Not present</i> : manual doors at floors, car doors manual or not present;<br>2) <i>Car independent</i> : manual doors at floors, car doors independent;<br>3) <i>Car automatic</i> : manual doors at floors, car doors automatic;<br>4) <i>Combined auto</i> : automatic doors in the car and at floors | ◀▶ Selection                    | Manual / not present;<br>Car Independent;<br>Car automatic;<br>Combined Auto | Combined Auto    |
|      | Door A with limit switch    | Presence of a limit switch for door A (not present for manual and independent doors)  | ◀▶ Selection                    | No;<br>Yes NO<br>Yes NC  | No               |
|      | Select door A at floor      | Configuration of door A for each floor: set access to each floor and open or close door parking at floor (for automatic doors)  | ◀▶ Selection<br>▲▼ Change floor | No;<br>Not enable<br>Pkg. Door close;<br>Pkg. Door open                      | Pkg. Door close; |
|      | Door A Open/Close time      | Door A without limit switch: door opening/closing time  | ▲ Increase<br>▼ Decrease        | 1 s <-> 60 s   | 10 s             |
|      | Door A start delay          | Door A manual: time before start  | ▲ Increase<br>▼ Decrease        | 0,1 s <-> 9,9 s  | 2,0 s            |
|      | Slipping Door A             | Door A with limit switch: time before slipping fault  | ▲ Increase<br>▼ Decrease        | 1 s <-> 60 s   | 10 s             |
|      | Door A powered              | Door A powered during the run. Not considered for manual or independent doors   | ◀▶ Selection                    | No<br>Yes<br>Yes AT40  | No               |
|      | Type Door B                 | Selection of door type for entrance B (see Type Door A):  | ◀▶ Selection                    | Manual / not present;<br>Car Independent;<br>Car automatic;<br>Combined Auto | Combined Auto    |
|      | Door B with limit switch    | Presence of a limit switch for door A (not present for manual and independent doors)  | ◀▶ Selection                    | No;<br>Yes   | No               |
|      | Select door B at floor      | Configuration of door A for each floor: set access to each floor and open or close door parking at floor (for automatic doors)  | ◀▶ Selection<br>▲▼ Change floor | No;<br>Pkg. Door close;<br>Pkg. Door open                                    | Pkg. Door close  |
|      | Door B Open/Close time      | Door B without limit switch: door opening/closing time  | ▲ Increase<br>▼ Decrease        | 1 s <-> 60 s   | 10 s             |

| Cod. | Parameter          | Description  | Navigation               | Values                | Default value |
|------|--------------------|--|--------------------------|-----------------------|---------------|
|      | Door B start delay | Door B manual: time before start   | ▲ Increase<br>▼ Decrease | 0,1 s <-> 9,9 s       | 2,0 s         |
|      | Slipping Door B    | Door B with limit switch: time before slipping fault   | ▲ Increase<br>▼ Decrease | 1 s <-> 60 s          | 10 s          |
|      | Door B powered     | Door B powered during the run. Not considered for manual or independent doors  | ◀▶ Selection             | No<br>Yes<br>Yes AT40 | No            |
|      | Advanced opening   | Parameter for door advanced opening (opening starts before car stop).  | ◀▶ Selection             | No;<br>Yes            | No            |
|      | Photocell Type     | Parameter to select the type of photocell:<br><b>NO photocell:</b> contact opens if the beam is free. The contact closes if the beam is interrupted. The shock, photocell and open door contacts must be wired in parallel.<br><b>NC photocell:</b> opposite of the NO photocell. The shock, photocell and open door contacts must be wired in series.<br><i>NOTE: The shock, photocell and open door contacts must all be of the same kind (NO or NC)</i> | ◀▶ Selection             | NO;<br>NC             | NO            |
|      | Doors Contact time | Waiting Time before start a trip (for old door's safety contact)   | ▲ Increase<br>▼ Decrease | 0,0 s <-> 3,0 s       | 0,1 s         |

### 5.7 "Signals<sub>[CA1]</sub>" Menu



| Cod. | Parameter                   | Description   | Navigation                            | Values   | Default value                  |
|------|-----------------------------|---|---------------------------------------|--|--------------------------------|
|      | Car priority                | Time of car at floor without direction before taking landing calls. In case of combined automatic doors, timing starts when doors have closed and the shock, photocell and re-opening contacts are not activated  | ▲ Increase<br>▼ Decrease              | 2 s <-> 30 s   | 10 s                           |
|      | Floor call registration     | Set the blinking for floor buttons upon registration  | ◀▶ Selection                          | Permanent;<br>Flashing at floor  | Permanent                      |
|      | AUX output                  | Selection of the output type on the 16 relays boards.<br><b>NOTE:</b> 1 wire/floor and 1 wire/floor HYD configurations are available only on first 16RL board.<br>After the two AUX board configuration can be set the outputs on BDUs (OUT-1 and OUT-2).<br>BDU Inputs<br>Type 0 = Car at floor and Out of Service<br>Type 1 = Arrows<br>Type 2 = Car at floor and Car is coming<br>Type 3 = 3 Wire Display<br>The first settings for all floors, the second setting can be used for specific configuration floor by floor.<br>The BDU dynamic output is used also in case of PIT8 boards (parallel pre wired LOPs).   | ◀▶ Selection<br><br>Tasti su e giù    | 1 wire per floor;<br>Car at floor;<br>Floor light;<br>Gray indicator;<br>9 segm. indicator;<br>Lift is coming<br><br>1 wire per floor HYD; | 1 wire per floor<br><br>Type 0 |
|      | Automatic floor designation | Automatic setting of numeric characters for serial position indicators. The value increases/decreases automatically at each floor starting from Lowest floor  | ▲ Increase<br>▼ Decrease              | -9 <-> 30  | Lowest fl.: 0                  |
|      | Manual floor designation    | Manual setting of alphanumeric characters for serial position indicators. Setting must be done for each floor   | ◀▶ Field Selection<br>▲▼ Change value | - ;<br>0 <-> 9 ;<br>A <-> Z  |                                |
|      | Trigger on PV               | It is possible to start trigger (speech synthesiser / next direction arrows) on deceleration point (Yes) or to floor arrival (No).  | ◀▶ Selection                          | No<br>yes  | No                             |
|      | Next direction arrows       | In case of parameter activation, arrow outputs are activated only when lift stops at floor (or on slowing down if trigger parameter on PV is active).   | ◀▶ Choice                             | No;<br>Yes   | No                             |
|      | LTMP Delay                  | This function handle the delay between a floor/car call and the light turning on. The output is deactivated XX seconds after the call has been served.<br>0 sec means no timer active (light ON)  | ▲ Increase<br>▼ Decrease              | 0 s <-> 240 s  | 1 sec.                         |
|      | EME Delay                   | This function handles the<br>-) Type of automatic emergency operation (only VVVF): <ul style="list-style-type: none"> <li>Type A = Nearest Floor in favourite direction (depends by the load inside cabine)</li> <li>Type B = Only brake modulation (only for Gearless 81-20 installations).</li> <li>Type C = On the main floor of the lift (External UPS must be calculated on basis of Installation characteristics)</li> <li>Type D = RNO for ship, evacuation on the fire evacuation floor (No UPS). For Multiplex the lifts will move once a time.</li> </ul> -) delay between the black out signal (IEME) and output command (OEME) before system switch in automatic emergency procedure. | ▲ Increase<br>▼ Decrease              | Type A<br>Type B<br>Type C<br>Type D<br><br>0 s <-> 30 s   | Type A<br><br>-----<br>0 sec.  |



| Cod. | Parameter       | Description  | Navigation | Values     | Default value |
|------|-----------------|--|------------|------------|---------------|
|      |                 | NOTE: for Hydro Emergency floor is the lowest floor  |            |            |               |
|      | Buzzer 81-21    | For 81-21 installation: use the 81-20's acoustic buzzer (bypass door) on the top of car as acoustic alarm when protections are not in active position. | ◀▶ Choice  | No;<br>yes | No            |
|      | Ship Functions  | Enable special operation for lift on ships   | ◀▶ Choice  | No;<br>yes | No            |
|      | Sound when stop | Enable sounds on COP's bip when lift stops at level.   | ◀▶ Choice  | No;<br>yes | No            |

## 5.8 “Special Features” Menu



Floor 0 12:30:56  
<Special Features>

Table of Parameters

| Parameter                       | Description   | Navigation                             | Values  | Default value      |
|---------------------------------|---|--|---|--------------------|
| Reset in                        | Direction of travel during reset procedure  | ◀▶ Selection                           | Down;<br>Up   | Down               |
| Travelling limits in inspection | Valid only for FAI/FAS positioning system.<br>Settings for the travelling limits during inspection mode.<br>If travelling is programmed beyond the limits, the controller does not allow any movement beyond top/bottom floors.   | ◀▶ Selection                           | Up to AGB/AGH;<br>Beyond AGB/AGH  | Up to AGB/AGH      |
| Fire-fighters                   | (Refer to Annex XI - Fire operation programming procedure )<br>Type of fire-fighter operations (if present) and relevant parameters (fire service access level and side, POM and CPOM key contact type); choice of relevant applicable norm:<br>- Norm NF P82-207 (France);<br>- EN 81-72 (a): no car FF key switch;<br>- EN 81-72 (b): with car FF key switch; | ◀▶ Select field<br>▲▼ Change value     | Not present;<br>NF P82-207;<br>EN 81-72 (a);<br>EN 81-72 (b);<br>EN 81-73<br>DM 15/09/2005 (IT) | Not present        |
| Fire detection                  | Parameter for fire detection at floors.<br>- if the lift is at a different floor than the one where fire was detected, all registered calls from/to this floor are cancelled;<br>- if the lift is at the floor where fire was detected, the controller blocks door opening, closes doors (if open upon fire detection) and sends the car to a safe floor        | ◀▶ Selection                           | No;<br>Yes NO<br>Yes NC   | No                 |
| Stop button registration        | The system registers the out of service mode (pressure of STOP button).<br>It is also possible to set the delay to avoid simultaneous movement in installations powered with a generator.   | ◀▶ Selection                           | No;<br>Yes  | No                 |
| EN 81-20                        | System setting according to EN 81-20  | ◀▶ Selection                           | No;<br>Yes  | No                 |
| Anti-nuisance fault             | Parameter for the detection of the anti-nuisance fault (number of stops without photocell activation after which all car calls are cancelled)   | ◀▶ Selection<br>▲▼ No. calls           | No; Yes<br>2 <-> 10   | No<br>3            |
| Out of service floor            | Floor for out of service.<br>Parking floor when HS input is enabled.  | ▲ Increase<br>▼ Decrease               | 0 <-> Floor No.:  | 0                  |
| Automatic return                | Parameters for car automatic return at floor: Return floor and Minimum waiting time before automatic return   | ◀▶ Select parameter<br>▲▼ Change value | No<br>0 <-> Floor No.:<br>1 min <-> 60 min  | No<br>0<br>15 min. |
| Return zones                    | Advanced settings for return at floor at planned hours / days:<br>- Day (0 = everyday, 1 = monday ... 7 = sunday);<br>- Selected time interval (4 interval each day);<br>- Return floor;<br>- Start time;<br>- End time (max time: 7h 45 min);  | ◀▶ Select parameter<br>▲▼ Change value |   |                    |
| R. zone timing                  | Timing for selected return zones  | ◀▶ Selection<br>▲▼ Change Value        | No; Yes<br>1 s <-> 120 s  | No<br>60 s         |
| Call erasing at floor           | Erasing all calls at floor where the car stops, with no control of the direction (only for full collective installations)   | ◀▶ Selection                           | No;<br>Yes  | No                 |
| Drift control (FR)              | Drift control (France)  | ◀▶ Selection                           | None; Traction drive;<br>Drum machine<br><br>Sul PlayPAD vengono riportati<br>Not present,      | None               |

| Parameter                    | Description   | Navigation  | Values                                    | Default value    |
|------------------------------|---|---|---|------------------|
|                              |   |   | Traz.Tamburo e<br>Traz.Argano             |                  |
| Push-button code             | <p>It allows you to program a 4-digit code for Car calls. A 4-digit code may be assigned to each BCx car button input, corresponding to the car pushbutton inputs.</p> <p>Example: if the BC0 pushbutton is associated with the 0123 code, to reserv floor 0 from Cabin you can:</p> <ol style="list-style-type: none"> <li>keep pressed the floor 0 pushbutton for 3 seconds.</li> <li>All COP pushbutton will blink</li> <li>Press in sequence the pushbuttons corresponding to the BC0, BC1, BC2, BC3;</li> </ol> <p><i>Note:</i> Enter a code between 0 and 9 corresponding to the inputs BC0 ÷ BC9</p> <p>Programming Code "0_ __" will enable the special function Pent House</p> | <p>◀▶ Select field</p> <p>▲▼ Change value</p>           |   |                  |
| Controle Temperature ambient | <p>Check the temperature in the engine room through the sensor (if present). If the temperature surpass the set thresholds for more than 30 seconds, the system stops at the floor and the error is recorded. The control is only active during normal operation or Cabin priority. After having set the two thresholds, pressing Enter you can perform the sensor calibration (immediately press Enter to retain the current calibration, otherwise set the room temperature value and then press Enter). The first threshold can be set between -10 ° C and +5 ° C while the second threshold can be set between +40 ° C and +75 ° C.</p>   | <p>◀▶ Select field</p> <p>▲▼ Change value</p>           | Without;<br>+5°C <=> +40°C                | Without          |
| Automatic Calls              | <p>When lift is in normal mode, "Automatic calls" can be activated to perform a specific calls number (up to 120 calls or unlimited) in steps of one minute. However is possible to enable or not the doors functionality (the system will also continue to accept floor calls simulating programmed calls, if enabled). The function ends automatically when the machineries are turned off or if the system is put in inspection mode.</p>  | <p>▲ Increase<br/>▼ Decrease</p> <p>◀▶ Select Doors</p> | 0 <-> 120<br>∞<br>10 <-> 60 s<br>Yes - No | 0<br>60 s<br>Yes |
| Monitor UCM                  | <p>A3 amendment.<br/>Configure type of monitor.<br/>For description, refer to Annex VIII.</p>   | <p>▲ Increase<br/>▼ Decrease</p> <p>◀▶ Choice</p>       |   |                  |
| UCM                          | <p>Installation type 81-1 / 81-20 / 81-21<br/>Shaft access procedure and Protections.<br/>For description, refer to Annex IX.</p>   | <p>▲ Increase<br/>▼ Decrease</p> <p>◀▶ Choice</p>       |   |                  |
| Forced Stop                  | <p>If programmed, the installation will stop at a specific floor at each crossing (some hotels use this function).</p>  | <p>▲ Increase<br/>▼ Decrease</p> <p>◀▶ Choice</p>       |   |                  |
| Protect floor                | <p>If a protected floor is programmed, when the car reaches the floor, the door does not open, instead the monitor will show images coming from the camera corresponding to that floor. Doors can be opened only by pressing the OPEN DOOR button; if this does not happen, the lift moves to the previous floor and then stops the protected floor mode (this operating mode is only possible with DMG's monitoring system).</p>   | <p>▲ Increase<br/>▼ Decrease</p> <p>◀▶ Choice</p>       |   |                  |
| Lop priority                 | <p>Enabling the floor priority call function. pairing with 16 IN card (or key inputs from BDU)</p>  | <p>◀▶ Choice</p>  | No;<br>Yes                                | No               |
| Enable Floor                 | <p>Enabling the call enabling function (e.g. CARD Reader). In combination with 16 IN card.<br/>Type 1: LOP enable: to enable calls, the corresponding input of the 16 IN card must be closed.</p>   | <p>▲ Increase<br/>▼ Decrease</p> <p>◀▶ Choice</p>       | No<br>Type 1<br>Type 2<br>Type 3          | No               |

| Parameter                | Description   | Navigation            | Values                                     | Default value |
|--------------------------|---|-----------------------|--|---------------|
|                          | Type 2: COP enabling To enable calls, the corresponding input of the 16 IN card must be closed<br>Type 3: Enable COP + LOP: to enable calls, the corresponding input of the 16 IN card must be closed (disabling the floor) |                       |  |               |
| Shaft Protection         | Protection of compartment and doors.<br>For description, refer to Annex X.  | ▲ Increase Decrease ▼ | No<br>Type 1<br>Type 2<br>Type 3<br>Type 4 | No            |
| Integrated Load Weighing | Enable function for Integrated load Weighing.<br>It is mandatory a calibration procedure (§ test 22)  | ◀▶ Selection          | No;<br>Yes                                 | No            |

## 5.9 “System Positioning” Menu



Table of Parameters (FAI / FAS positioning system)

| Cod. | Parameter          | Description   | Navigation                   | Values  | Default values                                       |
|------|--------------------|---|------------------------------|---|--|
|      | Positioning system | Type of positioning system: with Encoder or traditional. Can only be modified in Temporary Oper. Mode<br><b>Note:</b> in case of absolute Encoder and shaft lengths longer than 65 meters change the resolution of Encoder = 2 in autsetting menu before starts the Manual teach procedure. | ◀▶ Selection                 | FAI/FAS;<br>Encoder Clockwise;<br>Encoder Counter clockwise<br>Encoder ELGO | FAI/FAS  |
|      | Top PV             | Position of the deceleration (passage in Low Speed) and number of entrances   | ▲ Increase<br>▼ Decrease     | 2 <-> 6   | 5  |
|      | PV at floors       | Position of the specific deceleration for each floor  | ◀▶ Top PV<br>▲▼ Floor choice | Short floor or 2<->6<br>0 <-> No. Floor                                     | 5<br>all floors                                      |
|      | Short level delay  | Time before short level deceleration (only if a short level is programmed)  | ▲ Increase<br>▼ Decrease     | 0,00 s <-> 2,50 s   | 0,00s  |
|      | Top PV 2 Delay     | Delay before passage to Intermediate speed  | ▲ Increase<br>▼ Decrease     | 0,00 s <-> 2,50 s   | 0,00 s   |
|      | Delay Dir.-BRK     | VVVF: Delay between activation of travel direction and run command (BRK)  | ▲ Increase<br>▼ Decrease     | 0,0 s <-> 3,0 s   | 0,5 s - VVVF<br>0,0 s - Others                       |
|      |                    | OLEO: Star / Delta delay  | ▲ Increase<br>▼ Decrease     | 0,0 s <-> 3,0 s   | 0,5 s – VVVF<br>0,5 s – Star/Delta<br>0,0 s - Others |
|      | Delay BRK-S        | Delay between activation of BRK command and speed command   | ▲ increase<br>▼ decrease     | 0,0 s <-> 3,0 s   | 0,00 s   |
|      | Delay BRK-Dir.     | Delay between deactivation of run command and deactivation of travel direction (arrive al piano)  | ▲ Increase<br>▼ Decrease     | 0,0 s <-> 3,0 s   | 1,5 s - VVVF<br>0,0 s - Others                       |
|      | Inspection speed   | Sets the speed of travel in inspection  | ◀▶ Selection                 | Low speed;<br>High speed  | Low speed  |
|      | Emergency BRK On   | Emergency break modulation parameter (modify only if EME board is not present)  | ▲ increase<br>▼ decrease     | 0,0 s <-> 5,0 s   | 0,0s   |
|      | Emergency BRK Off  | Emergency break modulation parameter (modify only if EME board is not present)  | ▲ increase<br>▼ decrease     | 0,0 s <-> 5,0 s   | 0,0s   |

