# AE-SMART

## Monoblock Lift Controller

# USER MANUAL

aybey elektronik
lift electronics...

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# PREFACE

**AE-SMART** is a mono-block lift controller. It is manufactured as a complete lift controller box rather than assembling motor driver, controller board, etc.

In this manual, you will find detailed information about **AE-SMART**. However, since there are continuous developments in software it is possible that the software version you are using may not be fully compatible with this manual. If this is the case, you can download the most recent manual from www.aybey.com.

You can send an e-mail to support@aybey.com either to get more technical information about the system or to send any comments. Please feel free to contact us for any problems or suggestions. Bear in mind that all these systems have been developed mainly by benefiting from the criticism of customers and users.

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## ! CAUTIONS IN INSTALLING THE DEVICE!

- Read user manual carefully before installation.
- Switch off power (line, UPS or battery) and wait at least 5 min. before you remove the device cover. Connect earth (PE) terminal before you switch on power.
- Do not connect or disconnect a terminal while the device is powered on.
- Make sure that you have left enough free air space around the system box. There must be at least **15 cm free space** above and below the box.
  This free space is very important for air circulation to cool the device.
- Do not close **ventilation holes** on top of the box.
- Do not allow any water or liquid to drop onto the box. This may lead to burn electronic parts inside the device.
- Do not use the device in places where **excessive humidity, dust, explosive materials**, or extraordinary **chemical substances** are present.
- Do not use the device under environmental conditions below -10 °C or above 40 °C.
- Do not install the device where the device is exposed to direct sunlight.
- Rescue instructions are inside the cover of the device. Reed and follow them when you need to rescue somebody in lift.
- Bypass instructions are inside the cover of the device. Reed and follow them when you need to bypass the doors.
- Never run the motor without connecting the appropriate braking resistor. Otherwise, the motor driver will be damaged by excessive regenerative voltage.
- There are some parameters or parameter values to bypass or inhibit some safety or UCM functions. These can be used only and only for repairing or test purposes. Never leave any parameter bypassing a safety or UCM function in service. This subject is totally in responsibility of the installation and maintenance persons and firm.
- Never run the device in simulation mode in the installation. Simulation mode is purposed to be used only to test or show the system outside of lift, namely in workshop, showroom or development site.

# CHAPTER 1 –DESCRIPTION AND SPECIFICATIONS OF THE SYSTEM

## 1.1 GENERAL SPECIFICATIONS

| Specification | Supported Values | Remarks |
|---|---|---|
| **Lift Type** | Electric Lift | |
| **Motor Type** | Geared traction machine (asynchronous motor) | Open loop (without encoder) |
| | | Closed loop (without encoder) |
| | Gearless (synchronous motor) | With absolute encoder (EnDat, SinCos, biss, SSI) |
| **Motor Driving System** | STO – Contactor-less | |
| **Line Voltage** | 3x400V | 704xx series - 4…15 kW |
| | 3x190V | 702xx Series - 4… 7,5 kW |
| **Safety Voltage** | 42V AC | |
| **Number of Stops** | 12 | |
| **Number of Doors** | 1 | |
| **Lift Standard** | EN81-20/50 EN81-1+A3 EN81-1+A2 | |
| **Fire Standard** | EN81-73 | |
| **Other Lift Standards** | EN81-28 EN81-70 | |
| **Electric Distribution Panel** | Optional for gearless machines | |
| **Controller - Car Circuit Communication** | Serial | Low Speed, Fault Tolerant CAN-Bus |
| **Car Operating Panel** | Serial | With RBC board as car controller |
| | Parallel | With SCB board as car controller |
| **Controller – Landing Panels Communication** | Serial | Base configuration |
| | Parallel | Using optional RBIO board. |
| **Inputs in Shaft Pit** | Parallel | Base Configuration |
| | Serial | With optional CIO board (via CAN1) |
| **Lift Standard** | EN81-20/50 EN81-1+A3 EN81-1+A2 | |
| **Car Position Information** | Motor Encoder | Supported in closed loop operation |
| | Shaft Encoder | Optional ENC board is required |
| | Mono Magnet Switch | Counter with magnet switches |
| | Bi-Stable Magnet Switch | Counter with magnet switches |
| **CAN Ports** | CAN0 | Low Speed CAN<br>Used for car circuit |
| | CAN1 | High Speed CAN<br>Used for landing panels |
| | CAN2 | Low Speed CAN<br>Used for duplex communication |
| **Rescue System** | Internal | with batteries |
| | External | With batteries or with UPS |

## 1.2 PRODUCT CODES AND MODELS

The table below shows the product code expansion of AE-SMART.

| Lift Standard | Line Voltage | Rescue System | Power | Motor Type |
|---|---|---|---|---|
| 0 | 4 | B | 05 | R |
| 1 | 2 | J | 07 | D |
| | | | 11 | E |
| 0 : EN81-20/50 | 4: 3x400V | J: Internal | 03: 3 kW | R: asyncronous (Geared) |
| 1 : EN81-1 | 2: 3x190V or 1x230V | B: External not supplied | 05: 5,5 kW | D: Syncronous (Gearless) |
| | | | 07: 7,5 kW | E: Syncronous (Gearless) with electric distribution panel |
| | | | 11: 11 kW | |
| | | | 15: 15 kW | |

## 1.3 ELECTRICAL SPECIFICATIONS AND RATINGS (3x400V Series)

Technical specifications and maximum ratings are shown in Table 1.1.

**Device will be damaged if maximum ratings are exceeded or if improper braking resistors are used. Therefore, select braking resistors according to the tables shown below**.

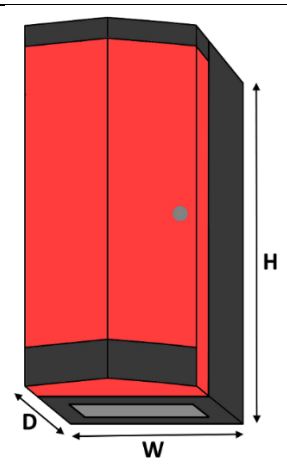
Table 1.1 Electrical Specifications of **400V** Series

| **MODEL (400V Series)** | **SM403** | **SM405** | **SM407** | **SM411** | **SM415** |
|---|---|---|---|---|---|
| **Nominal Motor Power** | 3 kW (4,3 HP) | 5.5 kW (7.5 HP) | 7.5 kW (10 HP) | 11 kW (15 HP) | 15 kW (20 HP) |
| **Nominal Output Current** | 7 A | 13 A | 18 A | 25 A | 32 A |
| **Maximum Current**<br>**Allowed Time** | 14 A<br>5 s | 26 A<br>5 s | 36 A<br>5 s | 50 A<br>5 s | 64 A<br>5 s |
| **Control Circuit Supply Voltage** | 1-Phase 100V.....240V AC 50/60 Hz +- %5 | | | | |
| **Line Voltage** | 3-Phase 340V.....420V AC 50/60 Hz +- %5 | | | | |
| **Motor Output Voltage** | 3-Phase 0V.....420V AC 0.....100 Hz | | | | |
| **Carrier Frequency** | 6....16 kHz | | | | |

Table 1.2 Electrical Specifications of Braking Resistors (for **400V** Series)

| **Braking Resistors for 400V Series** | **SM403** | **SM405** | **SM407** | **SM411** | **SM415** |
|---|---|---|---|---|---|
| **Braking Resistor Values** | **120 Ω** | **80 Ω** | **60 Ω** | **40 Ω** | **30 Ω** |
| **Minimum Resistor Power of Asynchronous Motor (Car speed <= 1.2 m/s)** | 1.000 W | 1.200 W | 1.500 W | 2.200 W | 3.000 W |
| **Minimum Resistor Power of Asynchronous Motor (Car speed > 1.2 m/s)** | 1.500 W | 1.800 W | 2.250 W | 3.300 W | 4.500 W |
| **Minimum Resistor Power of Synchronous Motor (Car speed < 1.2 m/s)** | 1.500 W | 1.800 W | 2.250 W | 3.300 W | 4.500 W |
| **Minimum Resistor Power of Synchronous Motor (Car speed > 1.2 m/s)** | 2.000 W | 2.400 W | 3.000 W | 4.400 W | 6.000 W |