Table of Parameters (Encoder positioning system)

| Cod. | Parameter          | Description  | Navigation  | Values  | Default values                                       |
|------|--------------------|--|---|---|--|
|      | Positioning system | Type of positioning system: with Encoder or traditional. <b>Note:</b> Can only be modified in Temporary Oper. mode   | ◀▶ Selection  | Encoder Clockwise;<br>Encoder Counter clockwise<br>Encoder ELGO | Encoder Clockwise                                    |
|      | Autosetting        | Start of floor position self-learning procedure. Can only be modified in Temporary Operation mode. See § 2.1 for details   | ◀▶ Selection  | No;<br>Yes  | No   |
|      | Floor Position     | Position value for each floor  | ▲ increase<br>▼ decrease<br>◀▶ Floor pos. selection |   |  |
|      | Accel. Time        | Acceleration time. Time required to switch from start speed to travelling speed.   | ▲ increase<br>▼ decrease                            | 1,0 s <-> 5,0 s   | 3,0 s  |
|      | Starting Boost     | Starting speed   | ▲ increase<br>▼ decrease                            | 0 % <-> 10 %  | 3 %  |
|      | Stopping Boost     | Final (stopping) speed   | ▲ increase<br>▼ decrease                            | 0 % <-> 10 %  | 4 %  |
|      | Max speed          | Maximum speed during the travel  | ▲ increase<br>▼ decrease                            | 5 % <-> 100 %   | 100 %  |
|      | Inspection speed   | Travelling speed in inspection mode  | ▲ increase<br>▼ decrease                            | 5 % <-> 100 %   | 50 %   |
|      | AGB/AGH speed      | Travelling speed on AGB/AGH limit points. Same speed adopted during emergency operations   | ▲ increase<br>▼ decrease                            | 1 % <-> 15 %  | 10 %   |
|      | Delay Dir.-BRK     | VVVF: Delay between activation of travel direction and BRK command (start)   | ▲ increase<br>▼ decrease                            | 0,0 s <-> 3,0 s   | 0,5 s - VVVF<br>0,0 s - Others                       |
|      |                    | OLEO: Star / Delta delay   | ▲ Increase<br>▼ Decrease                            | 0,0 s <-> 3,0 s   | 0,5 s – VVVF<br>0,5 s – Star/Delta<br>0,0 s - Others |
|      | Delay BRK-S        | Delay between activation of BRK command and beginning of the analogic speed ramp   | ▲ increase<br>▼ decrease                            | 0,0 s <-> 3,0 s   | 0,3 s - VVVF<br>0,0 s - Others                       |
|      | Delay BRK-Dir.     | Delay between deactivation of run command and deactivation of travelling direction (stop at floor)   | ▲ increase<br>▼ decrease                            | 0,0 s <-> 3,0 s   | 1,5 s - VVVF<br>0,0 s - Others                       |
|      | Emergency BRK On   | Emergency break modulation parameter   | ▲ increase<br>▼ decrease                            | 0,0 s <-> 5,0 s   | 0,0s   |
|      | Emergency BRK Off  | Emergency break modulation parameter   | ▲ increase<br>▼ decrease                            | 0,0 s <-> 5,0 s   | 0,0s   |
|      | Monitor Encoder    | Contains information on:<br>Encoder features, reading of slowdown heights (R1D / R1S), re-levelling (RRIPD / RRIPS) and stop of the cabin (RLD / RLS) where D indicates down while S means up; finally it contains info on reading AGB / AGH and ZP heights.<br><br>Note: R1D and R1S heights can be modified pushing Enter without repeating self learning procedure (to let the slowing down distance be equal in rise and descent). |   |   |  |

**NOTE: Please consult the time diagram at the end of this manual, to better understand some parameter meanings.**

### 5.10 “VVVF” Menu

This menu is available only when a FUJI FRENIC LIFT VVVF is connected to a Control Lift Board



VVVF Basic menu list Parameters

| Cod. | Parameter        | Description  | Navigation                      | Values  | Default values   |
|------|------------------|--|---------------------------------|---|--|
| F03  | Maximum speed    | Max speed of the motor   | ◀▶ Selection<br>▲▼ Change Value | 150-3600 RPM  | 1500 RPM   |
| F05  | Rated Voltage    | Rated voltage of the motor driven by the inverter                            | ◀▶ Selection<br>▲▼ Change Value | 80-240 V<br><small>(for 200V class series)</small>  | 230 V  |
|      |                  |  |                                 | 160-500 V<br><small>(for 400V class series)</small> | 380 V  |
| F07  | Acc T1           | Acceleration ramp (Only with FAI/FAS positioning system)                     | ◀▶ Selection<br>▲▼ Change value | 0,00-99,9 s   | 1,8 s  |
| F08  | Dec T2           | Acceleration ramp (Only with FAI/FAS positioning system)                     | ◀▶ Selection<br>▲▼ Change value | 0,00-99,9 s   | 1,8 s  |
| F42  | Control Mode     | Control Mode   | ◀▶ Selection<br>▲▼ Change Value | 0-1-2   | 0<br><small>(Geared drives, closed loop)</small>             |
|      |                  |  |                                 |   | 1<br><small>(Gearless drives, closed loop)</small>           |
|      |                  |  |                                 |   | 2<br><small>(Geared drives, open loop)</small>               |
| E12  | Acc/dec T5       |  | ◀▶ Selection<br>▲▼ Change value |   | 1,8 s  |
| E13  | Acc/dec T6       |  | ◀▶ Selection<br>▲▼ Change value |   | 1,8 s  |
| E15  | Acc/dec T8       |  | ◀▶ Selection<br>▲▼ Change value |   | 1,8 s  |
| E16  | Acc/dec T9       |  | ◀▶ Selection<br>▲▼ Change value | 0.00 – 99.9 s                                       | 1,8 s  |
| C07  | Creep Speed      | Creeping speed (Only with FAI/FAS positioning system)                        | ◀▶ Selection<br>▲▼ Change value |   | 4,0 Hz<br><small>(Geared drives, open loop)</small>          |
|      |                  |  |                                 |   | 2,5 Hz<br><small>(Geared drives, closed loop)</small>        |
|      |                  |  |                                 |   | 1,5 Hz<br><small>(Gearless drives, closed loop)</small>      |
| C10  | Middle Speed     | System speed under inspection mode (Only with FAI/FAS positioning system)    | ◀▶ Selection<br>▲▼ Change value |   | 25 Hz<br><small>(Geared drives)</small>                      |
|      |                  |  |                                 |   | 10 Hz<br><small>(Gearless drives)</small>                    |
| C11  | High Speed       | High speed for multistep speed change (Only with FAI/FAS positioning system) | ◀▶ Selection<br>▲▼ Change value |   | 50 Hz<br><small>(Geared drives)</small>                      |
|      |                  |  |                                 |   | 20 Hz<br><small>(Gearless drives)</small>                    |
| P01  | Motor Poles      | Number of poles of the motor   | ◀▶ Selection<br>▲▼ Change value | (see motor plate)                                   | 4<br><small>(Geared drives)</small>                          |
|      |                  |  |                                 |   | 20<br><small>(Gearless drives)</small>                       |
| P02  | Motor Rated Cap  | Rated power of the motor   | ◀▶ Selection<br>▲▼ Change value | (see motor plate)                                   | Function of Inverter size                                    |
| P03  | Motor Rated Cur  | Rated current intensity of the motor   | ◀▶ Selection<br>▲▼ Change value | (see motor plate)                                   | Function of Inverter size                                    |
| P04  | Motor Autotuning | Auto tuning of motor parameters (geared drives only)                         | ◀▶ Selection<br>▲▼ Change value |   | 0 (2 to trigger the auto tuning procedure for geared drives) |
| P06  | M-No-Load Curr.  | Motor no-load current  | ◀▶ Selection<br>▲▼ Change value |   | Set by Motor Autotuning<br><small>(Geared drives)</small>    |
|      |                  |  |                                 |   | 0 A<br><small>(Gearless drives)</small>                      |
| P12  | M-Rated Slip     | Rated slip frequency of the motor  | ◀▶ Selection<br>▲▼ Change value | 0-15Hz  | Set by Motor Autotuning                                      |

| Cod.   | Parameter       | Description                                  | Navigation                      | Values        | Default values   |
|--------|-----------------|--|---------------------------------|---------------|--|
| L01(*) | PG select       | See Annex IV                                 | ◀▶ Selection<br>▲▼ Change value | 0-5           | 0<br>(Geared drives)<br>4<br>(Gearless drives with EnDat Encoder)<br>5<br>(Gearless drives with sin-cos Encoder) |
| L02(*) | PG resolution   | Resolution of the pulse encoder (Pulse/Turn) | ◀▶ Selection<br>▲▼ Change Value | 360-60000 P/R | 1024<br>(Geared drives)<br>2048<br>(Gearless drives)   |
| L19    | S-Curve 1       | S-Curve – 1                                  | ◀▶ Selection<br>▲▼ Change Value |               | 20 %<br>(Geared drives)<br>25 %<br>(Gearless drives)   |
| L24    | S-Curve 6       | S-Curve – 6                                  | ◀▶ Selection<br>▲▼ Change Value |               | 20 %<br>(Geared drives)<br>25 %<br>(Gearless drives)   |
| L25    | S-Curve 7       | S-Curve – 7                                  | ◀▶ Selection<br>▲▼ Change Value |               | 20 %<br>(Geared drives)<br>25 %<br>(Gearless drives)   |
| L26    | S-Curve 8       | S-Curve – 8                                  | ◀▶ Selection<br>▲▼ Change Value |               | 20 %<br>(Geared drives)<br>25 %<br>(Gearless drives)   |
| L27    | S-Curve 9       | S-Curve – 9                                  | ◀▶ Selection<br>▲▼ Change Value |               | 20 %<br>(Geared drives)<br>25 %<br>(Gearless drives)   |
| L82    | Brake On Delay  | Delay from activation of BRKS output         | ◀▶ Selection<br>▲▼ Change Value | 0,00-10,00 s  | 0,20 s   |
| L83    | Brake Off delay | Delay from deactivation of BRKS output       | ◀▶ Selection<br>▲▼ Change Value | 0,00-10,00 s  | 0,10 s   |

### VVVF Advanced menu list Parameters

| Cod. | Parameter      | Description   | Navigation                      | Values  | Default values  |
|------|----------------|---|---------------------------------|---|---|
| F01  | Speed command  | Command selection for speed variation   | ◀▶ Selection<br>▲▼ Change Value | 0=MULTISPEED<br>1=NR Analogic<br>(no polarized) no available                | 0<br>(with FAI/FAS positioning system)<br>1<br>(with Encoder positioning systems) |
| F03  | Maximum speed  | Max speed of the motor  | ◀▶ Selection<br>▲▼ Change Value | 150-3600 RPM  | 1500 RPM  |
| F04  | Rated speed    | Rated speed of the motor (Frequency)  | ◀▶ Selection<br>▲▼ Change Value |   | 50 Hz   |
| F05  | Rated Voltage  | Rated voltage of the motor driven by the inverter   | ◀▶ Selection<br>▲▼ Change Value | 80-240 V<br>(for 200V class series)<br>160-500 V<br>(for 400V class series) | 230 V<br>380 V  |
| F07  | Acc T1         | Acceleration ramp (only with FAI/FAS positioning system)                                      | ◀▶ Selection<br>▲▼ Change Value | 0,00-99,9 s   | 1,8 s   |
| F08  | Dec T2         | Deceleration ramp (only with FAI/FAS positioning system)                                      | ◀▶ Selection<br>▲▼ Change Value | 0,00-99,9 s   | 1,8 s   |
| F09  | TRQ Boost      | Torque increase   | ◀▶ Selection<br>▲▼ Change Value | 0,0-5,0   | 0,0<br>(up to 7,5 kW and from 30 kW)<br>0,3<br>(from 11 kW to 22 kW)              |
| F10  | Electronic OL  | Overload electrical protection  | ◀▶ Selection<br>▲▼ Change Value | 1 - 2   | 2   |
| F11  | Overload Level | Electronic Thermal Overload Protection for Motor (Value in Ampere equal to the inverter size) | ◀▶ Selection<br>▲▼ Change Value | 1 to 200%<br>(of the rated current)   | 100 %   |
| F12  | Overload time  | Thermic time constant   | ◀▶ Selection<br>▲▼ Change Value | 0.5 – 75.0 min.   | 0,5   |
| F20  | DCBrake speed  | Frequency threshold for DC INJECTION  |                                 |   | 0,2 Hz<br>(Open loop)   |



| Cod. | Parameter       | Description   | Navigation                      | Values                 | Default values  |
|------|-----------------|---|---------------------------------|------------------------|---|
|      |                 |   | ◀▶ Selection<br>▲▼ Change Value |                        | 0,0 Hz<br>(Closed loop)   |
| F21  | DC Brake level  | Intensity threshold for DC INJECTION  | ◀▶ Selection<br>▲▼ Change Value |                        | 50 %<br>(Open loop)<br>0 %<br>(Closed loop)   |
| F22  | DC Brake T      | DC INJECTION time   | ◀▶ Selection<br>▲▼ Change Value |                        | 1,0 s<br>(Open loop)<br>0,0 s<br>(Closed loop)  |
| F23  | Starting Speed  | Starting speed (in Hz) for the inverter   | ◀▶ Selection<br>▲▼ Change Value | 0,00-150               | 0,50 Hz<br>(Open loop)<br>0,00 Hz<br>(Closed loop)  |
| F24  | Holding Time    | Holding time of running at starting speed for the inverter  | ◀▶ Selection<br>▲▼ Change Value | 0,00-10 s              | 0,8 s<br>(FAT/FAS)<br>0,2 s<br>(Encoder)  |
| F25  | Stopping Speed  | Stopping speed (in Hz) for the inverter   | ◀▶ Selection<br>▲▼ Change Value |                        | 0,1 Hz  |
| F26  | Motor Sound     | Carrier frequency)  | ◀▶ Selection<br>▲▼ Change Value |                        | 15 kHz  |
| F42  | Control Mode    | Control Mode  | ◀▶ Selection<br>▲▼ Change Value | 0-1-2                  | 0<br>(Geared drives, closed loop)<br>1<br>(Gearless drives, closed loop)<br>2<br>(Geared drives, open loop) |
| F44  | Current Limiter | Activation level of the current limiter.<br>% to the rated current of the inverter.<br>If "Auto", value means no current limitation | ◀▶ Selection<br>▲▼ Change Value | 100% ↔ 230% or<br>Auto | 200 %   |
| E04  | Command X4      | Input X4 not used   | ◀▶ Selection<br>▲▼ Change Value |                        | 25  |
| E05  | Command X5      | Input X5 not used   | ◀▶ Selection<br>▲▼ Change Value |                        | 25  |
| E06  | Command X6      | Input X6 not used   | ◀▶ Selection<br>▲▼ Change Value |                        | 25  |
| E07  | Command X7      | Input X7 not used   | ◀▶ Selection<br>▲▼ Change Value |                        | 25  |
| E08  | Command X8      | Input X8 not used   | ◀▶ Selection<br>▲▼ Change Value |                        | 63  |
| E10  | Acc/dec T3      |   | ◀▶ Selection<br>▲▼ Change Value |                        | 1,8 s   |
| E11  | Acc/dec T4      |   | ◀▶ Selection<br>▲▼ Change Value |                        | 1,8 s   |
| E12  | Acc/dec T5      |   | ◀▶ Selection<br>▲▼ Change Value |                        | 1,8 s   |
| E13  | Acc/dec T6      |   | ◀▶ Selection<br>▲▼ Change Value |                        | 1,8 s   |
| E14  | Acc/dec T7      |   | ◀▶ Selection<br>▲▼ Change Value |                        | 1,8 s   |
| E15  | Acc/dec T8      |   | ◀▶ Selection<br>▲▼ Change Value |                        | 1,8 s   |
| E16  | Acc/dec T9      |   | ◀▶ Selection<br>▲▼ Change Value | 0.00 – 99.9 s          | 1,8 s   |
| E20  | Signal Y1       | Output Y1 (transistor) not used   | ◀▶ Selection<br>▲▼ Change Value |                        | 27  |
| E21  | Signal Y2       | Output Y2 (transistor) not used   | ◀▶ Selection<br>▲▼ Change Value |                        | 27  |
| E22  | Signal Y3       | Output Y3 (transistor) not used   | ◀▶ Selection<br>▲▼ Change Value |                        | 27  |
| E23  | Signal Y4       | Output Y4 (transistor) not used   | ◀▶ Selection<br>▲▼ Change Value |                        | 25  |

| Cod. | Parameter        | Description  | Navigation                      | Values              | Default values   |
|------|------------------|--|---------------------------------|---------------------|--|
| E30  | Speed Arr. Hyst  | Not used   | ◀▶ Selection<br>▲▼ Change Value |                     | 0,48 Hz<br>(Geared motor)<br>0,1 Hz<br>(Gearless motor)  |
| E31  | Speed Det.Lev    | Not used   | ◀▶ Selection<br>▲▼ Change Value |                     | 48,33 Hz   |
| E32  | Speed Det Hyst   | Not used   | ◀▶ Selection<br>▲▼ Change Value |                     | 0,48 Hz<br>(Geared motor)<br>0,1 Hz<br>(Gearless motor)  |
| E39  | RRD Level        | Recommended direction in emergency<br>(Not used)                                     | ◀▶ Selection<br>▲▼ Change Value |                     | 0 %  |
| E61  | Analog Input 12  | Function of analog input 12  | ◀▶ Selection<br>▲▼ Change Value | 0-2                 | 1  |
| E98  | Command FWD      | Function for screw terminal FWD  | ◀▶ Selection<br>▲▼ Change Value |                     | 98   |
| E99  | Command REV      | Function for screw terminal REV  | ◀▶ Selection<br>▲▼ Change Value |                     | 99   |
| C01  | BATRY TL I       | Torque limitation in emergency.<br>If "OFF", value means no current limitation       | ◀▶ Selection<br>▲▼ Change Value | 0% ⇔ 100% or<br>OFF | 0  |
| C02  | BATRY TL T       |  | ◀▶ Selection<br>▲▼ Change Value |                     | 0,0 s  |
| C03  | Battery Speed    | Speed during emergency run   | ◀▶ Selection<br>▲▼ Change Value |                     | 1,50 Hz  |
| C07  | Creep Speed      | Creeping speed (only with FAI/FAS<br>positioning system)                             | ◀▶ Selection<br>▲▼ Change Value |                     | 4,0 Hz<br>(Geared drives, open loop)<br>2,5 Hz<br>(Geared drives, closed loop)<br>1,5 Hz<br>(Gearless drives, closed loop) |
| C10  | Middle Speed     | System speed under inspection mode (only<br>with FAI/FAS positioning system)         | ◀▶ Selection<br>▲▼ Change Value |                     | 25 Hz<br>(Geared drives)<br>10 Hz<br>(Gearless drives)   |
| C11  | High Speed       | High speed for multistep speed change<br>(FAI/FAS positioning system)                | ◀▶ Selection<br>▲▼ Change Value |                     | 50 Hz<br>(Geared drives)<br>20 Hz<br>(Gearless drives)   |
| P01  | Motor Poles      | Number of poles of the motor   | ◀▶ Selection<br>▲▼ Change Value | (see motor plate)   | 4<br>(Geared drives)<br>20<br>(Gearless drives)  |
| P02  | Motor Rated Cap  | Rated power of the motor   | ◀▶ Selection<br>▲▼ Change Value | (see motor plate)   | Function of Inverter size  |
| P03  | Motor Rated Cur  | Rated current intensity of the motor   | ◀▶ Selection<br>▲▼ Change Value | (see motor plate)   | Function of Inverter size  |
| P04  | Motor Autotuning | Auto tuning of motor parameters (geared<br>drives only)                              | ◀▶ Selection<br>▲▼ Change Value |                     | 0 (2 to trigger the auto<br>tuning procedure for<br>geared drives)   |
| P06  | M-No-Load Curr.  | Motor no-load current  | ◀▶ Selection<br>▲▼ Change Value |                     | Set by Motor Autotuning<br>(Geared drives)<br>0 A<br>(Gearless drives)   |
| P07  | M-%R1            | Motor (%R1)  | ◀▶ Selection<br>▲▼ Change Value |                     | Set by Motor Autotuning<br>(Geared drives)<br>5 %<br>(Gearless drives)   |
| P08  | M-%X             | Motor (%X)   | ◀▶ Selection<br>▲▼ Change Value |                     | Set by Motor Autotuning<br>(Geared drives)<br>10 %<br>(Gearless drives)  |
| P09  | M-Slip driving   | Slip compensation gain in percentage to the<br>rated slip (P12) at the driving sides | ◀▶ Selection<br>▲▼ Change Value | 0,0-200%            | Set by Motor Autotuning  |
| P10  | M-Slip braking   | Slip compensation gain in percentage to the<br>rated slip (P12) at the braking sides | ◀▶ Selection<br>▲▼ Change Value | 0,0-200%            | Set by Motor Autotuning  |