## 1.4 MECHANICAL SPECIFICATIONS

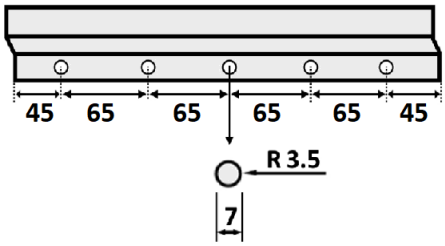



**Dimensions of the Box**

| Models R and D | | |
|---|---|---|
| **Without Electric Distribution Panel** | | |
| **H** | **W** | **D** |
| 805 | 405 | 275 |

| Model E | | |
|---|---|---|
| **With Electric Distribution Panel** | | |
| **H** | **W** | **D** |
| 1060 | 405 | 275 |

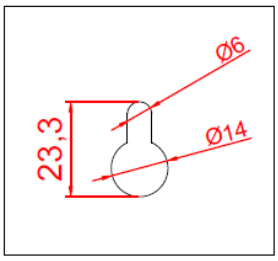
**Wall Hanger**

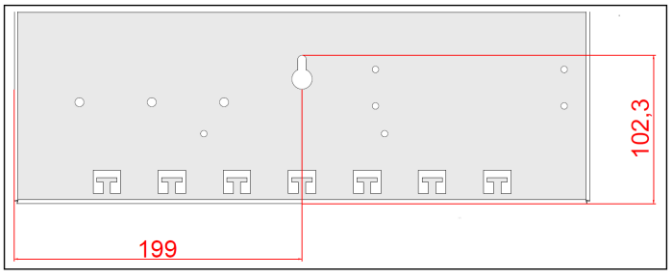



The metal box should be hanged onto the wall with wall hanger.

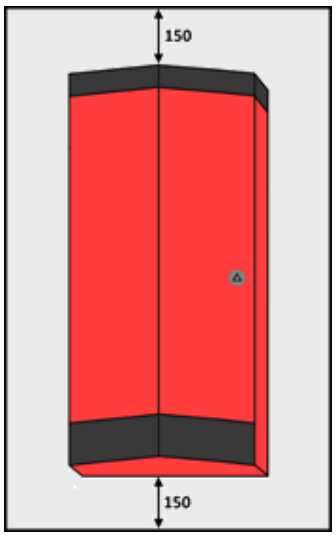
Therefore, it must be fixed on the wall firstly.

The distance from the center of the screws in the wall hanger to the top level of the box should be 57mm.




After hanging the box on the Wall hanger, you should fix the inner plate onto the Wall with a screw.




**FREE SPACE ABOVE AND BELOW THE BOX**

There must be at least 150 mm free space above and below the box.

This is required for air circulation to cool the electronic parts inside.

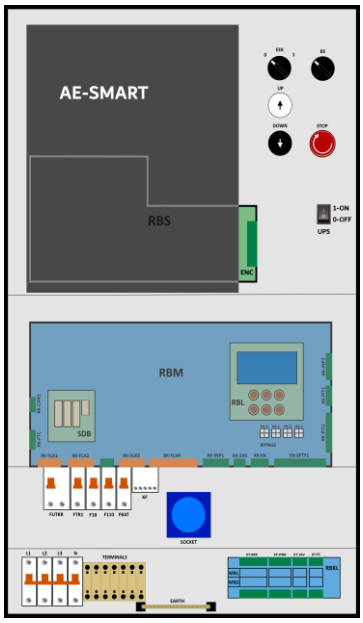
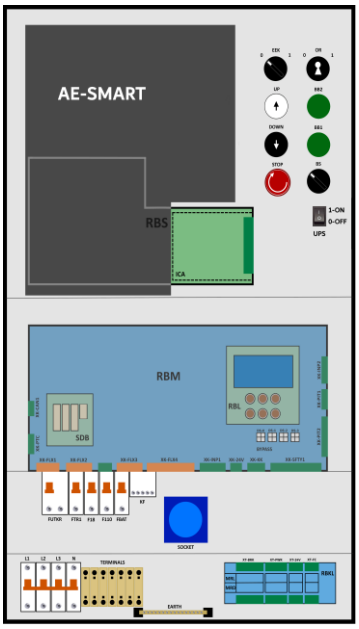
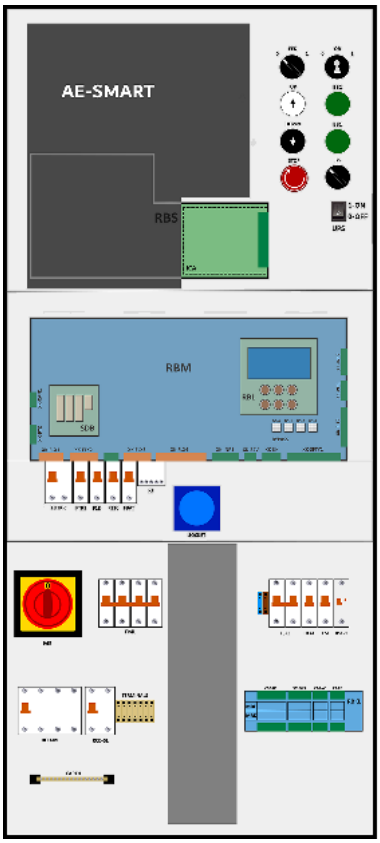
Do not close ventilation holes on top of the box.

Be sure that there is no possibility to drop water or any liquid onto the device.

# CHAPTER-2 ELECTRIC SYSTEM

## 2.1 INTERIOR STRUCTURE

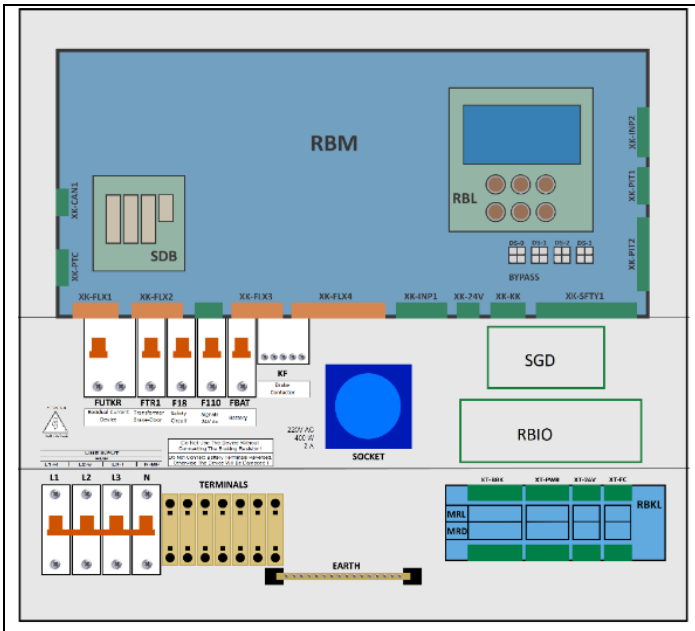
AE-SMART is produced in three main models.

| Model R | Model D | Model E |
|---|---|---|
| for geared machines | for gearless machines | for gearless machines with electric distribution panel |
|  |  |  |



The lower section (mid section in model - E) is same in all models and contains common circuits and components. The upper section varies depending on the motor type, syncronous or asyncronous. In model E there is an additional section for electric distribution panel.