| Cod.   | Parameter  | Description   | Navigation                      | Values                  | Default values                                      |
|--------|--|---|---------------------------------|-------------------------|---|
| P11    | M-Slip T   | Slip compensation time value (fixed)  | ◀▶ Selection<br>▲▼ Change Value |                         | 0,2 s   |
| P12    | M-Rated Slip                                     | Rated slip frequency of the motor   | ◀▶ Selection<br>▲▼ Change Value | 0-15Hz                  | Set by Motor Autotuning                             |
| P60    | Armature Resistance - Rs                         |   | ◀▶ Selection<br>▲▼ Change Value | Ohm                     | According Motor MX*** table                         |
| P62    | Armature q-axis reactance - Xs                   |   | ◀▶ Selection<br>▲▼ Change Value | Ohm                     | According Motor MX*** table                         |
| P63    | Interphase Inductive Voltage - E                 |   | ◀▶ Selection<br>▲▼ Change Value | V                       | According Motor MX*** table                         |
| P65    | q-axis inductance magnetic saturation correction |   | ◀▶ Selection<br>▲▼ Change Value | %                       | According Motor MX*** table                         |
| H04    | Auto reset Times                                 | Auto-resetting (Number of times)  | ◀▶ Selection<br>▲▼ Change Value |                         | 10  |
| H05    | Auto reset int                                   | Auto-resetting (Reset interval)   | ◀▶ Selection<br>▲▼ Change Value |                         | 5 s   |
| H06    | Cooling Fan CTRL                                 | Delay on Cooling Fan turning off<br><br>(Auto value means that there is no limit on fan control; fan is always turned on) | ◀▶ Selection<br>▲▼ Change Value | 0 min ⇔ 100 min or Auto | 5 min   |
| H57    | S-Curve 11                                       | Curve to S-11   | ◀▶ Selection<br>▲▼ Change Value | 0 – 50 %                | 20 %  |
| H58    | S-Curve 12                                       | Curve to S-12   | ◀▶ Selection<br>▲▼ Change Value | 0 – 50 %                | 20 %  |
| H64    | Zero Hold Time                                   |   | ◀▶ Selection<br>▲▼ Change Value |                         | 0,0 s<br>(with FAI/FAS positioning system)          |
|        |  |   |                                 |                         | 0,8 s<br>(with Encoder positioning systems)         |
| H65    | Soft Start Time                                  |   | ◀▶ Selection<br>▲▼ Change Value |                         | 0,0 s<br>(with FAI/FAS positioning system)          |
|        |  |   |                                 |                         | 0,0 s<br>(with Encoder positioning systems)         |
| H67    | Stop Hold Time                                   |   | ◀▶ Selection<br>▲▼ Change Value |                         | 0,00 s<br>(Open loop)                               |
|        |  |   |                                 |                         | 1,00 s<br>(Closed loop)                             |
| H96    | Brake Monitor                                    | Enable Brake monitor  | ◀▶ Selection<br>▲▼ Change Value | 0-1                     | 0   |
| H190   | Motor UVW order                                  | Sequenza fasi uscita motore   | ◀▶ Selection<br>▲▼ Change Value | 0-1                     | 1   |
| L01(*) | PG select  | See annex IV  | ◀▶ Selection<br>▲▼ Change Value | 0-5                     | 0<br>(Geared drives)                                |
|        |  |   |                                 |                         | 4<br>(Gearless drives with EnDat Encoder)           |
|        |  |   |                                 |                         | 5<br>(Gearless drives with sin-cos Encoder)         |
| L02(*) | PG resolution                                    | Resolution of the pulse encoder (Pulse/Turn)  | ◀▶ Selection<br>▲▼ Change Value | 360-60000 P/R           | 1024<br>(Geared drives)                             |
|        |  |   |                                 |                         | 2048<br>(Gearless drives)                           |
| L03(*) | P.P.Tuning                                       | See annex IV  | ◀▶ Selection<br>▲▼ Change Value |                         |   |
| L04(*) | P.P.Offset                                       | Magnetic Pole Position Offset (Offset angle) for gearless drives  | ◀▶ Selection<br>▲▼ Change Value |                         | Automatically set during Pole Position Tuning (L03) |
| L05(*) | ACR P gain                                       |   | ◀▶ Selection<br>▲▼ Change Value |                         | 1,5   |
| L07(*) | Automatic pole tuning selection                  |   | ◀▶ Selection<br>▲▼ Change Value |                         | According Motor MX*** table                         |

| Cod.   | Parameter       | Description   | Navigation                      | Values                    | Default values  |
|--------|-----------------|---|---------------------------------|---------------------------|---|
| L19    | S-Curve 1       | L19 to L28 specify S-curve zones to be applied to operations driven by multistep speed commands with S-curve acceleration/deceleration. | ◀▶ Selection<br>▲▼ Change Value |                           | 20 %<br>(Geared drives)                               |
|        |                 |   |                                 |                           | 25 %<br>(Gearless drives)                             |
| L20    | S-Curve 2       |   |                                 |                           | 20 %<br>(Geared drives)                               |
|        |                 |   |                                 |                           | 25 %<br>(Gearless drives)                             |
| L21    | S-Curve 3       |   |                                 |                           | 20 %<br>(Geared drives)                               |
|        |                 |   |                                 |                           | 25 %<br>(Gearless drives)                             |
| L22    | S-Curve 4       |   |                                 |                           | 20 %<br>(Geared drives)                               |
|        |                 |   |                                 |                           | 25 %<br>(Gearless drives)                             |
| L23    | S-Curve 5       |   |                                 |                           | 20 %<br>(Geared drives)                               |
|        |                 |   |                                 |                           | 25 %<br>(Gearless drives)                             |
| L24    | S-Curve 6       | 20 %<br>(Geared drives)   |                                 |                           |   |
|        |                 | 25 %<br>(Gearless drives)   |                                 |                           |   |
| L25    | S-Curve 7       | 20 %<br>(Geared drives)   |                                 |                           |   |
|        |                 | 25 %<br>(Gearless drives)   |                                 |                           |   |
| L26    | S-Curve 8       | 20 %<br>(Geared drives)   |                                 |                           |   |
|        |                 | 25 %<br>(Gearless drives)   |                                 |                           |   |
| L27    | S-Curve 9       | 20 %<br>(Geared drives)   |                                 |                           |   |
|        |                 | 25 %<br>(Gearless drives)   |                                 |                           |   |
| L28    | S-Curve 10      | 20 %<br>(Geared drives)   |                                 |                           |   |
|        |                 | 25 %<br>(Gearless drives)   |                                 |                           |   |
| L29    | SFO Hold T      | Short Floor Operation (Holding time)<br>Only used for FAI-FAS positioning mode  | ◀▶ Selection<br>▲▼ Change Value | 0,00 s ↔ 10,00s<br>or OFF | OFF   |
| L30    | SFO Speed       | Short Floor Operation (Allowable speed) – NOT USED  | ◀▶ Selection<br>▲▼ Change Value |                           | 0,00 s  |
| L36(*) | ASR P Gain High | See annex V   | ◀▶ Selection<br>▲▼ Change Value |                           | 10,00<br>(Geared drives)<br>2,50<br>(Gearless drives) |
| L37(*) | ASR I Gain High | See annex V   | ◀▶ Selection<br>▲▼ Change Value |                           | 0,100   |
| L38(*) | ASR P Gain Low  | See annex V   | ◀▶ Selection<br>▲▼ Change Value |                           | 10,00<br>(Geared drives)<br>2,50<br>(Gearless drives) |
| L39(*) | ASR I Gain Low  | See annex V   | ◀▶ Selection<br>▲▼ Change Value |                           | 0,100   |
| L40(*) | Switch Speed 1  | Not used  | ◀▶ Selection<br>▲▼ Change Value |                           | 5,00<br>(Geared drives)<br>1,00<br>(Gearless drives)  |
| L41(*) | Switch Speed 2  | Not used  | ◀▶ Selection<br>▲▼ Change Value |                           | 10,00<br>(Geared drives)<br>2,00<br>(Gearless drives) |
| L42(*) | ASR-FF Gain     |   | ◀▶ Selection<br>▲▼ Change Value | 0.000 – 10.000 s          | 0.000 s   |
| L55(*) | TB Start time   |   | ◀▶ Selection<br>▲▼ Change Value | 0.00 – 1.00 s             | 0.20 s  |
| L56(*) | TB End time     |   | ◀▶ Selection<br>▲▼ Change Value | 0.00 – 20.00 s            | 0.20 s  |

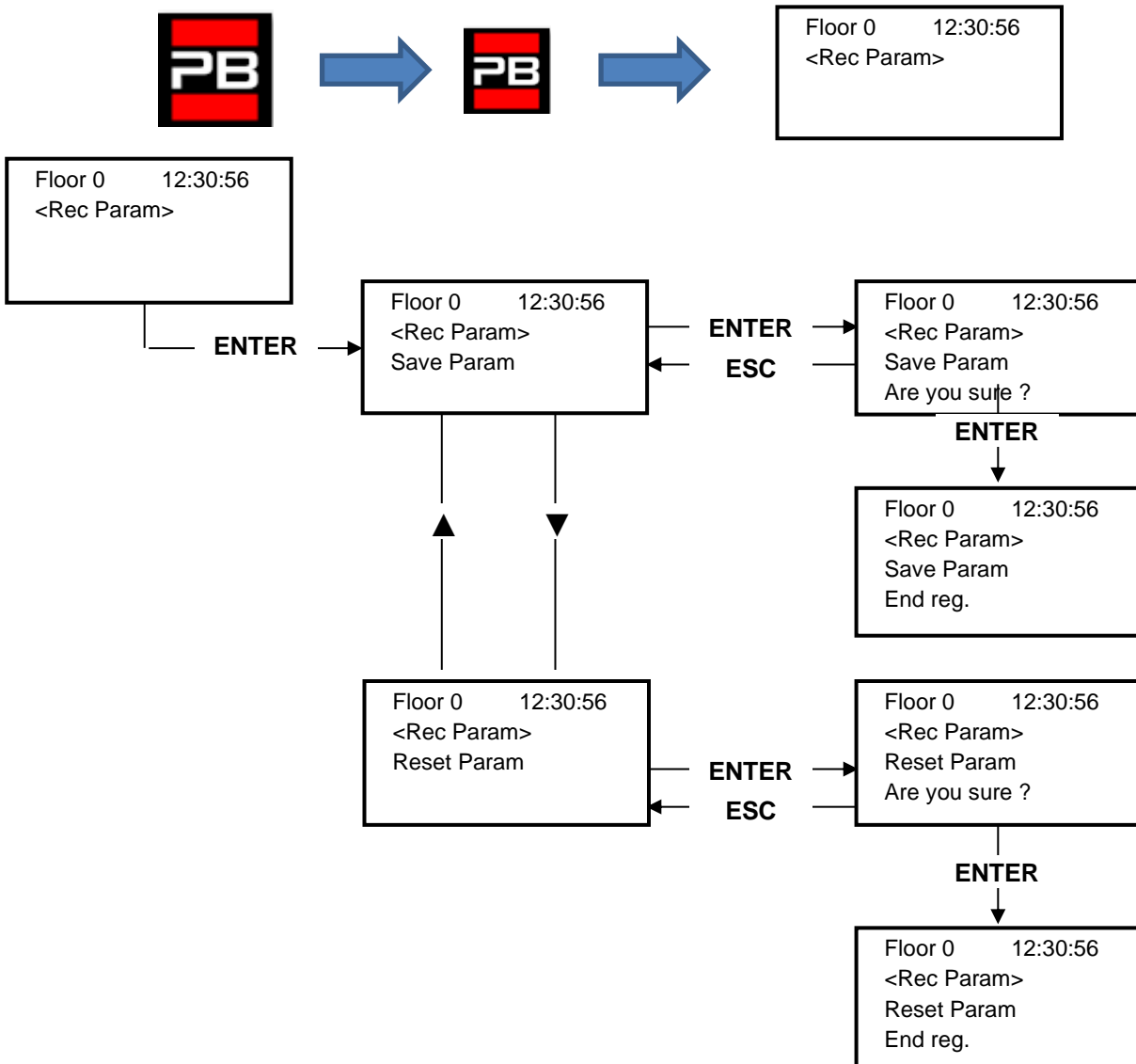
| Cod.    | Parameter                             | Description  | Navigation                      | Values                           | Default values              |
|---------|---------------------------------------|--|---------------------------------|----------------------------------|-----------------------------|
| L64(*)  | TB Digital 3                          |  | ◀▶ Selection<br>▲▼ Change Value | -200 - +200 %                    | 0 %                         |
| L65(*)  | ULC operation                         | Unbalanced load Compensation   | ◀▶ Selection<br>▲▼ Change Value | 0-1                              | 1                           |
| L66(*)  | ULC activation                        | Unbalanced load compensation (Activation time)   | ◀▶ Selection<br>▲▼ Change Value | 0,01-2,00 s                      | 2,00 s                      |
| L68(*)  | ULC ASR P gain                        | See annex V  | ◀▶ Selection<br>▲▼ Change Value |                                  | 10,00<br>(Geared drives)    |
|         |                                       |  |                                 |                                  | 2,50<br>(Gearless drives)   |
| L69(*)  | ULC ASR I gain                        | See annex V  | ◀▶ Selection<br>▲▼ Change Value |                                  | 0,100<br>(Geared drives)    |
|         |                                       |  |                                 |                                  | 0,005<br>(Gearless drives)  |
| L73(*)  | APR P gain zero                       | See annex V  | ◀▶ Selection<br>▲▼ Change Value |                                  | 0                           |
| L74(*)  | APR D Gain                            |  | ◀▶ Selection<br>▲▼ Change Value |                                  | 0,0                         |
| L75(*)  | Filter Time                           |  | ◀▶ Selection<br>▲▼ Change Value |                                  | 0,000 s                     |
| L76(*)  | ACR P constant                        |  | ◀▶ Selection<br>▲▼ Change Value |                                  | 0,00                        |
| L80     | Brake mode                            | Brake Control (BRKS) output mode   | ◀▶ Selection<br>▲▼ Change Value | 1-2                              | 1                           |
| L81     | Brake On Level                        | Output current that turns the BRKS signal ON when L80 = 2.   | ◀▶ Selection<br>▲▼ Change Value | 0,-200% of motor no-load current | 100 %                       |
| L82     | Brake On Delay                        | Delay from activation of BRKS output   | ◀▶ Selection<br>▲▼ Change Value | 0,00-10,00 s                     | 0,20 s                      |
| L83     | Brake Off delay                       | Delay from deactivation of BRKS output   | ◀▶ Selection<br>▲▼ Change Value | 0,00-100 s                       | 0,10 s                      |
| L84     | BRKS check t                          | Allowable time between BRKS output and BRKE input (Er6)  | ◀▶ Selection<br>▲▼ Change Value | 0,00-10 s                        | 0,00 s                      |
| L99     | ACTION SEL                            | Not used   | ◀▶ Selection<br>▲▼ Change Value |                                  |                             |
| L122    | Del. Op. Input Power Det. Level       |  | ◀▶ Selection<br>▲▼ Change Value | %                                |                             |
| L124    | Del. Op. Dir. Calc. Delay Timer       |  | ◀▶ Selection<br>▲▼ Change Value | s                                |                             |
| L130    | Sheave diameter (Ds)                  |  | ◀▶ Selection<br>▲▼ Change Value | mm                               | According Motor MX*** table |
| L131    | Encoder diameter (De)                 |  | ◀▶ Selection<br>▲▼ Change Value | mm                               | According Motor MX*** table |
| L132    | Theta compensation band               |  | ◀▶ Selection<br>▲▼ Change Value | deg                              | According Motor MX*** table |
| L133    | Theta compensation gain lower limiter |  | ◀▶ Selection<br>▲▼ Change Value |                                  | According Motor MX*** table |
| L134(*) | Backlash Time                         | Backlash Time (When L65 = 2)   | ◀▶ Selection<br>▲▼ Change Value | 0,00-10,00 Sec                   | 0                           |
| L198    | Op. set switch 1                      | BIT0 = It is possible to fix the carrier frequency to 16 kHz for the whole speed range in order to reduce driving noise. | ◀▶ Selection<br>▲▼ Change Value |                                  | 0                           |
| L199    | Op. set switch 2                      | Reserved.  | ◀▶ Selection<br>▲▼ Change Value |                                  | 0                           |

(\*) not available on LM2C Inverters model.

**NOTE: Please consult the time diagram at the end of this manual, to better understand some meaning parameters.**

## 5.11 "Rec Parameters" Menu

**Note:** data saving is not required only for emulation of PBV3 controllers.



## 5.12 "Clock" Menu



**Da** = Day  
**Mo** = Month  
**Yr** = Year  
**D** = Weekday (1=Mon)  
**Hr** = Hours  
**Mn** = Minutes

**WARNING:** In case of system shutdown, the time is saved by means of a Super Capacitor (for up to 5 days without power supply).

## 6 Troubleshooting

| N. | Fault              | Type | Description  | Remedy   |
|----|--------------------|------|--|--|
| 1  | Reset              |      | <p>Power supply: the controller was restarted. For informational purpose only.</p> <p>Furthermore, if there are devices that require a restart, it can present itself with the following specific codes:<br/>           Cod 9: 9 months without power cycle reset, lift continues to operate.<br/>           Cod 12: 12 months without power cycle reset, lift is out of service. Must be executed a POWER restart</p> <p>Cod 255: remote fault reset executed.</p>  | <p>Cod 9 / 12 are present only in case of LM2 inverter or LIMAX3CP. Power restart is requested from these devices.</p> <p>Cod 255: only for information.</p>   |
| 2  | Contactors blocked |      | <p>One or more contacts associated to the power contactors and connected in series on the input CCO and CCOB or YBRK remain open after the car stop.</p> <p>-----<br/> <b>VVVF</b><br/>           Cod 0: CCO open<br/>           Cod 1: CCOB open<br/>           Cod 2: CCO+CCOB open<br/>           -----<br/> <b>HYDRO</b><br/>           Cod 11: YBRK open (CM1)<br/>           Cod 12: CCO open (CM2)<br/>           Cod 13: CCO open (CM1 or CM2)<br/>           Cod 14: YBRK open (CM2 or Soft Starter)<br/>           Cod 15: CCO open (CM1 or CM2)<br/>           Cod 200: CCOB open (Valves contactors)</p> | <p>VVVF - Check:</p> <ol style="list-style-type: none"> <li>the series of auxiliary contacts (NC) of the power contactors and other cables in series on the circuits</li> <li>the signals circuit wiring</li> <li>the connection of the CCO and CCOB on the board</li> </ol> <p>-----<br/>           HYDRO - Check:</p> <ol style="list-style-type: none"> <li>the series of auxiliary contacts (NC) of the motor contactors</li> <li>wiring of signal input indicated in the wiring schematic.</li> <li>the connection of the CCO, CCOB and YBRK on the boards</li> </ol> |
| 3  | Low speed too long |      | <p>Car moving at low speed for too long. In case of VVVF may be too low engine torque in the approaching floor phase.</p>  | <p>Check:</p> <ol style="list-style-type: none"> <li>Check parameter "Low Speed fault time" (§ 5.5) and increase time if necessary</li> <li>the elevator speed to a low speed (in the case of VVVF); increase it if necessary</li> <li>3a- the decelerating distance to the plane indicated (magnets FAI / FAS)</li> <li>3B- value of the distance R1D / R1S if Encoder is used (§ 5.9)</li> </ol>   |
| 4  | Overload           |      | <p>Overload input (SUR) activated (NO contact)</p>   | <p>Check</p> <ol style="list-style-type: none"> <li>the SUR input (if locked) and wiring</li> <li>the setting of the load weighing device</li> </ol>   |



| N. | Fault                       | Type | Description  | Remedy  |
|----|-----------------------------|------|--|---|
| 5  | Positioning fault           |      | <p>This error shows a difference between the performed theoretical counting and the real position detected:</p> <p>Cod 0: at the activation of the AGB/AGH limit contacts;<br/>Cod 100: at the activation of ZP magnet floor<br/>Cod 200: at the activation of stop level's ZP magnet floor</p>      | <p>Check:</p> <ol style="list-style-type: none"> <li>1- the correct positioning of the magnets (or flags)</li> <li>2- operation of magnetic reeds or encoder; verify the arrival of 24V current</li> <li>3- the distance between extreme contact and magnet</li> </ol>                                |
| 6  | Direction fault             |      | <p>The controller detects the wrong direction of travel</p>  | <p>Check:</p> <ol style="list-style-type: none"> <li>1- the direction of travel of the engine (control UP vs. Car movement direction)</li> <li>2- the installation and connection of FAI / FAS sensors</li> <li>3- CW / CCW Encoder configuration (§ 5.9)</li> <li>4- AGH and AGB inputs</li> </ol>   |
| 7  | Safety 3 open at stop       |      | <p>Safety chain interrupted with elevator not running. Calls are deleted. On the PlayPad Led SE3 is off.</p>   | <p>Check all contacts between the terminals SC2 and SE3 (Safety Gear, Limit switch, Overspeed Governor).</p>  |
| 9  | Door lock fault             |      | <p>Safety chain open at point SE6 when a call is registered<br/><i>With automatic door:</i> door re-opens and then closes (3 times, after which all calls are cancelled).<br/><i>Other door types:</i> after a few seconds all calls are cancelled</p> <p>Cod 5: floor locks<br/>Cod 6: car door</p> | <p>Check all contacts between the terminals SD2 and SD3 (floor locks) or SC4 and SC5 (car doors) according cod info, their connection and if an object obstructs the closing of the door to the indicated floor (POS).<br/>In case of 81-21 devices check its contacts in Normal mode operations.</p> |
| 10 | Door A opening slippage     |      | <p>Only doors with limit switch: door does not open within the planned time. In case of slippage during door opening, the door is considered open</p>  | <p>Check:</p> <ol style="list-style-type: none"> <li>1- Door open limit switch (FOA) and its wiring;</li> <li>2- door operator power supply and fuses;</li> <li>3- door open contactors (ROA)</li> </ol>  |
| 11 | Door B opening slippage     |      | <p>Same as door A, for second entrance</p>   | <p>Same as A, but signals (FOB) and (ROB).</p>  |
| 12 | Safety 3 open during travel |      | <p>Safety chain open before Input SE3 while car travelling. Car stops and car calls are cancelled.<br/>On the PlayPad Led SE3 is off.</p>  | <p>Check all contacts between the terminals S35-S36 (Top of Car)<br/>SC3-SM4 (controller)</p> <p>Safety devices: Safety Gear, Limit switch, Overspeed Governor.</p>   |

| N. | Fault                       | Type | Description   | Remedy  |
|----|-----------------------------|------|---|---|
| 13 | Motor temperature sensor    |      | Inputs TH1 or TH2 of motor temperature is activated (NC contact)<br><br>Cod 1: TH1 open<br>Cod 2: TH2 open<br>Cod 3: TH1 and TH2 open<br><br>Cod 10: Door's thermic input (TOC board)   | Check inputs (TH1, TH2), sensor connections and the state of the motor's temperature sensor.<br><br>Cod 1 Check TH1 input<br>Cod 2 Check TH2 input<br>Cod 3 Check TH1 and TH2 inputs<br><br>Cod 10 Check door's thermic input on TOC board's M16 Connector. |
| 14 | Parameters memory           |      | Fault in the Eprom parameters memory  | Reset, re-enter and record all parameters   |
| 15 | Final limit switch          |      | When it is reached the final limit switch (or Safety Gear or Overspeed Governor limiter trip), the input SE3 is active (NC contact).<br>After delay of 1,5 s the error remains in memory, even after deactivation of the signal, and inhibits the landing calls and the car movements, until special reset Menu "Errors" is made (Reset SE3). | 1- Release the final limit switch (or Safety Gear or OSG) closing the safety chain (SE3) and cancel fault in the "Error" Menu (§ 5.3).<br>2- Check the connection of the NC contact between SC2 and SE3 terminals   |
| 16 | Fire detection.             |      | In case of fire sensors installed, this fault indicates that one or more sensors are active   | Check fire sensor input(s)  |
| 17 | Safety 4 open during travel |      | Safety chain open before input SE4 while car travelling.<br>Landing calls and the car movements are cancelled<br>On the PlayPad Led SE4 is off.   | Check all contacts between the terminals SD1 and SD2 (Preliminaries floor doors).   |
| 18 | Safety 6 open during travel |      | Safety chain open before Input SE6 while car travelling.<br>landing calls and the car movements are cancelled<br>On the PlayPad Led SE6 is off.<br><br>Cod 5: floor locks<br>Cod 6: car door  | Check all contacts between the terminals SD2 and SD3 (floor locks).<br><br>Check all contacts between the terminals SC4 and SC5 (car door).<br><br>Check all contacts between the terminals SC5 and SE6 (Protection device 81-21).                          |
| 19 | Low tension during movement |      | Motherboard power below 17V (this fault disappears when the 24V is restored)<br><br>Cod 0: Main power Input<br>Cod 1: Overcurrent on VCAB<br>Cod 2: Overcurrent on VMR<br>Cod 3: Short Circuit on VCAB<br>Cod 4: Short Circuit on VMR<br>Cod 230: Missing 230 V, controller is powered with batteries   | Check the network, the supply voltage to the transformer primary, the presence of 24V and the consumption of the circuit.<br><br>Cod 230 check backup circuit (R230) if present or shunt on J8 of CHAR board.   |

| N. | Fault                      | Type | Description  | Remedy  |
|----|----------------------------|------|--|---|
| 20 | Travel interrupted         |      | During upward (or downward) movements contactors open while RMO (or RDE) commands are active. Possible short interruption of the safety circuit while moving.<br>Cod 100: CCO signal falling during travel<br>Cod 200: CCOB signal falling during travel | Check:<br>1- Preliminary contacts and door lockers at the indicated floor<br>2- car door contacts<br>3- the supply voltage of the safety circuit  |
| 21 | CCO input blocked          |      | The contactors control circuit (Input CCO) remains closed after travel command is given<br><br>Cod 100: CCO<br>Cod 200: CCOB<br>Cod 250: CTB not activated   | check:<br>1- wiring and state of the auxiliary contacts (NC) of the power contactors and other NC contacts wired in series on the CCO / CCOB circuit<br>2- CCO / CCOB Motherboard input                       |
| 22 | Low tension at stop        |      | Same as Fault N.19<br><br>Cod 0: Main power Input<br>Cod 1: Overcurrent on VCAB<br>Cod 2: Overcurrent on VMR<br>Cod 3: Short Circuit on VCAB<br>Cod 4: Short Circuit on VMR<br>Cod 230: Missing 230 V, controller is powered with batteries              | Check the network, the supply voltage to the transformer primary, the presence of 24V and the consumption of the circuit.<br><br>Cod 230 check backup circuit (R230) if present or shunt on J8 of CHAR board. |
| 23 | AGB blocked                |      | The expected operation of AGB (NC) contact is not checked.<br><br>Cod 100: contact is not closed at floor different from bottom floor (downward calls erased).<br>Cod 200: contact is not open at lowest floor (lift locked)                             | Check the condition of the contact AGB (mechanical switch or magnetic sensor) and the AGB circuit wiring  |
| 24 | AGH blocked                |      | The expected operation of AGH (NC) contact is not checked.<br><br>Cod 100: contact is not closed at floor different from top floor (upward calls erased).<br>Cod 200: contact is not open at top floor (lift locked)                                     | As for the error 23, regarding the AGH input  |
| 25 | AGH and AGB simultaneously |      | Inputs AGB / AGH opened simultaneously. The system shuts down.   | Check the condition of AGH and AGB contacts (mechanical or magnetic) and their wiring.<br>When one of the two contacts is closed, the system performs a reset manoeuvre.                                      |

| N. | Fault                       | Type | Description  | Remedy  |
|----|-----------------------------|------|--|---|
| 26 | Running time UP             |      | <p>No change in the beam status for motion sensors (or floor) for more than planned during car travel. In case of encodeur the threshold is 1 sec. over AGB/AGH limit point</p> <p>Cod 0: problem on FAI FAS input (no changing of inputs for time longer than "Running time" parameter<br/>Cod 100: problem on encoder channel<br/>Cod 200: no changing of ZP input for time longer than "Running time" parameter</p> | <p>Check contactors, brake, motor power supply, FAI/FAS sensors (or ENCODER).<br/>Check "X1" and "12" inputs of the VVVF.<br/>Anti-slippage test: <b>See Annex II – Test and measures</b></p>       |
| 27 | Running time DOWN           |      | See above but in downward movement   | See above but in downward movement  |
| 28 | Door A closing slippage     |      | <p>Only doors with limit switch: Door A does not close within programmed time.<br/>3 complete opening/closing cycles are performed, then all registered calls are cancelled</p>  | <p>Check:</p> <ol style="list-style-type: none"> <li>door close limit switch FFA (NC contact) and wiring</li> <li>door motor power supply and fuses</li> <li>door close contactors (RFA)</li> </ol> |
| 29 | Door B closing slippage     |      | Same as door A, for second entrance  | Same as door A, but signals (FFB) and (RFB)   |
| 30 | Out of service switch       |      | <p>If the relevant parameter has been programmed, it indicates that the system has been put out of service through the activation of input HS</p> <p>Cod 0: Key HS activation<br/>Cod 100: BDU's key activation.<br/>Cod 200: cabine key activation.</p>   | <p>Check input out of service input (NO contact)</p> <p>Cod 0: input HS on screw terminal<br/>Cod 100: input IN 2 on BDU<br/>Cod 200: input SPARE on DMCPIT</p>                                     |
| 31 | FAI-FAS error               |      | <p>Simultaneous variation of FAI/FAS positioning sensors. POS [n] indicates that the error occurred at floor [n].<br/>POS 100 indicates a wrong sequence of beams</p>  | <p>Check power supply to sensors;<br/>Check sensors and magnets position.</p>   |
| 32 | Temporary op. without insp. |      | During temporary operations the input REV or REV1 or REV2 must be active or the lift will not move.  | Check input REV, REV1 or REV2 (NC contact)  |
| 33 | Stopping accuracy           |      | <p>When the lift stops at floor, the two FAI/FAS LEDs are on. If within 2 seconds from the stop one of the beams is interrupted, this fault occurs. If the system is equipped with ENCODER the uncertainty of the stop is more than 2 cm.</p>  | <p>Check:</p> <ol style="list-style-type: none"> <li>position of the magnets;</li> <li>deceleration distances;</li> <li>motor brake</li> </ol>  |
| 34 | Anti- nuisance              |      | <p>It appears after a call cancellation and if the parameter "Anti- nuisance" has been programmed.<br/>The reason is too many calls from the car without the cell being cut (in case of combined doors) or without landing doors opening (other door types)</p>  | Change number of unwanted calls in the Anti- nuisance parameter   |

| N. | Fault               | Type | Description   | Remedy   |
|----|---------------------|------|---|--|
| 35 | Lift not available  |      | <p>The lift cannot take calls and is not considered for call dispatching (in multiplex). After 3 closing door cycles, the lift is considered unavailable for 1 minute.</p> <p>Cod 10: No power on Car light</p> <p>Only in multiplex:</p> <p>Cod 100: light curtain / door open button</p> <p>Cod 200: no SE4 signal (eg manual door not closed)</p>  |  |
| 36 | Phase sequence      |      | Wrong sequence in input phases. Could be detected even during system shutdown   | Check the right sequence of phases or swap two phases on power input terminals L1-L2-L3  |
| 37 | Low battery         |      | Low charge on 24V battery   | Test battery charge or change battery  |
| 38 | SE2 open            |      | <p>Safety chain open. Landing calls and the car movements are cancelled. Playpad SE2 led is off.</p> <p>Cod 0: DIS switch open (SE0 led off)</p> <p>Cod 1: PIT safety circuit open (SE1 led off)</p> <p>Cod 2: TOC safety circuit open (SE2 led off).</p>   | <p>Check DIS Switch</p> <p>Check all contacts between the terminals SP3 and SP4 (STOP in the pit, pit ladder, Inspection box, etc.).</p> <p>Check all contacts between the terminals SC1 and SC2 (STOP on the Toc, Toc protection, Inspection box, etc).</p>   |
| 39 | Ambient temperature |      | <p>This error indicates that the ambient temperature detected by the sensor is outside the set limits.</p> <p>Cod 100: Temperature below the lower threshold;</p> <p>Cod 200: temperatures above the higher threshold.</p>  | <p>1 - Check the presence and connection of the temperature sensor.</p> <p>2- Control activation, the threshold adjustment and sensor calibration can be made in the Special Features menu.</p>  |
| 40 | Fault RSP           |      | <p>For reduced pit and headroom.</p> <p>Cod 20: pit access according EN81.20</p> <p>Cod 21 shaft access according EN81.21</p> <p>Cod 41: Fake pit access according EN81.41</p> <p>Cod 111: Monitor Relay RSDC fail (contact doesn't open)</p> <p>Cod 121: reset circuit bi stable contact EN81.21 (automatic reset)</p> <p>Cod 131: Bistabile circuit (relay RSR1)</p> <p>Cod 132: Bistabile circuit (relay RSR2)</p> | <p>Clear RSP parameter in the menu Faults (§ 5.3)</p> <p>Cod 111 check right working of relay RSDC</p> <p>Cod41 (Junior): the fault reset itself automatically after restoring the fake pit circuit (input E511 closed)</p> <p>Cod. 121: check reset circuit. It could be possible automatic reset of bi stable contacts caused by problem on reset circuit. The contact series must be open and then make a standard reset.</p> <p>Cod 131 (132) check right working of relsy RSR1 (RSR2) and after make the Reset procedure.</p> |

| N. | Fault             | Type | Description  | Remedy  |
|----|-------------------|------|--|---|
| 41 | Fault ISO         |      | <p>Problem detected in the operation monitoring of safety module for advanced door opening / re-leveling. If activated, the installation goes into "out of service" mode at the top floor (electric) or bottom floor (hydro).</p> <p>Cod. 10: Monitor Relay RISO fail<br/>Cod 100: fail on Safety module monitor during travel<br/>Cod 200: fail on Safety module monitor at level</p>   | <p>Check the alignment of ISO1 and ISO2. Reset ISO in the menu Faults (§ 5.3).</p>  |
| 42 | TOC Communication |      | <p>No serial link between controller and car (in case of car serial link system configuration)</p>   | <p>Check CAN link between controller and top of car board</p>   |
| 43 | Inspection        |      | <p>The system is in Inspection mode (NORM/ISP switch set to Inspection)</p> <p><b>EN 81.1/2</b><br/>Cod 1: REV input open (STD Version)<br/>Cod 2: TOC's REV1 input open<br/>Cod 3: REV + TOC's REV1 input open<br/>Cod 5: REV input open (Pitagora version)<br/>Cod 6: REV1 input open<br/>Cod 7: REV + TOC's REV1 input open</p> <p><b>EN 81.20</b><br/>Cod 11: PME inspection (REV)<br/>Cod 12: TOC inspection (REV1)<br/>Cod 13: PME + TOC inspection (REV + REV1)<br/>Cod 14: PIT Inspection (REV2)<br/>Cod 15: PME + PIT Inspection (REV + REV2)<br/>Cod 16: TOC + PIT Inspection (REV1 + REV2)<br/>Cod 17: PME + TOC + PIT Inspection (REV + REV1 + REV2)</p> | <p>To exit the inspection mode move the NORM/ISP switch to Normal and close the safety chain to trigger the reset procedure</p> |

| N. | Fault                      | Type | Description  | Remedy  |
|----|----------------------------|------|--|---|
| 44 | Re-levelling not completed |      | Hydraulic lifts: the re-levelling procedure was not completed within 10 seconds. All subsequent re-levelling requests at the same floor are inhibited  | Check:<br>1- the correct operation of the Safety module and of its sensors ZP1 and ZP2;<br>2- Check the FAI/FAS or ENCODER sensors and the ZP sensor;<br>3- position of the magnets in the re-levelling zone;<br>4- RISO relay. |
| 45 | Fault ZP                   |      | Door zone contact stays open when the sensor is in door zone position  | Check the correct operation of the door zone sensor (if present);<br>See Fault # 33   |
| 46 | Multiplex link interrupted |      | In multiplex systems, this fault indicates that the link between two or more controllers in the multiplex loop is missing. Every controller switch to SIMPLEX-like functioning.<br>Cod 0: cable wiring between controller<br>Cod 255: firmware problem   | Check the connection between the controllers (MULX board);<br>Check all multiplex settings.   |
| 47 | Faults memory              |      | Errors in the faults memory  | Erase all faults  |
| 48 | BDU link unavailable       |      | In case of serial communication with floors, indicates the loss of link between the controller and all BDU modules at floors<br><br>On BDUs<br>Green LED fast blinking (0,5 sec): OK<br>Green LED slow blinking (1 sec): OK<br>BDU is not addressed<br>Red LED ON: BDU defective<br>Red LED slow blinking (1 sec): communication not established.<br>Red +Green LED slow blinking (1 sec): sync. | Check:<br>1- BDU connector on screw terminals;<br>2- connection between the controller and the closest BDU;<br>3- the system configuration (§ 5.5)  |