### 2.1.1 Main Board and Circuit Breakers

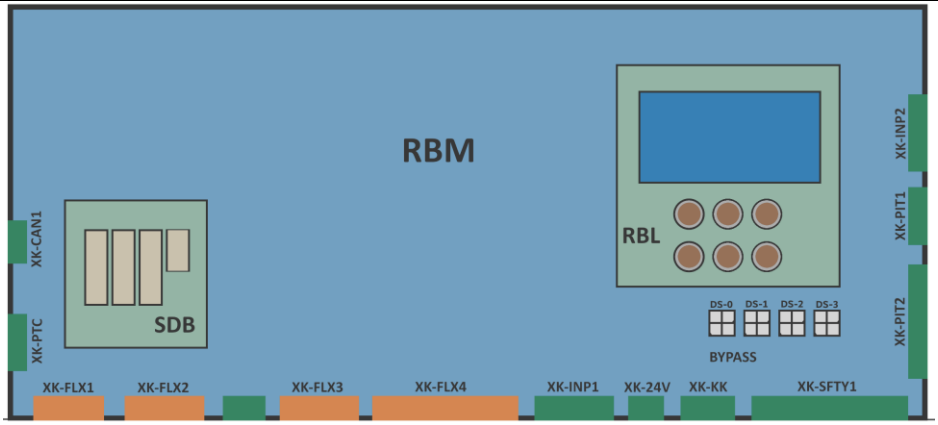



The mid-section of the box is common in all models as far as main functions are concerned.

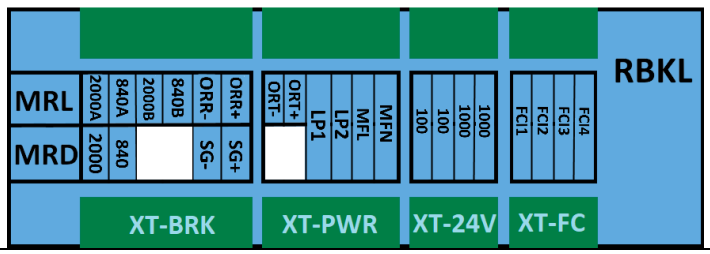
Main power circuit breakers, brake contactor, main controller board RBM, terminals, earth bar and terminal board RBKL are placed in this section.

When needed **SGD** and **RBIO** boards will be mounted onto the designated places.

**RBKL** serves as the terminal board of the device.

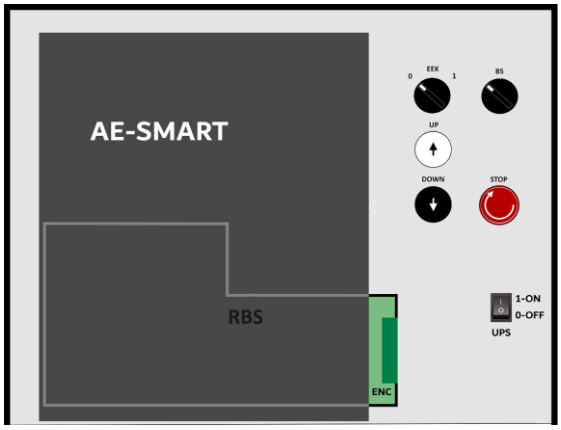
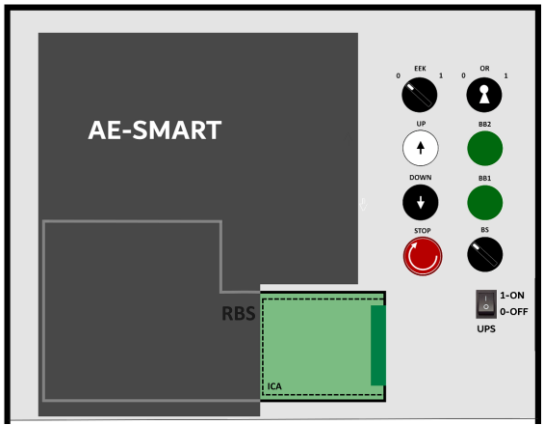
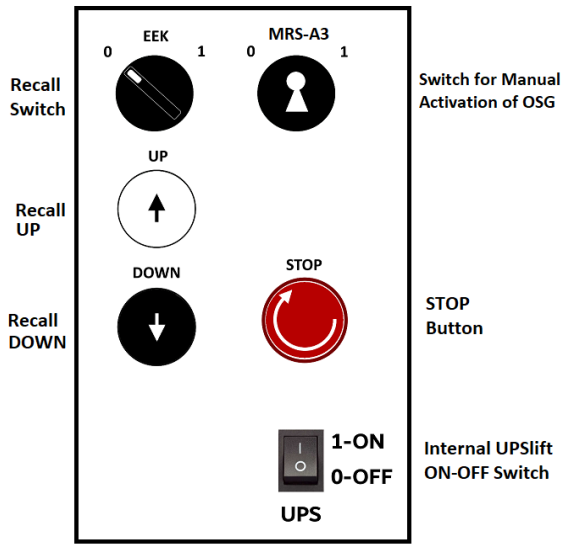
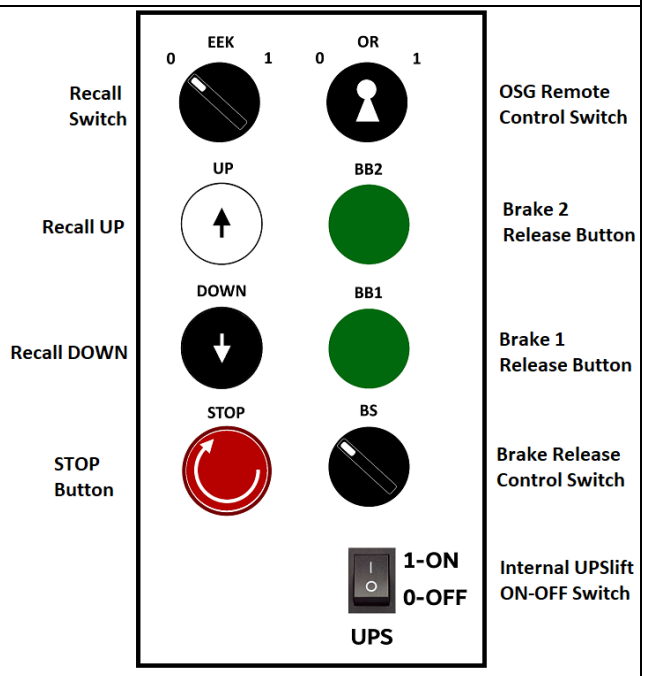



**RBM** is the main board of the device. RBL, keypad and screen, bypass sockets and SDB door bridging board are placed on it.
The terminal blocks shown in orange colour are for car circuit and must be connected to the flex cable.
The terminal blocks shown in green colour are for shaft and machine room connections.




**RBKL** is the terminal board of the device.
Use upper line labels for gearless machines (Model D, E).
Use lower line labels for geared machines (Model R).

### 2.1.2 Upper Section

| Model R<br>for geared machines | Model D and E<br>for gearless machines |
|---|---|
|  |  |
| The upper section in geared model contains recall buttons and OSG activation switch.<br><br>Interface for incremental encoder is located here.<br><br>UPS switch is present only in models produced with integrated rescue unit.<br><br>The functions of the button and switches of command panel is shown below. | The upper section in gearless model contains recall buttons and manual brake opening buttons.<br><br>ICA board serves as interface for absolute encoder of synchronous motors.<br><br>UPS switch is present only in models produced with integrated rescue unit.<br><br>The functions of the button and switches of command panel is shown below. |
|  |  |

## 2.2 ELECTRONIC BOARDS IN THE SYSTEM

The electronic boards used in AE-SMART are listed below.

| | |
|---|---|
| **RBM** | It is the main controller board. |
| **RBS** | RBS manages and controls motor motion. |
| **RBL** | LCD Display and Keypad Unit |
| **ICD** | Motor Driver Power Board |
| **RBC** | RBC is used in inspection box when the connections are prewired or serial COP is used. It contains 3 programmable relay outputs and 16 programmable inputs, a battery charger for emergency power supply, and hardware for other lift functions in car. It also supports announce system when ANS (Announce Board) board is plugged. |
| **RBKL** | Controller Terminal Board |
| **SDB** | This is the door bridging board plugged onto the device. |
| **ICA** | Integrated lift controller requires an add-on encoder board to drive synchronous motors called ICA. It supports EnDat, SSI, BISS and SinCos encoder types. |
| **RBIO** | If the landing panels are parallel, then RBIO must be used. It drives call buttons and signals in LOPs. |
| **RBPB** | This board serves as a controller in shaft pit. It is optionally communicating via CAN-BUS with CIO board. |
| **CSI** | CSI is the CAN interface board used for duplex operation for both controllers. |
| **ICG** | Group communication board required for duplex operation. |
| **USN** | USB interface board for local PC connection. |
| **ETN** | It is the Ethernet interface board and is used to connect a PC to the controller either with a local area network (LAN) or via the internet. |
| **ANS** | This board is a pluggable module and contains speaker circuit an also memory for announcement data. It is used together with RBC board. |
| **SGD** | SGD controls the activation of the coil on speed governor. |
| **BDB** | Bridge Rectifier Board for Brake and Retiring Cam |
| **BDC** | Bridge rectifier board for 24V DC |

## 2.3 DEFINITION OF CODES

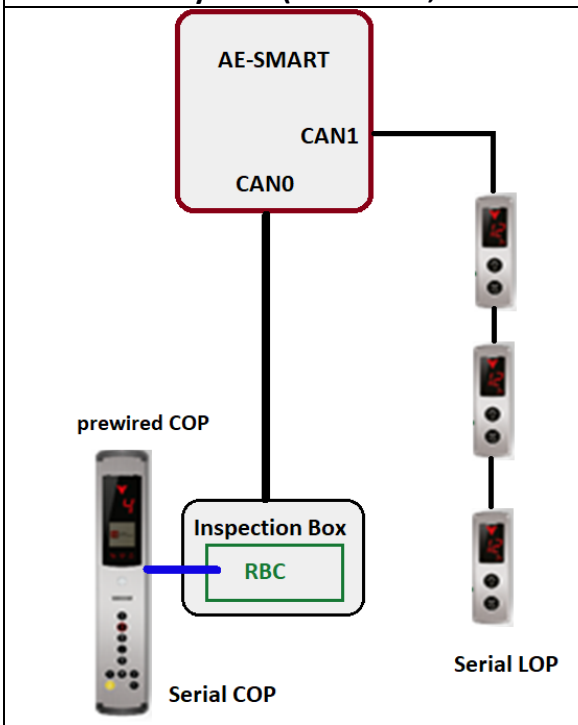
The main codes are listed below. The explanation of the ones not listed here can be found in electric wiring diagrams.

| Code | Part Name | Models |
|---|---|---|
| FMP | Circuit Breaker for Line phases | R-D |
| FUTKR | Residual Current Device 30 mA | R-D |
| FTR1 | Circuit Breaker of Transformer Circuit | all |
| F18 | Circuit Breaker of 24V dc Signal Circuit | all |
| F110 | Circuit Breaker of Safety Line | all |
| FBAT | Circuit Breaker of Battery | all |
| KF | Brake Contactor | all |
| EEK | Recall Switch | all |
| UP | Recall Up Button | all |
| DOWN | Recall Down Button | all |
| MRS-A3 | Switch for manual Activation of Overspeed Governor | R |
| BS | Brake Release Switch in Gearless Machine | D-E |
| BB1 | Gearless Machine Brake 1 Release Button | D-E |
| BB2 | Gearless Machine Brake 2 Release Button | D-E |
| OR | Overspeed Governor Remote Control Switch | D-E |
| STOP | Emergency Stop Switch | all |
| UPS 1-ON | UPS Switch ON State | all |
| UPS 0-OFF | UPS Switch OFF State | all |
| RCD-M | Residual Current Device 300 mA (Main Power) | E |
| RCD-SL | Residual Current Device 25A (230V Car and Shaft) | E |
| FSKL | Circuit Breaker of Car and Pit Light | E |
| FKAL | Circuit Breaker of Car Light | E |
| MS | Main Switch | E |
| FML | Circuit Breaker for line phases | E |
| KSL-1 | Impulse Relay for Shaft Lamps | E |
| U , V, W | Driver Output for Motor Windings | all |
| P+ and BR | Braking Resistor Connection Terminals | all |
| BAT+ | Positive End of battery | all |
| BAT- | Negative End of battery | all |
| 2000 - 840 | Output for brake coils | all |
| SG+ SG- | UCM Clamping Coil Output on OSG | R |
| ORR- ORR+ | OSG Reset Coil | D, E |
| ORT- ORT+ | OSG Test Coil | D, E |
| PE | Earth Terminal | all |
| 100 | Positive End of Signal Voltage 24V DC | all |
| 1000 | Negative End 0f Signal Voltage 24V DC | all |

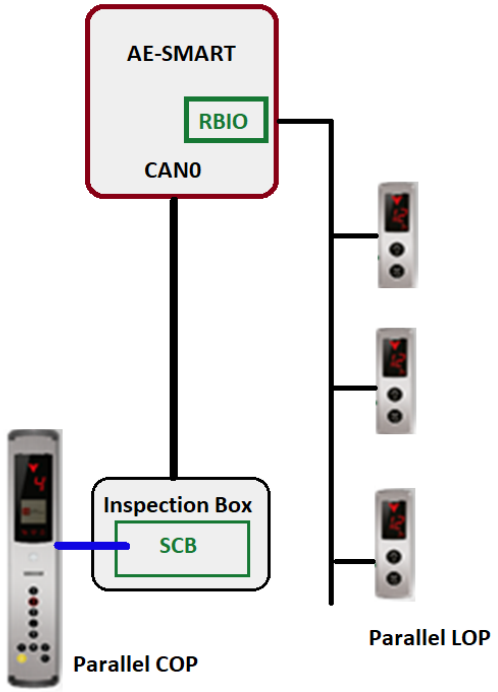
## 2.4 SHAFT COMMUNICATION

**AE-SMART** box is delivered always as **full serial**. Namely, car and landing circuits are serial. Car circuit uses CAN0 and landing circuit CAN1. If parallel landing panels are used, then a **RBIO** board is required in controller box. RBIO serves as parallel interface for LOPs.

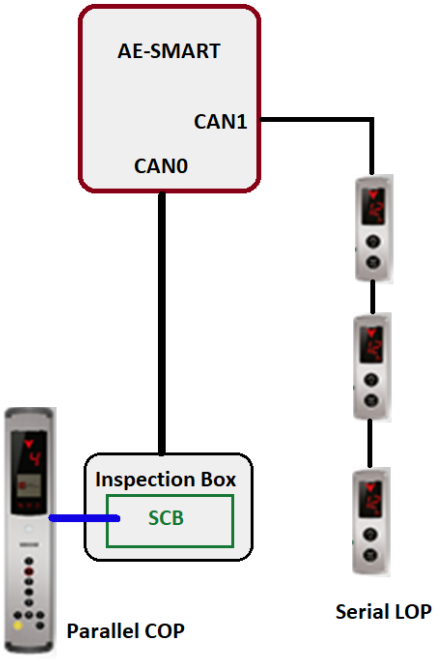
**Full serial System (Serial COP, Serial LOP)**