| N. | Fault          | Type | Description   | Remedy   |
|----|----------------|------|---|--|
| 49 | BDU fault      |      | <p>In case of serial communication with floors, indicates the loss of link between the controller and one or more BDU at floors.</p> <p>On the BDU<br/>           GREEN LED fast blinking (0,5 sec): OK<br/>           GREEN LED slow blinking (1 sec): OK BDU not addressed<br/>           RED LED ON: Faulty BDU<br/>           RED LED slow blinking (1 sec): no communication.<br/>           GREEN and RED LEDs slow blinking (1 sec): communication sync in progress.</p> | <p>Check BDU functions and its connections;<br/>           Change defective BDUs;<br/>           Repeat addressing procedure</p> |
| 50 | Drift control  |      | <p>Drift control (if provided) activation: the system is put out of service at an extreme floor</p>   | <p>Reset 82212 in the menu Faults (§ 5.3)</p>  |
| 51 | Wrong Password |      | <p>If the system has a password, this fault appears after entering the wrong password for three times.</p>  |  |
| 52 | Fault VVVF     |      | <p>A fault occurred in the inverter</p> <p>Cod value is the subcode info of VVVF's fault</p>  | <p>Only in case of VVVF FUJI FRENIC LIFT.<br/> <b>See annex IV.</b></p>  |



| N. | Fault       | Type | Description  | Remedy  |
|----|-------------|------|--|---|
| 53 | Fault UCM   |      | <p>UCM Circuit Fault:</p> <p>Cod 1: 81.20 lift with open door maneuvers without UCM solution</p> <p>Cod 2: Brakes open</p> <p>Cod 3: Brakes closed in travel</p> <p>Cod 4: Monitor error GMV NGV A3<br/>RDY = RUN = OFF</p> <p>Cod 5: Monitor error GMV NGV A3<br/>RDY = RUN = ON</p> <p>Cod 6: error Test two valves</p> <p>Cod 8: error Test two valves (START ELEVATOR)</p> <p>Cod. 10: Monitor SMA i-Valve fail (SMA not at 0V)</p> <p>Cod. 11: Monitor SMA i-Valve fail (SMA not at 24V)</p> <p>Cod 12: Monitor Y2 lift in travel</p> <p>Cod 13: Monitor Y2 lift standstill</p> <p>Cod 14: Monitor Y3 lift in travel</p> <p>Cod 15: Monitor Y3 lift standstill</p> <p>Cod 100: UCM Detection</p> <p>Cod 200: Monitor error on RUCM1/RUCM2</p> <p>Cod 201: RUCM1 Stucked Open</p> <p>Cod 202: RUCM2 Stucked Open</p> <p>Cod 203: RUCM3 Stucked Open</p> <p>Cod 204: Monitor OSG A3 (stud stucked in extended position)</p> <p>Cod 210: RUCM1 Stucked Close</p> <p>Cod 220: RUCM2 Stucked Close</p> <p>Cod 230: RUCM3 Stucked Close</p> <p>Cod 240: Monitor OSG A3 (stud stucked in retracted position)</p> | <p>Reset UCM in the menu Faults (§ 5.3).</p> <p>Cod 1: exclude maneuvers with open doors (re-leveling / early opening).</p> <p>Cod 12/13: check wiring and valve Y2 and its monitor signal</p> <p>Cod 14/15: check wiring and valve Y3 and its monitor signal</p> <p>Cod 100: means Unintended Cabine Movement (UCM) detection. If it happens togheter with Fault 41 (Fault ISO) check the sensors ZP1 and ZP2.</p> |
| 54 | Safety zone |      | <p>Only for lift with no car door and safety light curtains.</p> <p>Cod 0: Light curtain active during travel (lift wait for a new Car call to restart)</p> <p>Cod 1: Fail test CEDES door side A</p> <p>Cod 2: Fail test CEDES door side B</p> <p>Cod 10: Fail test on safety relay KSA</p> <p>Cod 20: Fail test on safety relay KSB</p>  | <p>Check circuit according cod's info.</p>  |

| N. | Fault       | Type | Description   | Remedy  |
|----|-------------|------|---|---|
| 55 | Fault SCS   |      | <p>Safety Circuit Shunt.<br/>Function enabled by "Shaft Monitor" parameter. See annex X</p> <p>Cod 2: Second contact door A shunted.<br/>Cod 4: Floor door contacts door A Shunted (SE4 input)<br/>Cod 6: Car door contacts door A Shunted (SE6 input)<br/>Cod 12: Second contact door B shunted.<br/>Cod 14: Floor door contacts door B Shunted (SE4 input)<br/>Cod 16: Car door contacts door B Shunted (SE6 input)<br/>Cod 100: No SE6 input during bypass (ISO Circuit)</p> | <p>Check circuit according cod's info.<br/>Reset SCS parameter in the menu Faults (§ 5.3).</p> <p>Cod 2: Check second contact door A (FFA input for door operator, CEA input for manual cabine door).<br/>Cod 4: Check Floor door's safety contacts door A (SE4 input)<br/>Cod 6: Check Car door's safety contacts door A (SE6 input)<br/>Cod 12: Check second contact door B (FFB input for door operator, CEB input for manual cabine door).<br/>Cod 14: Check Floor door's safety contacts door B (SE4 input)<br/>Cod 16: Check Car door's safety contacts door B (SE6 input)<br/>Cod 100: Check doors bypass Circuit (SE3-SC5).</p> |
| 56 | Fault UAS   |      | <p>Unintended Shaft Access<br/>Function enabled by "Shaft Monitor" parameter.<br/>Must be used BDU with additional door input (could be NO or NC).<br/>System detect a manually floor door opening monitoring the auxiliary door input.</p> <p>Cod 1: One Floor door manually open (with no open door command).<br/>Cod 2: More than one Floor door manually open (at different floors)</p>   | <p>Reset UAS in the menu Faults (§ 5.3).</p>  |
| 57 | Bypass door |      | <p>Only for EN 81-20.<br/>Bypass active on door safety contacts.<br/>(Moving enabled only in inspection)<br/>Check also SM1 module monitor</p> <p>Cod 1: Bypass Car active<br/>Cod 2: Bypass Pre-Locks active<br/>Cod 3: Bypass Locks active<br/>Cod 100: Module SM1 locked</p>   | <p>Cod 100: Module SM1 is checked if only PME selector is active and no STOPS nor direction button pressed: in that condition module SM1 must be not enabled and SE3 input should be open.</p>  |
| 58 | Overspeed   |      | <p>Only for Encoder positioning system.<br/>In inspection or Temporary mode<br/>Lift's speed is more than 0,63 m/s</p>  | <p>Check encoder parameters or inspection speed in positioning menu.</p>  |
| 59 | Fault SHI   |      | <p>Only for 81-21 Pre-triggered device</p> <p>Cod 0: Wrong feedback when pre-triggered device is not energized<br/>Cod 255: Wrong feedback when pre-triggered device is energized</p> <p>Manual protection:<br/>Cod 101: Monitor Relay RMPP (contact doesn't open)<br/>Cod 102: Monitor Relay RMPP (contact doesn't close)</p>  | <p>Check Pre-Triggered Device (or relay RMPP)</p>   |

|    |            |  |   |
|----|------------|--|---|
| 60 | Fault ELGO | <p>ELGO Fault.</p> <p>Cod 0: Upper Limit switch<br/>         Cod 1: Lower Limit switch<br/>         Cod 4: Pre-triggered Stopping system Top<br/>         Cod 5: Pre-triggered Stopping system Bottom<br/>         Cod 8: Normal mode overspeed (pre tripping)<br/>         Cod 9: Normal mode overspeed (final tripping)<br/>         Cod 11: Inspection mode overspeed (final tripping)<br/>         Cod 13: Teach mode overspeed (final tripping)<br/>         Cod 14: Normal mode overspeed (leveling)<br/>         Cod 15: Normal mode overspeed (re-leveling)<br/>         Cod 16: Deceleration control (ETSL)</p> <p>Cod 24: Unintended car movement</p> <p>Cod 100: ELGO not in operative mode</p> <p>Cod 102: ELGO's Input EN81-21 in Manual Teach mode<br/>         Cod 103: ELGO's eSGC_POW missing in Manual Teach mode<br/>         Cod 104: Restarting error in Manual Teach mode</p> <p>Cod 121: Input ELGO 81.21 not matching (all time OFF)<br/>         Cod 122: Inputs ELGO UP/DOWN (not active)<br/>         Cod 123: Input ELGO UP not matching<br/>         Cod 124: Input ELGO DOWN not matching<br/>         Cod 125: Inputs ELGO UP/DOWN not matching (all time ON)</p> <p>Cod 200: Communication time out</p> <p>Cod 254: Self test ELGO Error Level 4</p> <p>Cod 255: Magnetic Band missing</p> | <p>Check ELGO configuration data.</p> <p>Check ELGO wiring</p> <p>Make a Fault reset to remove the fault.</p> <p>Cod 0: Move car down (under the limit switch position) and make a specific Reset SE3 fault (§5.3).<br/>         Cod 1: Move car up (over the limit switch position) and make a specific Reset SE3 fault (§5.3).<br/>         Cod 4: only information, Inspection upper limit switch.<br/>         Cod 5: only information, Inspection lower limit switch.<br/>         Cod 8/9: Make a Fault reset. Check Lift speed and ELGO's Configuration.<br/>         Cod 11: Make a Fault reset. Check Lift speed and ELGO's Configuration.</p> <p>Cod 13: Make a Fault reset. Reduce the lift speed in Teach mode (max 0,6 m/s).<br/>         Cod 14: Make a Fault reset. Reduce the lift speed during the stop at floor (max 0,8 m/s).<br/>         Cod 15: Make a Fault reset. Reduce the lift speed in re-leveling (max 0,3 m/s).</p> <p>Cod 16: Fault is automatically removed when lift is standstill. Increase Deceleration distances (R1D/R1S).</p> <p>Cod 20: In Inspection, on the lower limit switch a down movement checked with a UP command. Check rollback effect.</p> <p>Cod 21: In Inspection, on the higher limit switch an up movement checked with a DOWN command. Check rollback effect.</p> <p>Cod 100: Need a Manual Teach procedure</p> <p>Cod 102: Check wiring of ZP2 signal in the controller</p> <p>Cod 103: Check wiring of cable eSGC (power missing)</p> <p>Cod 104: Need Change device</p> <p>Cod 121: Check wiring of ELGO and TOC's signal output. Error means a mismatch between command from controller and ELGO's diagnostic.</p> <p>Cod 121 ⇔ 125: Check wiring of ELGO and TOC's signals output. Errors means a mismatch between commands from controller and ELGO's diagnostic.</p> |
|----|------------|--|---|

| N. | Fault | Type | Description | Remedy  |
|----|-------|------|-------------|---|
|    |       |      |             | <p>Cod 200: Check wiring TOC- ELGO (Can signals)</p> <p>Cod 254: Noise on eSGC signal's cable. Put a relay on TOC box to open the load line when eSGC output is not active.</p> <p>Cod 255: Check mounting of the magnetic band and mounting direction as well.</p> |



This symbol means a blocking fault: switch off main power and then switch it on again to put the lift back in service.

## ANNEX II: Test and measures

The following tests and measures may facilitate controls and tests to be performed before putting the installation in service (EN81-X D) and during the periodic maintenance interventions (EN81-X E). Some measures can be performed only through the encoder counting system.

Tests can be performed only if the installation is in normal operation mode; select parameter "test" to perform the test and press ENTER to start it. The test procedure can be stopped by switching the installation to inspection mode.

### **Test 1: Measure of the stopping space and time in UP direction, DMG UCM module in acceleration out of the door zone**

Before starting the test, move the empty car to the floor where you want to take the measure.

During the test, the car will move upwards until the end of that floor door zone; now the forced intervention of the UCM module is activated and the car will thus stop. After the car has stopped, the distance covered from the floor level is shown (to be compared to point 5.6.7.5 of EN81-20) and the stopping time since the UCM activation. Important: the stopping distance must be calculated before, considering the sum of intervention times (controller + stopping unit). After the test, the UCM module must be reset (menu <Faults> reset UCM).

### **Test 2: Measure of the stopping space and time in DOWN direction, DMG UCM module**

Before starting the test, move the empty car to the floor where you want to take the measure.

During the test, the car will move downwards until the end of that floor door zone; now the forced intervention of the UCM module is activated and the car will thus stop. After the car has stopped, the distance covered from the floor level is shown (to be compared to point 5.6.7.5 of EN81-20) and the stopping time since the UCM activation. Important: the stopping distance must be calculated before, considering the sum of intervention times (controller + stopping unit). After the test, the UCM module must be reset (menu <Faults> reset UCM).

### **Test 3: Measure of the stopping space and time in UP direction at rated speed**

Before starting the test, move the empty car to the ground floor.

During the test, the car will move upwards up to the second last floor (AGH for two stops installations); now the car stops. After the car has been stopped, the distance covered from the second last floor and the stopping level and the stopping time are shown.

### **Test 4: Measure of the stopping space and time in DOWN direction at rated speed**

Before starting the test, move the full loaded car to the top floor.

During the test, the car will move downwards up to the first floor (AGB for two stops installations); now the car stops. After the car has been stopped, the distance covered from the first floor and the stopping level and the stopping time are shown.

### **Test 5: Re-leveling test with too high car (EN 81 point 14.2.1.2)**

Before starting the test, move the car to the floor where you want to take the measure.

During the test, the car will move upwards until the re-leveling function is activated; now the car is re-leveled. After the car has stopped, the distance at which the re-leveling starts and the intervention time are shown. We recommend to perform the test at each floor to check the correct installation of the re-leveling sensors.

### **Test 6: Re-leveling test with too low car (EN 81 point 14.2.1.2)**

Before starting the test, move the car to the floor where you want to take the measure.

During the test the car will move downwards until the re-leveling function is activated; now the car is re-leveled. After the car has stopped, the distance at which the re-leveling starts and the intervention time are shown. We recommend to perform the test at each floor to check the correct installation of the re-leveling sensors.

### **Test 7: Final limit switch test (EN 81 point 10.5)**

Before starting the test, move the car to the ground or top floor.

During the test the car will move towards the shaft end until the safety chain opens (or until the FCO input is detected). After the car has stopped, the distance between the intervention floor and the limit switch intervention and the status of FCO input (NO contact for registering the limit switch intervention) are shown. The car can be moved beyond the limit switch through the inspection

control panel in the machine room (in inspection mode the movement beyond the top and bottom floor is disabled) to put the car or the counterweight on the shock absorbers and perform the rope slipping test. Move the car out of the limit switch area and put the installation in normal operation mode (if the second NO contact of the FCO input is connected, you must reset FCO in the menu <Faults>).

### Test 8: Motor run time test (EN 81 point 12.10)

Before starting the test, move the car to the ground or top floor.

During the test the car will move towards the opposite extreme floor at null speed. After 5 seconds, the up/down run time error will be detected (check in the menu <Faults>). Clear all errors to put the installation in normal operation mode again.

### Test 9: System balancing test

Before starting the test, place the cab on the ground floor with the weight suited to balance the system itself (typically 50% of the maximum load). During the test the cabin will start in the direction of the highest floor and the absorbed current at the middle of the shaft will be displayed. The cabin will then move to the lowest floor, once again displaying the absorbed current at the middle of the shaft. The values will also be preserved after the end of the test for evaluation purposes.

### Test 10 ⇔ Test 17: Not Used

### Test 18: Door Disable

Test for temporarily disabling door operators.

Test is useful if technician needs to make some test with lift in normal mode but without the risk some user can enter in the car.

It is possible to program a time of 1/5/10/30/60 minutes.

Time is valid also if Lift will be put in inspection / Normal again.

At the end of timer, lift comes back in normal mode.

### Test 19: Black out Simulation

Only for installation with full emergency option. Lift behaviour is the same you have when power supply goes off, so it make an automatic emergency moving the car to the floor and opens the door.

### Test 20: Telephon call for low batteries level simulation

Controller send command to DMCPIT (output ALARM Enable) as if the battery level was wrong for an emergency call. This signal has to be connected to the telephone's input for emergency call.

### Test 21: Simulation of system shutdown need (ELGO or VVVF system only)

The system simulate a long time without any shutdown.

-) at first execution, system simulate a switch-on beyond 9 months (270 days), as an effect only the information defect "1 = Reset Cod 9". In the Errors menu DAY COUNTER = 270 is displayed. Lift continues to operate regularly.

-) at second execution, system simulate a switch-on over 12 months (365 days), as an effect the blocking fault "1 = Reset Cod 12". The lift stops at the floor without being able to take further calls. In the Errors menu DAY COUNTER = 365 is displayed. To return in normal operation, the main power switch must be turned off and then on again.

### Test 22: Integrated Weighing Calibration Procedure (VVVF system only)

The Test must be repeat twice, the first for the full load (100%), the second time (110%) for the overload measurement.

Before starting the test, place the cabin on the ground floor or on the top floor.

Select in order:

-) Test 22 - 100%: Put into the car the FULL LOAD. When you confirm the test lift automatically will make a start from each floor in both direction. During the test doors will not be enabled to keep constant load into the cabin. Test finish when the cabin come back to the starting floor and door opens. On the Playpad is showed "End reg."

-) Test 22 - 110%: Add into the car 10% of the load with a mininum of 75 Kg. When you confirm the cabin close the door (without moving from the floor) and the overload will be activated (and so the door will be open. On the Playpad is showed "End reg."

After the Calibration procedure check the status of parameter “Integrated Load Weighing” in menu <Special Features>.



Calibration Procedure Must be repeated in case of any changing into the cabin (panels, flooring, COP changing etc.) or on the counterweight (lift balancing).

### **Test 23: Measure of the stopping space and time in UP direction at rated speed with Safety Gear (only OSG A3)**

Before starting the test, move the empty car to the ground floor.

During the test, the car will move upwards and after reaching the nominal speed, as soon the car reach the first floor (AGH for two stops installations) the controller removes the OSG's A3 pin causing the stop of the lift. After the car has been stopped, the distance covered from the second last floor and the stopping level and the stopping time are shown. To control only the safety gear as a locking system, when starting the lift keep the brakes energized by manually operating the contactors.

### **Test 24: Measure of the stopping space and time in DOWN direction at rated speed with Safety Gear (only OSG A3)**

Before starting the test, move the full loaded car to the top floor.

During the test, the car will move downwards and after reaching the nominal speed, as soon the car reach the first floor (AGB for two stops installations) the controller removes the OSG's A3 pin causing the stop of the lift. After the car has been stopped, the distance covered from the second last floor and the stopping level and the stopping time are shown. To control only the safety gear as a locking system, when starting the lift keep the brakes energized by manually operating the contactors.

### **Test 25 ↔ Test 26: Not Used**

### **Test 27: Check of landing doors locked from the cabine**

It is useful in order to check that landing doors are locked. It is executed with a special key in the car to check landing doors at penthouse floor. Test will move the cabine 300 mm over the floor level (under floor level at the top floor) and opens the cabine's door. During the test an intermittent acoustic signal sounds in the cabine.

Test finish after a maximum of 60 seconds or when a second activation on the special key is given. Technician can moves the lift by a COP call.

Test can be also executed by the Playpad at each floor.

After the test lift come back in service.



## ANNEX III: Instructions for Software update



Open safety chain during SW update procedures. (DIS switch = OFF)

### PlayPad (PLP) SW update procedure

SW update file for PLP depends on which Playpad is installed:



**PLAYPAD:** FileName.PP2



**PLAYPAD WiFi:** FileName.PP4

Insert the USB device into the slot, waiting for the message as in the Figure 1.

Select "Put a file into PlayPad" (default), press OK button. Window changes into Figure 2.

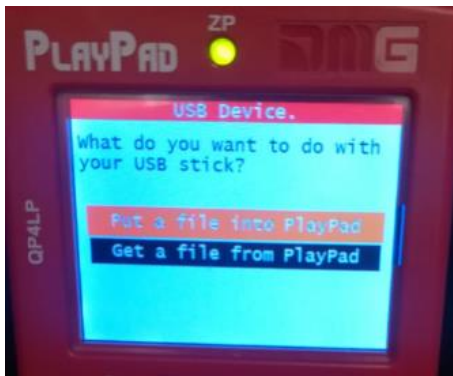


Figure 1



Figure 2

Follow the instruction on screen and select the .PP2 file (in the example PLP2\_2.PP2) and press OK. Window changes into Figure 3.