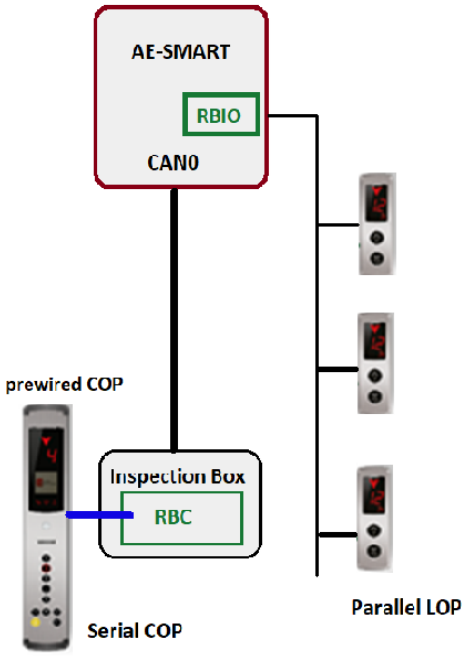

**Parallel COP, Parallel LOP**




**Parallel COP, Serial LOP**



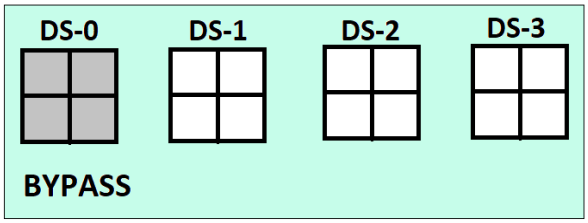

**Serial COP, Parallel LOP**




RBC has been designed for full serial prewired system. It has interface for direct connection to serial car operating panel. The output terminals of RBKL have the same order as in RBC to standardize prewiring system.

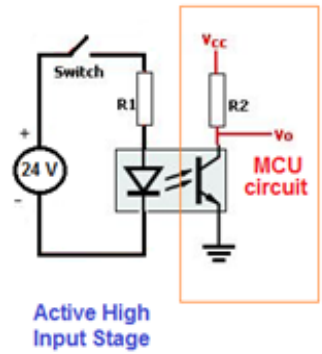
## 2.5 BYPASS SYSTEM

Bypass system used for door bridging in inspection mode is on RBM board.
There is only one plug and four places for it.
**In normal mode the plug must be placed in DS-0 socket**.
If all sockets are free or plug is in any other socket, then you will get an error message and no motion is allowed.
In inspection mode you can put the plug into other sockets to bridge landing or door contacts.
The contacts shorted in each place is shown in the figure below.
In this way inspection travel with bypassed door contacts are allowed, provided that KL-1, car door closed contact is closed.
You can find more information about bypass circuit in page **5-BYPASS SOCKETS** of electrical wiring diagram.

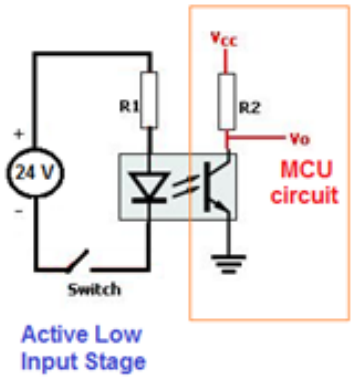



| DS-0 | DS-1 | DS-2 | DS-3 |
|---|---|---|---|
| NORMAL<br>no bridge | 120 !<br>125 | 125 !<br>130 | 130 !<br>140 |

## 2.6 INPUT HARDWARE AND LOCUS OF INPUTS

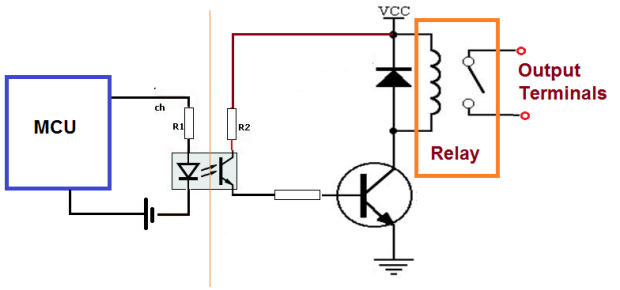



All inputs except **ML1-ML2** and **safety circuit** are active low.
It means that an active state from a detector is monitored when this input is connected to the ground reference (0V) of DC power supply.
All inputs are 100% galvanically isolated from the microcontroller circuit since they are connected via optocouplers to this circuit.




| INPUT NO | PLACE / SOCKET | BOARD NAME | TERMINAL NAME |
|---|---|---|---|
| I1…I16 | PANEL / TERMINAL | RBM | I1…I16 |
| N1…N16 | CAR / TERMINAL | RBC | N1…N16 |
| N17 | CAR / TERMINAL | PWS | N17 |
| N18…N21 | CAR / TERMINAL | PWS (INPS) | I1…I4 |
| Y1…Y4 | PIT / TERMINAL | RBPB (CIO) | Y1…Y4 |

## 2.7 OUTPUT HARDWARE AND LOCUS OF OUTPUTS

| | |
|---|---|
| All contactor and programmable outputs are 100% galvanically isolated from the microcontroller circuit by means of optocouplers. |  |

| NO | CODE | LOCATION | CONTACT V/I | CONTACT TYPE |
|---|---|---|---|---|
| 1 | S1 | RBM | 220V AC/10A | NO |
| 2 | S2 | RBM | 220V AC/10A | NO |
| 3 | V1 | RBPB (CIO) | 220V AC/5A | NO |
| 4 | V2 | RBPB (CIO) | 220V AC/5A | NO |
| 5 | R1 | RBC | 220V AC/5A | NO |
| 6 | R2 | RBC | 220V AC/5A | NO |
| 7 | R3 | RBC | 220V AC/5A | NO |
| 8 | R4 | RBC (OUT) | 220V AC/5A | NO |
| 9 | R5 | RBC (OUT) | 220V AC/5A | NO |
| 10 | R6 | RBC (OUT) | 220V AC/5A | NO |
| 11 | R7 | RBC (OUT) | 220V AC/5A | NO |
| 12 | R8 | PWS | 220V AC/5A | NO |

# CHAPTER 3 – SCREEN AND KEYBOARD

### 3.1 LCD SCREEN AND KEYPAD

RBL board in AE-SMART has an LCD screen with 4 lines and 20 characters per line and a keypad with 6 buttons. Buttons are located as below:

| | | |
|---|---|---|
| ← | ↑ | → |
| **ESC** | ↓ | **ENT** |

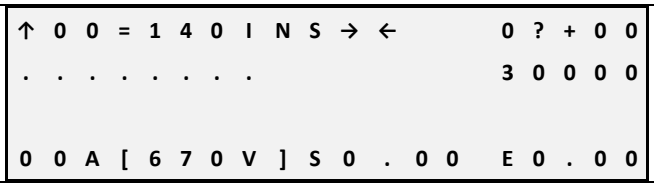
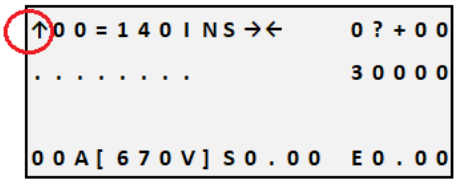
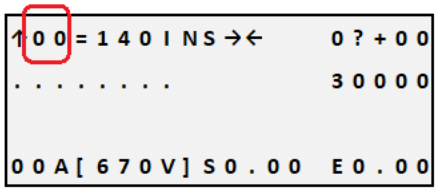
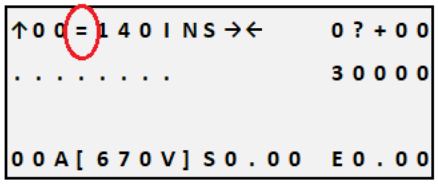
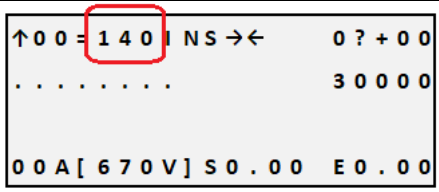
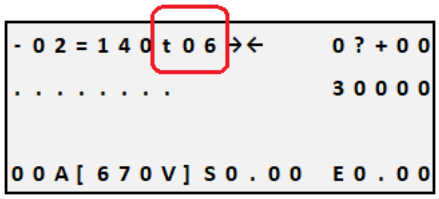
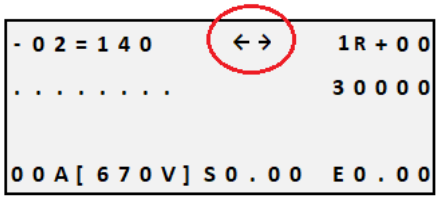
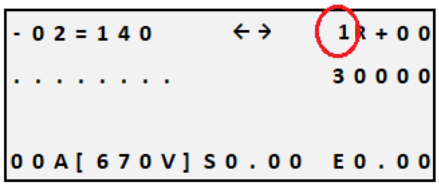
The arrow buttons have various functions depending on the screen or menu they are used. However, **ESC** and **ENT** buttons usually have the same functions, such that pressing **ESC** button exits from current menu or application and **ENT** button usually confirms anything asked or selects the indicated line. **UP** (↑), **DOWN** (↓), **LEFT** (←), and **RIGHT** (→) arrow buttons are used to move the cursor in screen or increment or decrement any number. Please be aware that there are some screens where a special button is asked to be pressed to continue or to do a specific task.