Press OK to confirm the update process. Window changes into Figure 4.



Figure 3



Figure 4

At the end of Procedure you have to remove the USB (Figure 5 or Figure 6 will be appear)



Figure 5

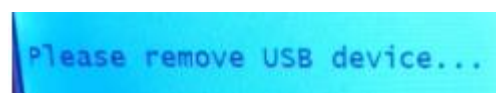


Figure 6



## Devices SW update procedure

Insert the USB device into the slot, waiting for the message as in the Figure 7 and Select “Put a file into PlayPad” (default) and press OK button. Window changes into Figure 8.

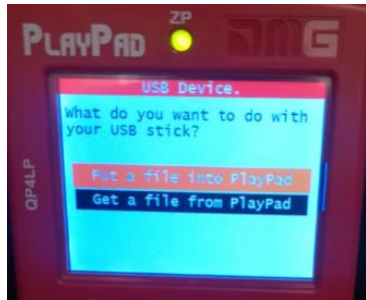


Figure 7



Figure 8

Follow the instruction on screen and select the \*.bin file and press OK. Window changes into Figure 9. Press OK to confirm the update process. Window changes into Figure 10, wait for a while.



Figure 9



Figure 10

Select the Device (or device group) to update and press OK (Figure 11). Window changes into Figure 12: wait until the process is completed. If you need to press any arrow button to switch on the backlight.



Figure 11



Figure 12

When the process ends (Figure 13) press Esc button until the window shows “Please remove USB Device” (Figure 14).



Figure 13



Figure 14

| Device                                      | Time needed for updating SW |
|---|-----------------------------|
| Mother board (Playboard Controller)         | 3 minutes                   |
| PlayPad 4.0                                 | 1 minute                    |
| TOC Board (Car TOP Interface)               | 1 minute                    |
| DMCPIT Board (Car COP Interface)            | 1 minute                    |
| Serial Pushbuttons Interfaces (BDU Devices) | 30 seconds                  |
| Expansion boards (PIT8 / 16RL / 16IO)       | 30 seconds                  |

Table III.1 – Timing for SW update

## ANNEX IV: VVVF Frenic Lift Setting

### Motor Tuning (VVVF Controller)

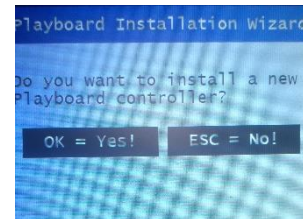
In the case of a Controller equipped with electric inverter Fuji FRENIC Lift, the self-learning procedure of motor data ("Tuning") must be performed. This must be carried out in order to align the functioning of the drive to the electrical characteristics of the motor on site. The tuning procedure must be done in temporary operation. The procedure is different according to the type of Motor.



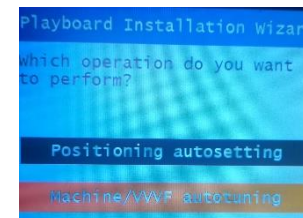
#### Tuning procedure

Select Installation Menu (see icon);

In the Screen will appear:



Confirm by pressing OK and select "Machine / VVVF Autotuning:



Insert the requested parameter and move on to the next one by pressing the Right Arrow.

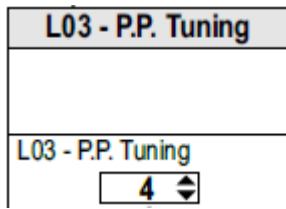
The list of VVVF Parameter is:

| Parameter                 |                    | Description   | Gearless Motor | Geared Motor |
|---------------------------|--------------------|---|----------------|--------------|
| P01 – Motor Poles         |                    | Insert Motor Pole's number                          | X              | X            |
| F03 – Maximum Speed       |                    | Insert max motor Speed [RPM]<br>(Motor Plate)       | X              | X            |
| F04 – Rated Current       |                    | Insert Rated motor speed [Hz]<br>(Motor Plate)      | X              | X            |
| F05 – Rated Voltage       |                    | Insert Rated motor voltage [V]<br>(Motor Plate)     | X              | X            |
| P08 – M-%X                |                    | Insert value 10 %                                   | X              |              |
| P07 – M-%R1               |                    | Insert value 5 %                                    | X              |              |
| P06 – M-No Load Curr.     |                    | Insert value 0 [A]                                  | X              |              |
| P03 – Motor Rated Current |                    | Insert rated current [A]<br>(Motor Plate)           | X              |              |
| P02 – Motor Rated Cap     |                    | Insert rated power [kW]<br>(Motor Plate)            | X              |              |
| ACE INVERTER              | LM2 INVERTER       |   |                |              |
| C05 – High Speed          | C11 – High Speed   | Insert high speed [Hz]<br>(Motor Plate)             | X              | X            |
| C10 – Middle Speed        | C10 – Middle Speed | Insert middle speed [Hz]<br>(Inspection speed)      | X              | X            |
| C08 – Creep Speed         | C07 – Creep Speed  | Insert low speed [Hz]<br>(10% of C11)               | X              | X            |
| L01 – PG select           |                    | Set motor Encoder type:<br>(\$VVVF Optional Boards) | X              | X (*)        |
| L02 – PG resolution       |                    | Insert Motor Encoder Resolution                     | X              | X (*)        |

(\*) only closed loop)

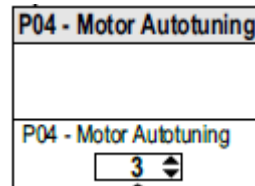
Last parameter is different according Motor Type:

### Gearless Motor



Select:  
4 = Static Tuning  
5 = Dynamic tuning  
(only if free from ropes)

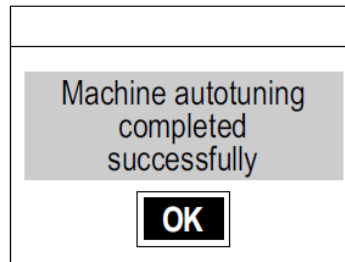
### Geared Motor



Select:  
3



After setting the last parameter, press Right and follow the instructions shown: keep pressed the requested button on the PME for the time indicated.



In case of positive show: and the procedure is finished.

Tuning playpad will

### In case of any problem go to the Fault menu to identify the Problem (§ Motor Tuning Errors)

At the end of the procedure, press the up/down button and check the correct car movement direction; if not correct, invert values of parameters E98 and E99.

For closed loop installations, in the <I/O Status>, VVVF IN/OUT menu, check that the VVVF motor encoder value (4/7) is positive (+) during upward movement and negative (-) during downward movement when the FWD (1/7) command is activated. If not, invert a channel in the motor encoder of the VVVF.

## VVVF Optional Boards

| L01 | Encoder specifications     |                      | Encoder board     | Motor     |
|-----|----------------------------|----------------------|-------------------|-----------|
|     | Incremental signals        | Absolute signals     |                   |           |
| 0   | Open collector / Push-Pull | -                    | OPC-PG3           | IM        |
|     | Line Driver                | -                    | OPC-PMPG          |           |
| 1   | Open collector / Push-Pull | Z                    | OPC-PG3           | IM & PMSM |
| 4   | Sine differential (1Vpp)   | EnDat2.1 (ECN1313)   | OPC-PS or OPC-PSH | PMSM      |
| 5   | Sine differential (1Vpp)   | ERN1387              | OPC-LM1-PR        | PMSM      |
| 6   | Sine differential (1Vpp)   | BISS-C (Sendix 5873) | OPC-PS or OPC-PSH | PMSM      |
| 7   | Sine differential (1Vpp)   | SSI (ECN1313)        | OPC-PS or OPC-PSH | PMSM      |
| 8   | Sine differential (1Vpp)   | Hiperface (SRS50)    | OPC-PSH           | PMSM      |



# JUNIOR 4.0

*User  
Manual*

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## VVVF Fault Table

| Code  | Description                                    |   |
|-------|--|---|
| OC1   | Overcurrent during acceleration                | The inverter momentary output current exceeded the overcurrent level.   |
| OC2   | Overcurrent during deceleration                |   |
| OC3   | Overcurrent during running at a constant speed |   |
| EF    | Ground fault                                   | Zero-phase current caused by ground fault in the output circuit has exceeded the allowable limit. (30kW or above)                             |
| OV1   | Overvoltage during acceleration                | The DC link bus voltage exceeded the overvoltage detection level.   |
| OV2   | Overvoltage during deceleration                |   |
| OV3   | Overvoltage during running at a constant speed |   |
| LV    | Undervoltage                                   | The DC link bus voltage dropped below the undervolt detection level.  |
| Lin * | Input phase loss                               | An input phase loss occurred or the Interphase voltage unbalance rate was large.  |
| OH1   | Heat sink overheat                             | The temperature around the heat sink has risen abnormally.  |
| OH2   | External alarm                                 | The external alarm <b>THR</b> was entered. (when the <b>THR</b> "Enable external alarm trip" has been assigned to any digital input terminal) |
| OH3   | Inverter internal overheat                     | The temperature inside the inverter has exceeded the allowable limit.   |
| OH4   | Motor protection (PTC/NTC thermistor)          | The temperature of the motor has risen abnormally.  |
| DBH   | Braking register overheat                      | The temperature of the Braking resistor has exceeded allowable limit.   |
| OL1   | Overload of motor 1                            | The electronic thermal protection for motor overload detection was activated.   |
| OLU   | Inverter overload                              | The temperature inside the IGBT has risen abnormally.   |
| OS    | Over speed prevention                          | The motor speed is higher than maximum speed * L32.   |
| PG    | Broken wiring in the PG                        | The inverter detects a broken wiring connection in encoder. the pulse   |
| nrb   | NTC wire break error                           | Detected a wire break in the NTC thermistor detection circuit.  |
| Er1   | Memory error                                   | An error has occurred when writing data to the inverter memory.   |
| Er2   | Keypad communications error                    | A communications error has occurred between the key and the inverter. pad   |
| Er3   | CPU error                                      | A CPU error or LSI error has occurred.  |
| Er4   | Option communications error                    | A communications error has occurred between the connected option card and the inverter.   |
| Er5   | Option error                                   | An error was detected by the connected option card (not by the inverter).   |
| Er6   | Operation protection                           | An incorrect operation was attempted.   |
| Er7   | Tuning error                                   | Auto-tuning or Magnetic Pole Position Offset tuning has failed, resulting in abnormal tuning results.   |
| Er8   | RS-485 communications error (port 1)           | A communications error has occurred during RS-485 communication.  |
| ErP   | RS-485 communications error (port 2)           |   |
| OPL   | Output phase loss                              | An output phase loss occurred.  |
| ErE   | Speed mismatching                              | The reference speed and the detection speed are different.  |
| ErF   | Data saving error during undervoltage          | When the undervoltage protection was activated, the inverter failed to save data, showing this error.   |

| Code | Description                              |   |
|------|--|---|
| ErH  | Hardware error                           | The LSI on the power printed circuit board has malfunctioned due to noise, etc.                                       |
| Ert  | CANopen communication error              | A communications error has occurred during CANopen communication.   |
| ECF  | EN1, EN2 terminals circuit error         | An abnormality was diagnosed in EN1, EN2 terminals circuit.   |
| Ot   | Over torque current                      | Reference torque current became excessive.  |
| DBA  | Braking transistor broken                | Detection of an abnormality in the brake transistor   |
| bbE  | Brake confirmation                       | The inverter detects mismatch between the brake control signal and brake detection (feedback) signal.                 |
| Eo   | EN1, EN2 terminals chattering            | Detected collision between ENOFF output and EN1/EN2 terminals. input  |
| ECL  | Customizable logic error                 | A customizable logic configuration error has caused an alarm.   |
| OH6  | Charging resistor overheat               | The temperature of the charging resistor inside the has exceeded the allowable limit. inverter                        |
| rbA  | Rescue by brake alarm                    | No movement detected during rescue operation by bra control. ke   |
| tCA  | Reaching maximum numbers of trip counter | The number of trip direction changes has reached the preset level.  |
| SCA  | Short-circuit control error              | The inverter detects mismatch between the short-circuit control signal and short-circuit detection (feedback) signal. |
| LCO  | Load-cell overload                       | Load-cell function has detected overload situation by means of preset level.  |

## VVVF Alarm Sub code Table

| Code | Alarm Name                        | Sub Code | Description                                    |
|------|-----------------------------------|----------|--|
| OC1  | Overcurrent during acceleration   | 1        | Overcurrent protection (OCT interruption)      |
|      |                                   | 2        | Overcurrent protection (OCL interruption)      |
| OC2  | Overcurrent during deceleration   | 3        | Short circuit protection                       |
|      |                                   | 4        | Ground fault protection                        |
| OC3  | Overcurrent during constant speed | 5        | Detection signal failure (FAULT signal)        |
|      |                                   | 11       | Detection signal failure (OCT signal)          |
|      |                                   | 12       | Detection signal failure (OCL signal)          |
| OV1  | Overvoltage during acceleration   | 1        | Overvoltage Protection (OVT signal)            |
| OV2  | Overvoltage during deceleration   |          |  |
| OV3  | Overvoltage during constant speed |          | 11   |
| Lin  | Input phase loss                  | 1        | Rectifier diode protection level detection     |
|      |                                   | 2        | Continuous operation tolerance level detection |
| OPL  | Output phase loss                 | 1        |  |
| OH1  | Cooling fin overheat              | 1        | Cooling fin overheat (NTC2)                    |
|      |                                   | 3        | Converter overheat (NTC4)                      |
|      |                                   | 11       | Thermistor disconnection (NTC2)                |
| OH2  | External fault                    | 0        | Protection through THR                         |
| OH3  | Overheat inside inverter          | 0        | Internal air overheat (NTC1)                   |

| Code | Alarm Name                        | Sub Code | Description  |
|------|-----------------------------------|----------|--|
| OH4  | Motor Protection (PTC thermistor) | 1        | PTC thermistor   |
|      |                                   | 2        | NTS thermistor   |
| OH6  | Charging resistor overheat        | 1        | Charging resistor overheat<br>Except for FRN0039LM2A-4 / FRN0045LM2A-4 |
|      |                                   | 11       | Thermistor disconnection (NTC3)  |
| OL1  | Motor overload                    | 0        | Current detection electronic thermal                                   |
| LV   | Undervoltage                      | 1        | Undervoltage is occurred during gate ON                                |
|      |                                   | 11       | Minimum level of battery operation                                     |
| dbH  | DB resistor overheat              | 0        | DB resistor overheat   |
|      |                                   | 1        | DB transistor 2sec_ON continuously                                     |
| dbA  | DB transistor failure detection   | 0        | DB transistor failure detection  |
| Er1  | Memory Error                      | 0x0001   | Alarm history destruction  |
|      |                                   | 0x0002   | Standard function code   |
|      |                                   | 0x0004   | User function code   |
|      |                                   | 0x0008   | Hidden function code   |
|      |                                   | 0x0010   | Program area error   |
|      |                                   | 0x0040   | Reading mismatch (retry over)  |
|      |                                   | 0x0080   | Writing mismatch (retry over)  |
|      |                                   | 0x0100   | Extended area  |
|      |                                   | 0x1000   | Adjustment value area  |
| Er2  | Keypad panel communication error  | 1        | Disconnection detection  |
| Er3  | CPU error                         | 1        | CPU re-start processing  |
|      |                                   | 1000     | Function code checksum error (RAM error)                               |
|      |                                   | 0x0001   | Standard function code error   |
|      |                                   | 0x0002   | Hidden function code (u code) error                                    |
|      |                                   | 0x0004   | Hidden function code (n code) error                                    |
|      |                                   | 0x0008   | Adjustment valve function code error                                   |
|      |                                   | 0x0010   | Extended area  |
|      |                                   | 2000     | Fixed-cycle error  |
|      |                                   | 0x0001   | L1 cycle error   |
|      |                                   | 0x0004   | L3 cycle error   |
|      |                                   | 0x0008   | L4 cycle error   |
|      |                                   | 0x0020   | L6 cycle error   |
|      |                                   | 0x0080   | LP cycle error   |
|      |                                   | 3000     | Unjust cut in  |
|      |                                   | 5001     | Outside RST input  |
|      |                                   | 7001     | Stack area destruction   |
|      |                                   | 9000     | Software failure detection   |
|      |                                   | 0x0200   | Alarm QUE over   |



| Code | Alarm Name                       | Sub Code | Description  |
|------|----------------------------------|----------|--|
| Er4  | Option communication error       | 1        | Port A communication error<br>There is no option       |
|      |                                  | 3        | Port C communication error                             |
|      |                                  | 10       | An excess of installed option<br>There is no option    |
| Er5  | Option error                     | 0        | Option in-match  |
|      |                                  | 1        | Completion signal ON (There is no option)              |
|      |                                  | 10       | AIO PT EEPROM error (There is no option)               |
|      |                                  | 26       | PR-PP position information error (only OPC-PMPG+L01=2) |
|      |                                  | 27       | PP position information starting error                 |
|      |                                  | 50       | No save area   |
|      |                                  | 51       | Communication command error                            |
|      |                                  | 52       | Distinction code error                                 |
|      |                                  | 53       | Check-sum error  |
|      |                                  | 54       | Writing error  |
| Er6  | Operation procedure error        | 2        | Start check  |
|      |                                  | 7        | Multi speed assigned error                             |
|      |                                  | 8        | Brake check (waiting time timeout)                     |
|      |                                  | 9        |  |
|      |                                  | 10       | No try magnetic pole position tuning                   |
|      |                                  | 11       | Output side contactor confirmation error               |
|      |                                  | 12       | Lack of rating speed                                   |
|      |                                  | 14       | Brake check (assigned error)                           |
|      |                                  | 15       | Short circuit (SCC assigned error)                     |
|      |                                  | 16       | Rescue error   |
| Er7  | At induction motor tuning        | 1        | R1 phase (between phase) unbalance                     |
|      |                                  | 2        | R1 phase error   |
|      |                                  | 3        | %X error   |
|      |                                  | 6        | Output current error                                   |
|      |                                  | 7        | Drive command OFF                                      |
|      |                                  | 9        | BX terminal ON   |
|      |                                  | 11       | Undervoltage (LV) detection                            |
|      |                                  | 15       | Alarm occur  |
|      |                                  | 16       | Change of drive command                                |
|      |                                  | 19       | Others   |
|      |                                  | 21       | I0 error   |
|      |                                  | 24       | EN terminal  |
|      |                                  | 25       | DRS terminal   |
| Er7  | At current detection gain tuning | 32       | EEPROM writing error                                   |
|      |                                  | 37       | STOP key_ON  |
|      |                                  |          |  |

| Code | Alarm Name  | Sub Code | Description  |
|------|---|----------|--|
| Er7  | At magnetic pole position offset tuning                 | 51       | Tuning without motor                                 |
|      |   | 52       | Magnetic pole position tuning result error           |
|      |   | 53       | F42 setting miss                                     |
|      |   | 54       | L04 mismatch   |
| Er7  | At current detection offset tuning                      | 61       | EEPROM writing error                                 |
|      |   | 62       | STOP key_ON  |
| Er7  | Synchronous motor tuning error                          | 5058     | Amature resistance error (lower limit)               |
|      |   | 5059     | Amature resistance error (upper limit)               |
|      |   | 5060     | Ld error (lower limit)                               |
|      |   | 5061     | Ld error (upper limit)                               |
|      |   | 5062     | Lq error (lower limit)                               |
|      |   | 5063     | Lq error (upper limit)                               |
|      |   | 5080     | ACR gain error (upper limit)                         |
|      |   | 5081     | ACR gain error (lower limit)                         |
| Er8  | RS485 communication error                               | 0        | CH1 RS485 communication error                        |
| nrb  | NTC thermistor disconnection detection                  | 0        | NTC thermistor disconnection detection               |
| OS   | Overspeed   | 0        | Overspeed protection                                 |
| Pg   | PG error  | 1        |  |
|      |   | 2        |  |
|      |   | 50       | Option – A/B phase (Sin) disconnection detection     |
|      |   | 51       | Option – C/D phase (Sin) disconnection detection     |
|      |   | 52       | Option – R phase (Sin) disconnection detection       |
|      |   | 53       | Option – A/B phase (pulse) disconnection detection   |
|      |   | 54       | Option – Z phase (pulse) disconnection detection     |
|      |   | 55       | Option – U/V/W phase (pulse) disconnection detection |
|      |   | 60       | Option – watchdog time out                           |
|      |   | 61       | Option – serial encoder response time out            |
|      |   | 62       | Option – CPU communication CRC error                 |
|      |   | 63       | Option – CPU out of communciation error              |
|      |   | 70       | Option – ABZ output error                            |
|      |   | 71       | Option – serial encoder each alarm                   |
|      |   | 72       | Option - memory access error                         |
|      |   | 73       | Option – culcuration error                           |
|      |   | 80       | Option – PG card setting error                       |
|      |   | ErE      | Speed mismatch<br>(speed deviation excess)           |
| 3    | Speed deviation exces (speed detection > speed command) |          |  |
| 5    | Speed detection continues being 0                       |          |  |
| 7    | Speed deviation exces (speed detection < speed command) |          |  |
| ErF  | Undervoltage data save error                            | 0        | Undervoltage data save error                         |
| ErP  | RS485 2ch<br>communication error                        | 0        | CH2 RS485 communication error                        |

| Code | Alarm Name                      | Sub Code | Description   |
|------|---------------------------------|----------|---|
| Ert  | CAN communication error         | 1        | Bus-off   |
|      |                                 | 2        | Guarding timeout detection                                |
| OLU  | Inverter overload               | 1        | IGBT protection   |
|      |                                 | 2        | Inverter thermal<br>Only FRN0060LM2A-4 ⇔ FRN0091LM2A-4    |
|      |                                 | 10       | $\Delta T_{j-c} \geq 60 \text{ }^\circ\text{C}$           |
| ECF  | EN circuit error                | 10       | EN input error (_EN1A=L, EN2A=L)                          |
|      |                                 | 11       | EN input error (_EN1A=H, EN2A=H)                          |
|      |                                 | 5000     | Diagnosis circuit error                                   |
|      |                                 | 5010     | P5S power supply failure                                  |
|      |                                 | 5020     | CPU diagnosis: Port setting diagnosis                     |
|      |                                 | 5030     | CPU diagnosis: ROM diagnosis                              |
|      |                                 | 5040     | CPU diagnosis: RAM diagnosis                              |
|      |                                 | 5050     | CPU diagnosis: sequence monitor                           |
| ECL  | Customization logic malfunction | 0        | Customization logic error                                 |
| Err  | Simulated failure               | 9998     | Simulated failure   |
| Ot   | Torque excessive error          | 0        | Torque excessive error                                    |
| bbE  | Mechanical brake error          | 11       | BRAKE1 error  |
|      |                                 | 12       | BRAKE2 error  |
| Eo   | EN terminal error               | 0        | EN terminal error   |
| rbA  | Rescue speed detection error    | 0        | Rescue speed detection error                              |
| tCA  | Direction switch limit arrival  | 0        | Direction switch limit arrival                            |
| SCA  | Short circuit error             | 0        | Short circuit error                                       |
| Lco  | Load cell error                 | 0        | Load cell error   |
| EF   | Ground protection               | 0        | Three phase current<br>Only FRN0060LM2A-4 ⇔ FRN0091LM2A-4 |

## Motor Tuning Errors

### GEARED MOTOR

In old motors the auto-tuning may fail: in these cases the auto-tuning type 1 (at point 10 select P04 = 1) can be executed but in this case the values P06 and P12 must be manually entered.

$$P06 = \sqrt{(P03)^2 - \left(\frac{P02 * 1000}{1.47 * F05}\right)^2}$$

Typical values of P06 are between 30% and 70% of P03.

$$P12 = Frequency_{RATED} * \left( \frac{Speed_{SYNCHRONOUS} - Speed_{RATED}}{Speed_{SYNCHRONOUS}} \right) * 0,7$$

Acceptable values of P12 are between 0.5 and 5 Hz.

For instance, for a 4-pole motor, the Rated Frequency is 50 Hz, the synchronous speed is 1500 rpm and the Rated Speed is on the motor nameplate (always in revolutions per minute).

### GEARLESS MOTOR

In case of a problem "Error 52 = er7 Error VVVF" will show in the MENU ERRORS. In this case please check the connections of the motor encoder, clear the errors in the "Errors" menu and repeat the poletuning procedure from point 14.

After the poletuning procedure try to move the elevator in maintenance in up and down for some motor revolutions. If it moves correctly the procedure is over, otherwise, in the event of an error of the VVVF (ere or Ocx or Os), reverse the two motor phases changing the VVVF's H190 parameter, clear the errors in the "Fault" menu and repeat the poletuning procedure.

## ANNEX V: Rollback control and ride comfort

When the Playboard controller is applied to installations equipped with closed loop gearless machines, comfort and precision can be optimized thus avoiding undesired effects such as rollback (typical of lifts with unbalanced load).

The following parameters can be adjusted to achieve optimal setting for your installation. It is suggested to follow the procedure from start to end in the proposed sequence.

### Starting phase adjustments

Adjust the following Parameters to compensate for other undesired effects

| PAR. | DESCRIPTION   | DEFAULT  |         | SUGGESTED ADJUSTMENTS  |
|------|---|----------|---------|--|
|      |   | Gearless | Geared  |  |
| H64  | Zero speed control time   | 0,8      | 0,8     | Set value between 0,7 and 0,8 then increase to soften start phase ramp<br><b>Important:</b> In "Positioning" Menu :<br><b>Delay DIR-BRK</b> <= 0,2 s<br><b>Delay BRK-S</b> > H64 |
| L68  | RBC Proportional Gain (P constant)<br><i>(specifies the P constant of the Automatic Speed Regulator to be used during RBC calculation time)</i> | 1,8      | 10      | <b>Motor overshoots:</b> increase value by <b>0,25</b><br><b>Vibrations:</b> decrease value by <b>0,25</b>   |
| L69  | RBC Integral Time (I constant)<br><i>(specifies the I constant of the Automatic Speed Regulator to be used during RBC calculation time)</i>     | 0,003 s  | 0,010 s | <b>Motor overshoots:</b> decrease value by <b>0,001</b><br><b>Vibrations:</b> increase value by <b>0,001</b>   |
| L73  | Unbalanced load compensation<br><i>(specifies the I constant of the Automatic Position Regulator to be used during RBC calculation time)</i>    | 0,5      | 0       | <b>Motor overshoots:</b> increase value by <b>0,50</b><br><b>Vibrations:</b> decrease value by <b>0,50</b>   |
| L82  | ON delay time<br><i>(specifies the delay time during which the inverter main circuit is kept activated)</i>                                     | 0,2 s    | 0,2 s   | <b>Larger Brakes:</b> decrease value by <b>0,1</b><br><b>Smaller brakes:</b> increase value by <b>0,1</b>  |

**Notes:** L65 specifies whether to enable or disable the unbalanced load compensation (Rollback control). By default, it is set to 1 (Rollback control active). Speed is kept at zero when brakes are released to avoid rollback effect.

## High speed phase adjustments

High speed "P" gains and "I" time constants are used by the Auto Speed Regulator (ASR) of the inverter during high speed lift travel. These constants can be adjusted as follows:

| PAR. | DESCRIPTION                       | DEFAULT  |         | SUGGESTED ADJUSTMENTS   |
|------|-----------------------------------|----------|---------|---|
|      |                                   | Gearless | Geared  |   |
| L24  | "S" Curve setting 6               | 25%      | 25%     | <b>Speed fluctuations:</b> increase value by 5  |
| L36  | "P" Gain constant at high speed   | 2        | 10      | <b>Speed fluctuations</b> increase value by 0,25<br><b>Vibrations:</b> decrease value by 0,25 |
| L37  | "I" Time I constant at high speed | 0,100 s  | 0,100 s | <b>Speed fluctuations</b> decrease 0,01<br><b>Vibrations:</b> increase value by 0,01          |

### Notes:

Increasing the P constant makes response from machinery faster but may cause overshooting or hunting in motor. Furthermore, due to resonance of machinery or overamplified noise, machinery or motor may produce vibration noise.

On the contrary, decreasing the P constant excessively delays response and may cause speed fluctuation in a long cycle, taking time to stabilize the speed.

"I" times values (L37 and L39) normally do not need to be changed, unless "P" gains are not enough to achieve optimal comfort. Setting a small "I" Time constant shortens the integration interval, providing a faster response. On the contrary, setting a large "I" Time constant lengthens it, having less effect on the ASR. This may help in case of resonance of machinery generating abnormal mechanical noise from the motor or gears

## Stopping phase adjustments

Use the constants of the gains "P" and the times "I", at low speed, to make the final adjustment for the stop phase:

| PAR. | DESCRIPTION  | DEFAULT  |         | SUGGESTED ADJUSTMENTS   |
|------|--|----------|---------|---|
|      |  | Gearless | Geared  |   |
| E16  | Deceleration time # 9<br>(Last deceleration ramp)  | 1,80 s   | 1,80 s  | Increase value by 0,5 to soften last ramp<br>(max suggested value: 3 sec)   |
| H67  | Stop Hold Time   | 1,5 s    | 1,5 s   | <b>Car unable to stay at floor:</b> increase 0,25<br><b>Important:</b> In "Positioning" Menu :<br><b>Delay BRK-DIR</b> <= 2,0 s<br><b>Stopping Boost</b> = 1% or 2% |
| L38  | "P" Gain constant at low speed   | 2        | 10      | <b>Car unable to stay at floor:</b> increase 0,25<br><b>Vibrations:</b> decrease value by 0,25  |
| L39  | "I" Time I constant at low speed   | 0,100 s  | 0,100 s | <b>Car unable to stay at floor:</b> decrease value by 0,01<br><b>Vibrations:</b> increase value by 0,01   |
| L83  | Brake Control (OFF delay time)<br>(specifies the delay time between stop speed and deactivation of the brake signal) | 0,3 s    | 0,1 s   | <b>Larger Brakes:</b> decrease value by 0,1<br><b>Smaller brakes:</b> increase value by 0,1   |

**Notes:** In order to let the inverter perform the stopping phase correctly, make sure that operating contactors open at least 2 sec after brake contactor. If operating contactors open in advance, a shock on the machine may be heard.

## Case VVVF controllers with non-encoder based positioning systems

If a digital position system is used in the installation (i.e.: digital signal from magnetic detectors), some additional parameters must be used:

| PAR. | 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                                    | <b>Speed fluctuations:</b> increase value by <b>0,25</b>  |
| E13  | Acceleration at low speed         | 2                                    | <b>Motor stops:</b> increase value by <b>0,25</b>   |
| C07  | Creep Speed (5-10% of high speed) |                                      | <b>Motor stops:</b> increase value by <b>0,1</b><br><b>Vibrations:</b> increase/decrease value by <b>0,1</b>  |
| C11  | High Speed                        | See Nominal Value on the motor plate | <i>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</i> |

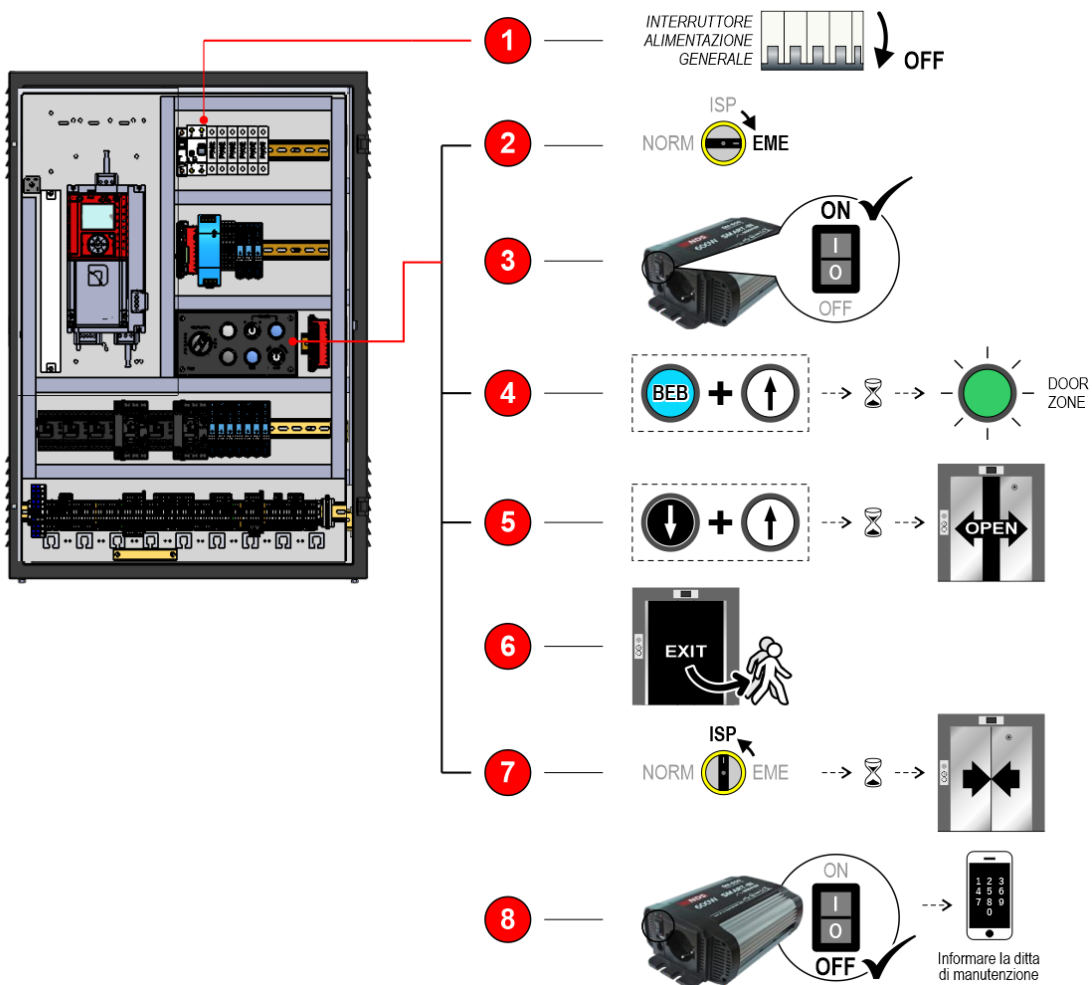
## ANNEX VI: Emergency/Rescue Manoeuvres

### Unbalancing Rescue Operation's



The operation must be performed by qualified personnel.

1. Open the Main Switch MDP
2. Turn Selector PME on EME position
3. Switch ON UPS module
4. Push BEB and Up buttons. NOTE: Door safety chain contacts are completely bypassed  
Brakes will be powered, the Cabin should move for unbalance (direction according the load in the cabin). In case of over speed ( $> 0,3$  m/s) the Cabin will stop and require you to release the buttons and press them again to restart.  
When the Cabin reaches the floor (Green light "DOOR ZONE") the controller automatically stops.  
Release buttons BEB and direction
5. Press UP and DOWN buttons to open the doors
6. Bring people out of the Cabin
7. Turn the PME Selector to INSPECTION position and wait until the controller close the doors
8. Switch off the UPS module



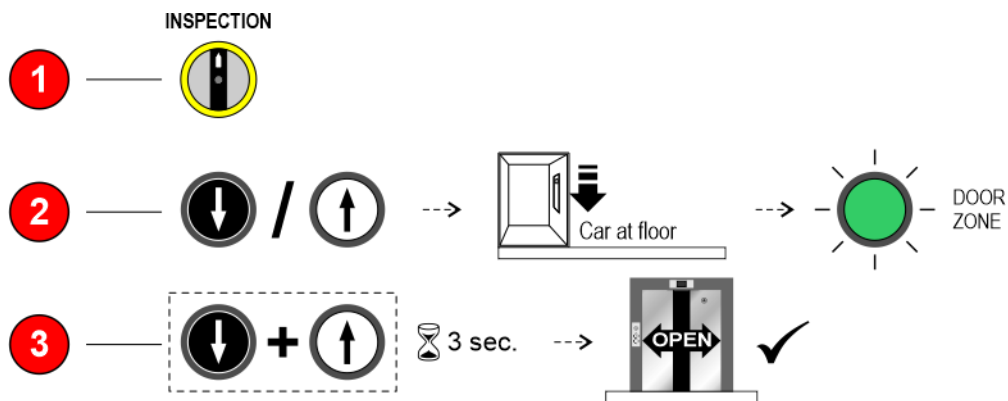


## Electrical emergency operation



The operation must be performed by qualified personnel.

1. Turn Selector PME on INSPECTION position;
2. Constantly press the "Up" or "Down" buttons. The car moves in the desired direction;
3. Press the "Up" or "Down" buttons simultaneously for 3 seconds to open the car doors.



To reset the system, position the PME selector on "NORMAL".

After activating the switch in "INSPECTION" mode, all car movements except those controlled by this manoeuvre, and all floor calls, including remote devices, are excluded.

If you are in Electrical Emergency Maneuver mode, and a car roof or pit bottom switch is activated in "INSPECTION" mode, the Maneuver is inhibited, and priority is given to the inspection push-button panels in the Shaft

## ANNEX VII: Control Panel

### Single Brake Test

The operation must be performed by qualified personnel.



1. Press BRAKE button
2. Turn BRAKE key on position 1 to open First Brake or on 2 to open second Brake.

Test can be made only:

- a) With cabin stationary and doors closed;
- b) During test 3 and test 4 (measurement of stopping distance at nominal speed)
- c) During deceleration and standard stop (to check Contactor locked fault)

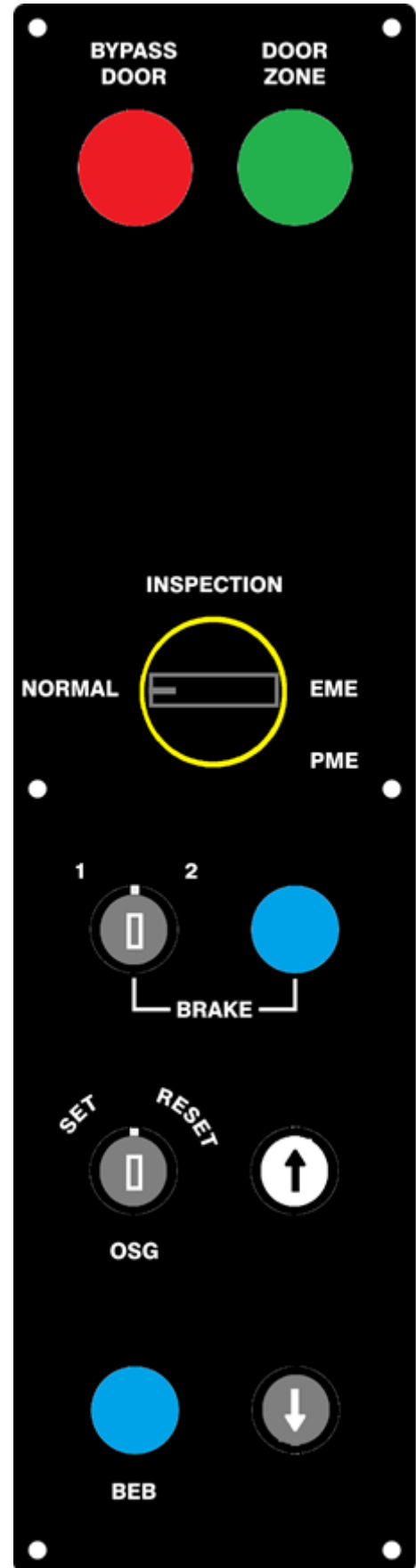
### Over Speed Governor Test

The operation must be performed by qualified personnel.