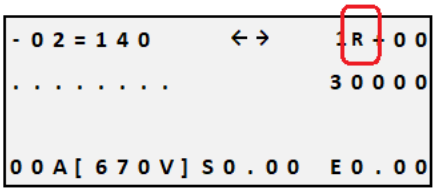
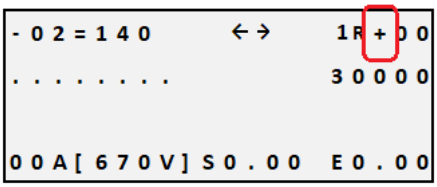
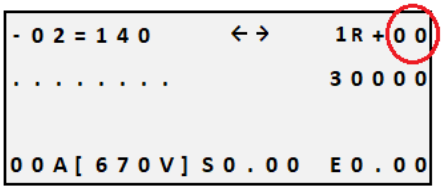
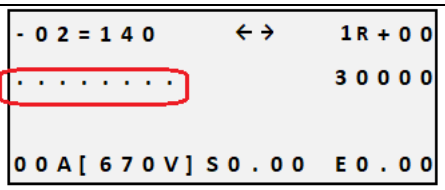
| **Common Use of keys** | | |
|---|---|---|
| You can use ↑ and ↓ keys to increment or decrement the value of an asked input, respectively. | **T01: 0 7 . 3 sec.**<br>**BUSY PERIOD** | Pressing ↑ button increments the digit highlighted by the cursor. |
| **T01: 0 7 . 4 sec.**<br>**BUSY PERIOD** | You can move between digits by using ←→ buttons. Pressing ← moves the cursor to the left digit if present. | **T01: 0 7 . 4 sec.**<br>**BUSY PERIOD** |
| Pressing ↓button decrements the digit highlighted by the cursor. | **T01: 0 6 . 4 sec.**<br>**BUSY PERIOD** | Pressing **ENT** button saves the value entered. Pressing **ESC** button disregards the entered value and exits without saving. |

### 3.2 START-UP SCREENS

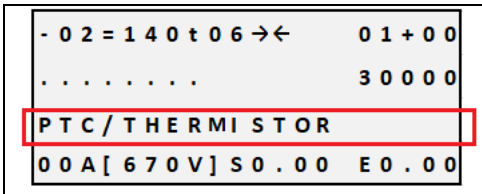
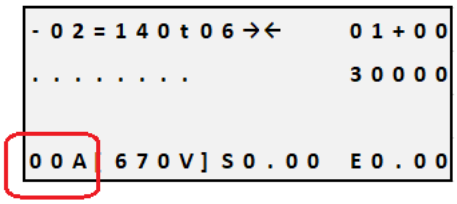
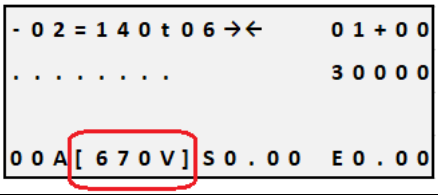
| In startup the following screens are displayed to give information about the device. | |
|---|---|
| **AE-SMART ver. 2.40a**<br>**System starting…**<br>**. . . . . .** | Just after the device has been switched on this screen appears. The software version of the controller is displayed after as ver. xxx. |
| **AE-**<br>**SMART ver. 2.40a**<br>**System starting…**<br>**parameters loaded.** | When the controller reads parameters, then start-up process is completed. |

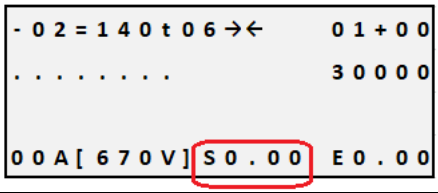
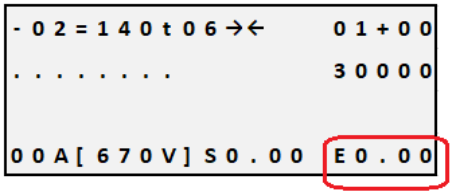
## 3.3 MAIN SCREEN

<table>
<tr><td colspan="2"> 
</td></tr>
<tr><td colspan="2">After start-up main screen is displayed. Main screen displays important state variables by using some letters and symbols. Understanding this screen will help you in operation significantly.</td></tr>
<tr><td>  </td><td>The first character indicates the direction of the motion with an UP or DOWN arrow.<br>If there is no direction, then ‘–‘ character is displayed.</td></tr>
<tr><td>  </td><td>The 2nd and 3rd characters indicate together the car position (floor number).</td></tr>
<tr><td>  </td><td>The 4th position shows the door zone.<br>An equal sign ‘=’ is indicates that the car is at floor level, namely at door zone.<br>When the car is outside of door zone, then ‘.’ will be displayed.</td></tr>
<tr><td>  </td><td>The 5 … 7 th characters shows the status of safety circuit. Always the closed node with the highest number will be displayed. 140 means that the safety line is closed.</td></tr>
<tr><td>  </td><td>The positions 8, 9 and 10 are a group.<br>In normal mode the target floor is displayed.<br>In inspection mode “INS” string will be displayed.<br>When the lift is blocked then “BLO” string will be displayed.<br>In rescue mode “ERS” string will be displayed.</td></tr>
<tr><td>  </td><td>The positions 11 and 12 show the status of the doors.<br>→← indicates doors close command.<br>←→ indicates doors open command.<br>–– indicates that doors are without any command.</td></tr>
<tr><td>  </td><td>The position 16 shows the result of the door test.<br>‘0’ indicates that no door test has been completed.<br>‘1’ indicates that a successful door test has been carried out.</td></tr>
</table>