Operate on OSG Key:

- Activating of the OSG: turn to SET;
- Reset: Turn PME Selector to INSPECTION and turn OSG key to RESET.



## ANNEX VIII: UCM Circuit

The following table shows how to set the UCM Monitor parameter according to the device or circuit for detecting uncontrolled movements.

For Hydraulic installations the parameter is used for:

- ) Central unit / valves configuration (see table VIII.2)
- ) UCM solution managed by controller

| Monitor UCM |       | Device / Hydraulic Control Unit   | UCM Solution       | Actuator            |
|-------------|-------|---|--------------------|---------------------|
| Tipo        | Tempo |   |                    |                     |
| No          |       | Not present   | No                 | -                   |
| 1           | 1,5 s | Overspeed Governor OSG A3 Montanari RQ-AXXX   | Yes                | Safety Gear         |
| 2           | 1,5 s | Controller = Brake monitor  | Yes                | A3 Certified Brakes |
| 3 ⇔ 29      |       | Do not use  |                    |                     |
| 30          | 1,5   | Hydro Central Unit with Electromechanical valves<br>(A3 second down valve is optional, no test performed) | Without UCM / ELGO | -                   |
| 31 ⇔ 79     |       | Do not use  |                    |                     |

Table VIII.1 – Monitor UCM

## ANNEX IX: Installation Type

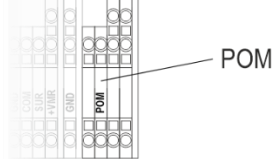
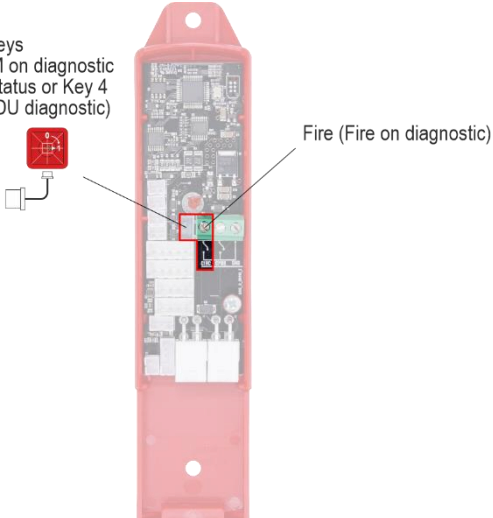
The following table indicates how to set the UCM parameter according to the type of system, including the solutions adopted for protection in systems with reduced headroom and / or pit spaces.

The use of monostable contacts involves the presence of a bistable circuit in the switchboard.

| UCM    |      | Installation type     | Reduced |      | Door contacts |          |
|--------|------|-----------------------|---------|------|---------------|----------|
| Type   | Time |                       | PIT     | HEAD | Monostable    | Bistable |
| No     |      | EN 81.1 / EN 81.2     |         |      |               |          |
| 1 ⇔ 58 |      | Reserved – Do not use |         |      |               |          |

Table IX.1 – UCM

## ANNEX XI: Fire operation programming procedure

| Wirings   |   |
|---|---|
| <p><b>Input POM</b><br/>Input located on the screw terminal</p>     |   |
| <p><b>Input Fire and input FF keys</b><br/>Input located on BDU</p> |  |

### Evacuation according to EN 81-73

a. **SITUATION 1: ONLY ONE EXTERNAL FIRE CONTACT FOR FIRE DETECTION (EVACUATION)**

Enter the menu "SPECIAL FUNCTIONS" submenu "FIREFIGHTERS" and set:

- The floor where the elevator must go in case of direct activation of the contact from the external fire contact
- The Access (if there are multiple doors)
- The stand-by state of the contact of the external fire contact (NO or NC).
- Program contacts NO type for the input FIREMAN
- The operation EN 81-72 (b)

Connect the contact to the POM input of the controller.

Using these settings and once the contact is activated by the external fire contact, the elevator will go to the programmed floor, open the doors and remain stopped (PHASE 1). The Landing Operation Panels and the Car operating Panel are disabled. The reactivation of the elevator will take place at the deactivation of the contact from the external fire contact.

b. **SITUATION 2:** EXTERNAL FIRE CONTACT AND LIFT WITH ALTERNATIVE EVACUATION FLOORS

Enter the menu "SPECIAL FUNCTIONS" submenu "FIREFIGHTERS" and set:

The first evacuation floor

- The Access (if there are multiple doors)
- The stand-by state of the key switches (keys are optional) (use NO)
- The operation EN 81-73
- Additional evacuation floors (up to three different) in priority order
- Connect the wiring as indicated in the electric diagram: the contacts of sensor must be connected to the BDU's input FIRE-GND. (In case of LOP's parallel wiring must be used an 16IO expansion board in the controller). In case of floors not managed by the control unit, the corresponding inputs must be shunted (if the fire sensors are programmed with NC contact) .

The activation of one of signals:

- POM Key (optional contact)
- FIRE (of any of the BDUs)

will start PHASE1 of the operation (also called evacuation) and will not allow car calls without the activation of the fire-fighters key-switch in the car. The evacuation floor could be different according the rule:

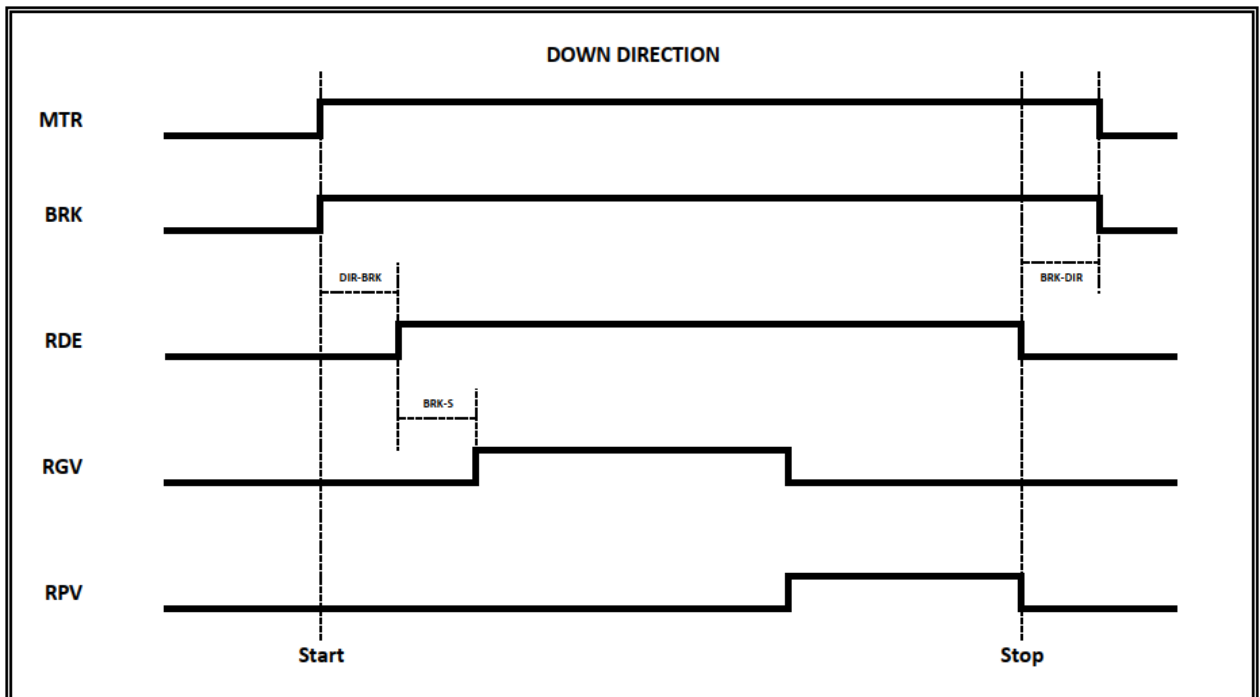
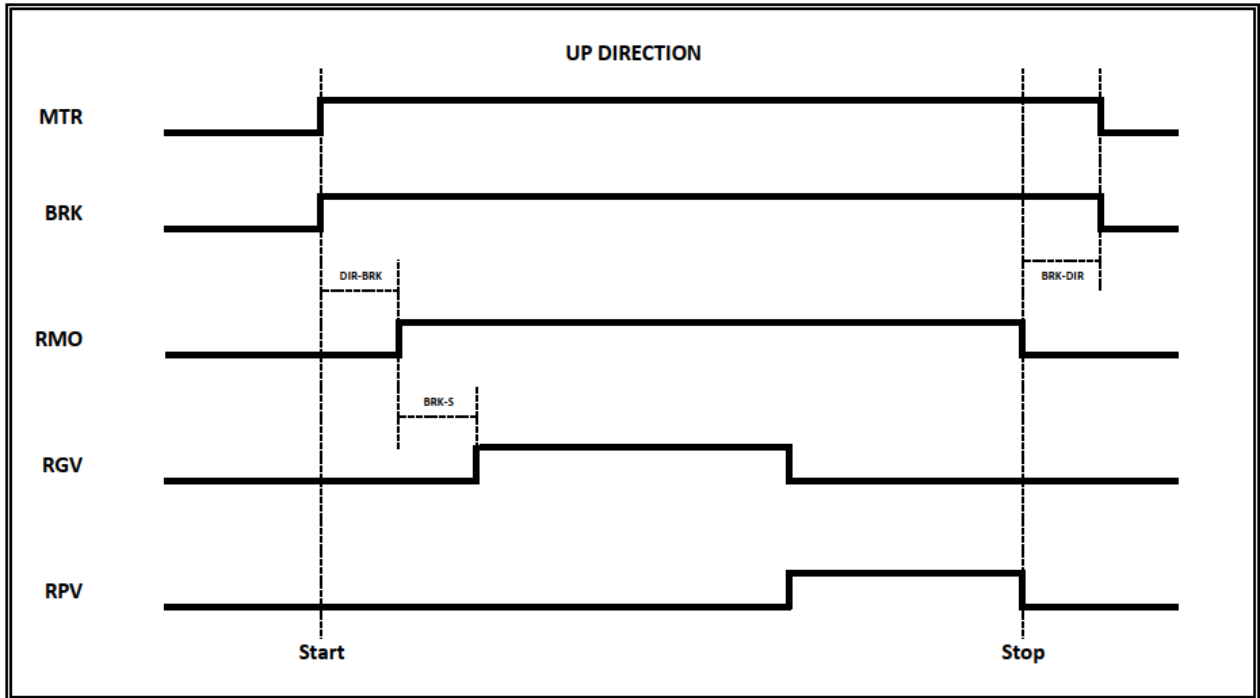
- If FIRE of main floor is not active => evacuation to main floor
- Else, If FIRE of main floor is active => evacuation to alternative floor (the first with FIRE not active)

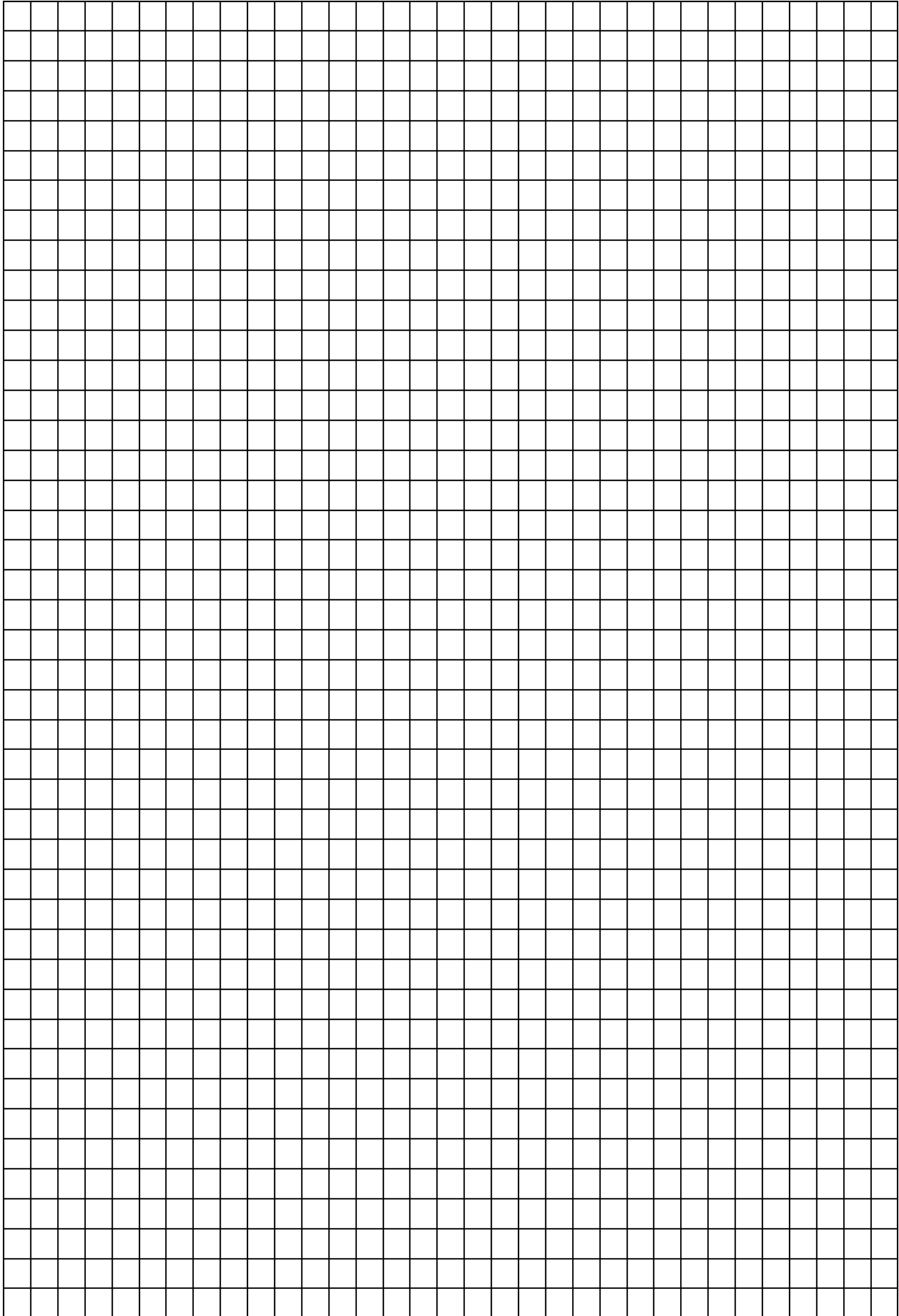
In case of multiple FIRE inputs active on all of alternative floors, it will be used the main evacuation floor. During the evacuation to a floor (when car is moving), if the corresponding input has the FIRE active, destination floor will be changed according the same rules.

Lift stops at evacuation floors, with door open (could be possible to set closed parking). Lift comes back in normal mode when the external signals (FIRE and optional POM/FIREMAN) comes back in the inactive status.

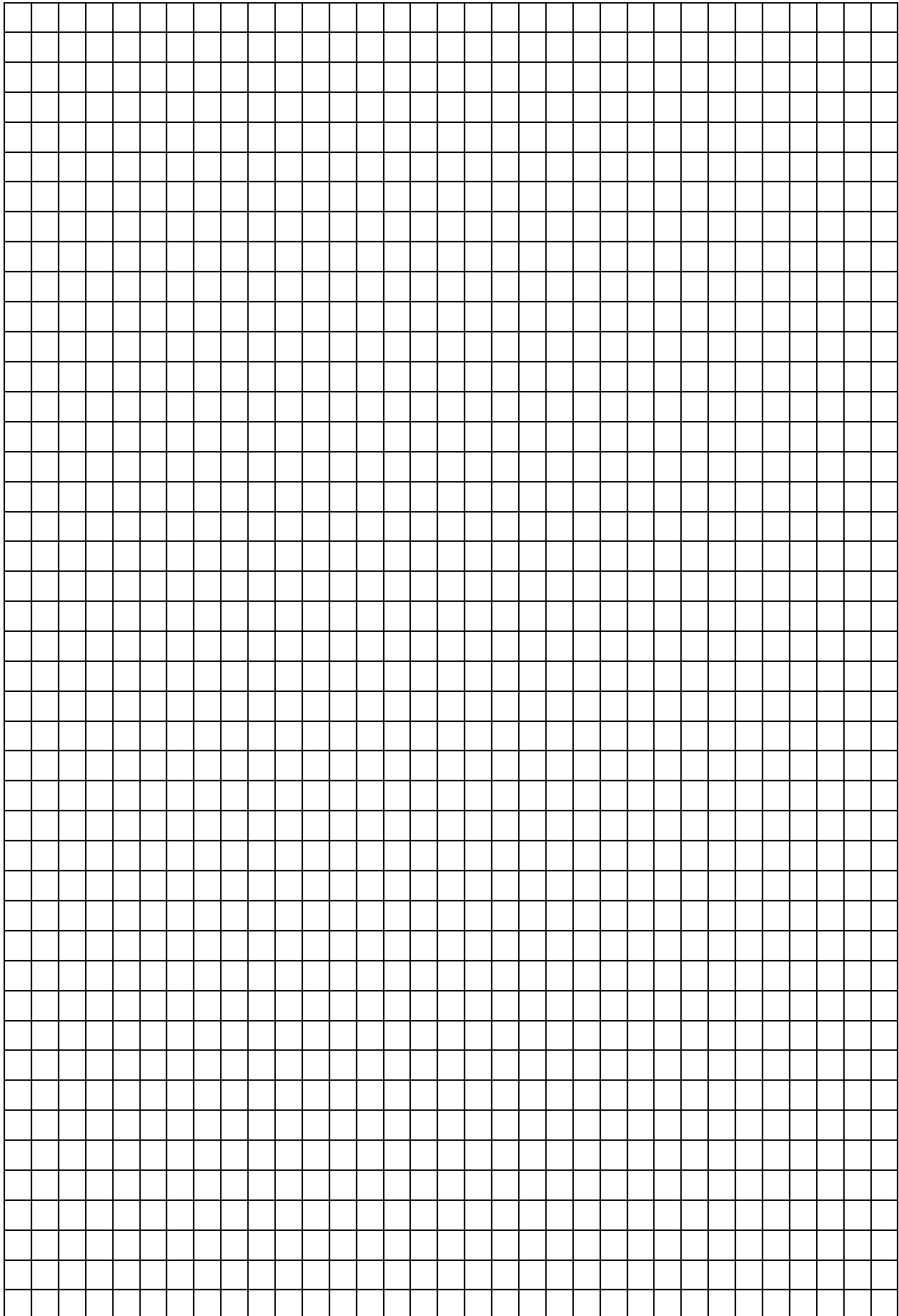
## Annex XII: Timing Diagrams

### Installation with Inverter FUJI LM2









# PITAGORA 4.0



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