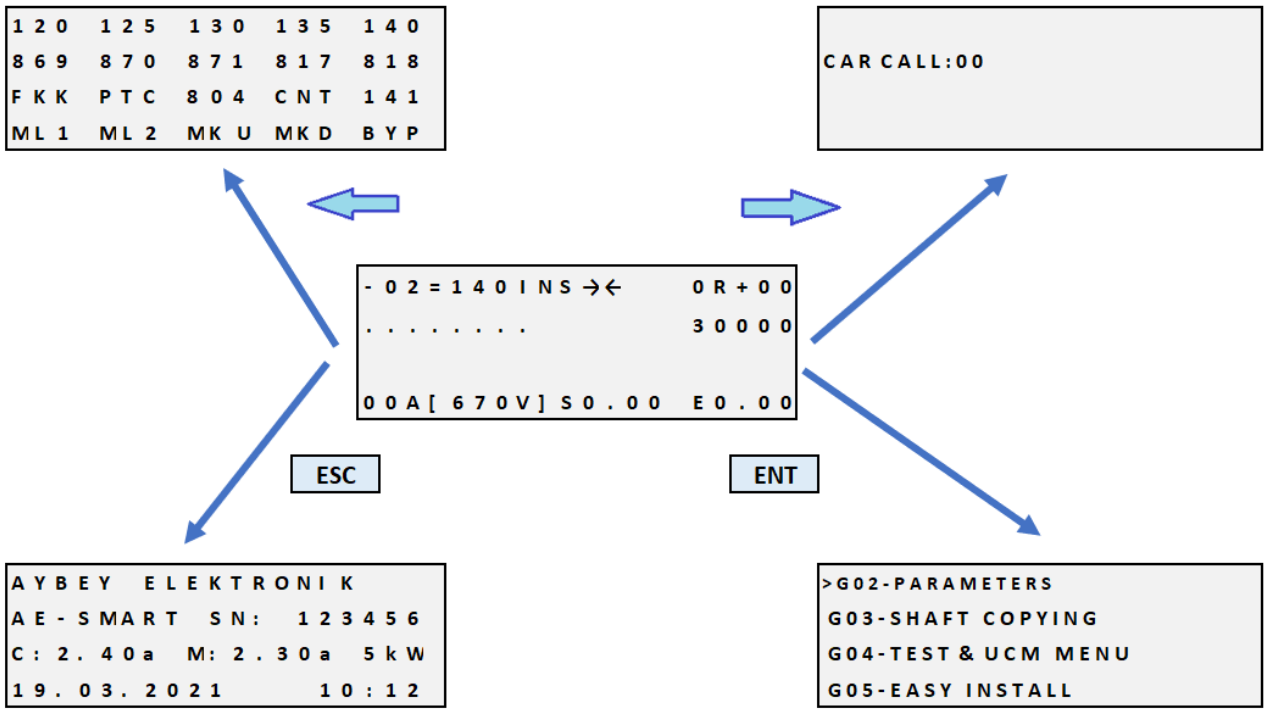
| | |
|---|---|
|  | Characters at position 17 give the following informations:<br>'**?**' Car Position has not been reset yet.<br>'**R**' Car Position reset is OK. Lift is simplex.<br>'**1**' Car Position reset is OK. Duplex lift with lift no 1.<br>'**2**' Car Position reset is OK. Duplex lift with lift no 2. |
|  | Position 18 gives information about internal board communication.<br>It must always be '+' for proper operation of the system.<br>Otherwise, there is an internal error. |
|  | The positions 19 and 20 give information about the status of the motion, controller and motor phases.<br>Related information can be found in section 5.1. |
|  | The second line of the main screen shows call registers.<br>There are as many characters there as the number of stops.<br>The types of the calls are represented as follows: |

| | | | | |
|---|---|---|---|---|
| ■ | No call | | ▲▬ | Car and Up Call |
| ▼ | Down call | | ▲▼ | Car, Up and Down call |
| ▲ | Up call | | ▬▼ | Car and Down Call |
| ▬ | Car call | | | |

| | |
|---|---|
|  | The 3rd line of the main screen shows the messages of system including errors. |
|  | The first two digits in the fourth line shows the motor current. |
|  | The number in square brackets shows dc Bus voltage. |

| | |
|---|---|
|  | The number after 'S' in fourth line shows instantaneous speed calculated by the system. |
|  | The number after 'E' in fourth line shows the speed read by the encoder. |

### 3.4 BUTTON FUNCTIONS IN MAIN SCREEN

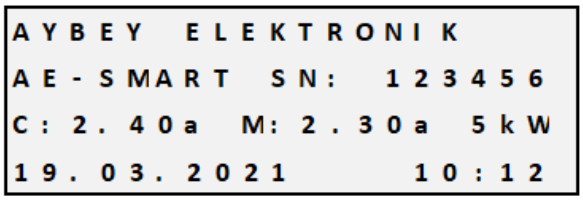



The functions of the buttons when pressed while main screen is being displayed are as follows:

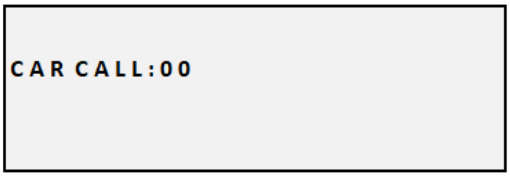
#### 3.3.1 Pressing ENT Button -> MAIN MENU

| | |
|---|---|
| | When **ENT** button is pressed then the main menu appears.<br><br>Menu tree and functions of the items will be explained in section 3.4.5 and 3.4.6 below. |

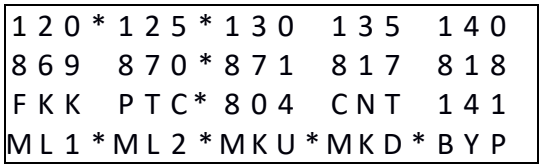
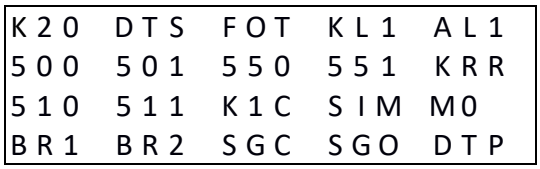
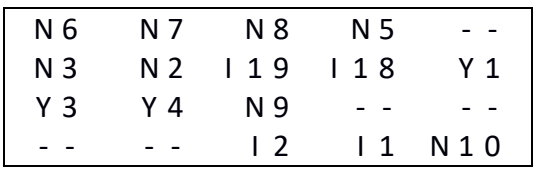
### 3.3.2 Pressing ESC Button -> INFO SCREEN

| | |
|---|---|
|  | When ESC button is in main then **info screen** will be displayed.<br>After a few seconds, the system returns to the main screen again. Pressing ESC button immediately exits to main menu. |
| Here:<br>SN: xxxxxxx shows the serial number of the device<br>**C: 2.40a** says the software version the **main controller**. It is here is 2.40a<br>**M:2.30a** says the software version the **motor driver**. It is here is 2.30a<br>**'5 kW:** gives the power of the device. It is here 5kW.<br>The lowest line shows **date** and **time**. | |

### 3.3.3 Pressing RIGHT Button -> GIVING CAR CALLS

| | |
|---|---|
|  | You can create car calls by pressing firstly (→) button and then giving the floor number you want to go. |

### 3.3.4 Pressing LEFT Button -> MONITORING OF THE STATES OF THE INPUTS

| | |
|---|---|
|  | When (←) button is pressed in main screen, then the system switches to the **monitoring input screens.**<br>As you can see there are certain numbers and '*' signs on this screen. When an input is active then it will have a **'*'** on its right side and the inactive ones will be blank. |
|  | Pressing **(↓)** button brings a new screen of inputs.<br>By using **(↓)** and **(↑)** buttons you can travel among in input state screens.<br>Press **ESC** to return to the main menu. |
|  | When **ENT** button is pressed while an input screen is displayed then the terminal names where the displayed inputs have been defined are shown.<br>So, you can easily see in which terminal the input function has been assigned.<br>The inputs ML1, ML2, PTC, FKK, CNT and safety line are predefined by the system in hardware and are not to be changed by user. Therefore, they are shown as "**fix**". |

### 3.3.5 MENU TREE

When you press ENT button in main screen you will enter the main menu.
The menu tree is as follows:

| | | |
|---|---|---|
| G01-MAIN MENU | » | P01-GROUP A PARAMETERS |
| | | P02-GROUP B PARAMETERS |
| | | P03-TIMER PARAMETERS |
| | | P04-SPEED PARAMETERS |
| | | P05-CONTROL PARAMETERS |
| | | P06-MOTOR PARAMETERS |
| | | P07-HARDWARE PARAMETERS |
| | | P08-DEFINE INPUTS |
| | | P09-SPECIAL PARAMETERS |
| | | P10-DEFINE OUTPUTS |
| G02-PARAMETERS | | |
| G03-SHAFT COPYING | » | 1-SHAFT LEARNING |
| | | 2-LEVEL ADJUST IN CABIN |
| | | 3-ENCODER FLOOR LEVELS |
| | | 4-ENC. ML MEASUREMENT |
| | | 5-ENC.LEARNING FLOORS |
| | | 6-RELEVEL START mm |
| | | 7-RELEVEL STOP mm |
| | | 8-REGISTER LEARN |
| | | 9-CLEAR ENCODER DATA |
| G04-TEST & UCM MENU | » | 1-AUTO TEST MENU |
| | | 2-UCM ERROR CLEAR |
| | | 3-UCM CONTROLLER |
| | | 4-UCM TEST |
| | | 5-LIMIT STOP TEST |
| | | 6-SAFETY GEAR TEST |
| | | 7-BUFFER TEST |
| G05-EASY INSTALL | | |
| G06-MOTOR TUNING | » | 1-START TUNING |
| | | 2-TUNING MODE |
| | | 3-ENCODER DIRECTION |
| | | 4-MOTOR DIRECTION |
| | | 5-ENCODER OFFSET |
| G07-FLOOR SETTINGS | » | 1-AUTO DISPLAY ADJUST |
| | | 2-FLOOR DISPLAYS |
| | | 3-ACCESS RIGHTS |

| | | |
|---|---|---|
| G08-SERVICES | » | 1-LANGUAGE |
| | | 2-PASSWORD SERVICE |
| | | 3-DATE & TIME |
| | | 4-MAINTENANCE DATE |
| | | 5-SIMULATOR MODE |
| | | 6-CLEAR LOAD DATA |
| | | 7-FACTORY DEFAULTS |
| | | 8-CLEAR ERROR LOG |
| | | 9-BACKUP TO DEVICE |
| | | 10-RESTORE EPROMS |
| G09-ERROR LOG | | |
| G10-COUNTERS | | |
| G11-OPERATIONS | | |
| G12-VARIABLES | » | 1-INFO SCREEN |
| | | 2-MAIN VARIABLES |
| | | 3-USER DEF.TIMERS |
| | | 4-BOARD VERSIONS |
| | | 5-SYSTEM TIMERS |

You can move in menu by using arrow keys and press ENT to select any submenu or operation.

### 3.3.6 MENU FUNCTIONS AND SUBMENUS

| | |
|---|---|
| >G02-PARAMETERS<br>G03-SHAFT COPYING<br>G04-TEST&UCM MENU<br>G05-EASY INSTALL | When **ENT** button is pressed then the main menu appears.<br>This is the starting point of the menu tree. From this point you can reach submenus for all parameters, variables and application menus in the system.<br>**(↑)** and **(↓)** buttons scrolls up and down the menu lines, respectively and **ENT** button selects the function denoted by **'>'** arrow. |
| **>G02-PARAMETERS**<br>G03-SHAFT COPYING<br>G04-TEST&UCM MENU<br>G05-EASY INSTALL | The generally used parameters can be reached under **G02-PARAMETERS** menu.<br>Be aware of that, there are lots of more parameters besides the ones reachable in this menu. They can be monitored under G01-MAIN MENU.<br>However, for most applications G02-PARAMETERS menu is sufficient. |
| [01] E01 : 1<br>LANGUAGE<br><br>ENGLISH | The generally used parameters can be reached under **G02-PARAMETERS** menu. |
| [02] A10 : 2<br>LIFT STANDARD<br><br>EN81-20/50 | You can travel among parameters by using **(↑)** and **(↓)** buttons. To change the parameter, press **ENT** button. |
| A10 : 2<br>LIFT STANDARD<br><br>EN81-20/50 | In parameter editing screen the value of the parameter can be changed by using arrow buttons. Pressing **ENT** saves the new value for the parameter. Pressing **ESC** leaves editing screen without changing the current value of the parameter. |
| G02-PARAMETERS<br>**>G03-SHAFT COPYING**<br>G04-TEST&UCM MENU<br>G05-EASY INSTALL | Through **G03-SHAFT COPYING** you can reach a sub menu where you can process the utilities when encoder is selected as floor selector. See **section 4.1** for detailed explanation. |
| G02-PARAMETERS<br>G03-SHAFT COPYING<br>**>G04-TEST&UCM MENU**<br>G05-EASY INSTALL | Through **G04- TEST & UCM MENU** you can reach a sub menu where you can process the utilities when related to UCM functions and lift test. See **section 4.2** for detailed explanation. |
| G02-PARAMETERS<br>G03-SHAFT COPYING<br>G04-TEST&UCM MENU<br>**>G05-EASY INSTALL** | **G05- EASY INSTALL** is a facility designed to be used for setting main parameters related to the lift during installation. Read explanation of parameter **[A15] INSTALLATION MODE.** |

| | |
|---|---|
| >G06–MOTOR TUNING<br>G07–FLOOR SETTINGS<br>G08–SERVICES<br>G09-ERROR LOG | When you press (→) button, next page of main menu appears on the screen.<br>**G06-MOTOR TUNING** contains a submenu related to motor and encoder functions. See **section 4.3** for submenu details. |
| G06–MOTOR TUNING<br>>G07–FLOOR SETTINGS<br>G08–SERVICES<br>G09-ERROR LOG | **G07-FLOOR SETTING** contains a submenu of utilities about display and access rights related to floors. Read **section 4.4** for a detailed discussion of floor selector types and shaft learning utilities. |
| G06–MOTOR TUNING<br>G07–FLOOR SETTINGS<br>>G08–SERVICES<br>G09-ERROR LOG | **G08-SERVICES** contains a submenu of various utilities about the system. See **section 4.5** for details. |
| G06–MOTOR TUNING<br>G07–FLOOR SETTINGS<br>G08–SERVICES<br>>G09-ERROR LOG | In **G09-ERROR LOG** you can see the error log. This is explained in **section 4.7**. |
| G09-ERROR LOG<br>>G10-COUNTERS<br>G11-OPERATIONS<br>G12–VARIABLES | In **G10-COUNTERS** you can monitor and edit the counters about lift travel. See **section 4.8**. |
| G09-ERROR LOG<br>G10-COUNTERS<br>>G11-OPERATIONS<br>G12–VARIABLES | **G11-OPERATIONS** contains some utilities and functions executed by giving a code. They are used only for reorganisation of some parameters. Use this section only by assistance of technical support team. |
| G09-ERROR LOG<br>G10-COUNTERS<br>G11-OPERATIONS<br>>G12–VARIABLES | Through **G12-VARIABLES** path you can reach a submenu containing some screens giving information about the internal variables of the system as well as external boards. See **section 4.9** for more information. |

# CHAPTER 4 - BASIC FUNCTIONS AND SERVICES

### 4.1 SHAFT COPYING SUBMENU

| | |
|---|---|
| **1-SHAFT LEARNING** | Execute this service if the floor selector is encoder and number of floors is greater than 2. This is an auto-learning process of the positions of the floors and shaft limits. |
| **2-LEVEL ADJUST IN CABIN** | This is a utility to adjust floor levels by moving the car inside it. |
| **3-ENCODER FLOOR LEVELS** | By using this menu, the floor levels can be adjusted by editing related data. |
| **4-ENC. ML MEASUREMENT** | Execute this service routine if the floor selector is encoder and number of floors is 2. Through this utility ML/pulse ratio is measured. After that you should execute **5-ENC.LEARN FLOORS.** |
| **5-ENC.LEARN FLOORS** | This utility learns the floor levels and shaft limits without changing ML/pulse ratio. |
| **6-RELEVEL START mm**<br>**7-RELEVEL STOP mm** | These lines are to edit A21 and A22 parameters which start and stop relevelling process. |
| **8-REGISTER LEARN** | A successful completion of an autolearning process is automatically registered. Some functions are not allowed without this registration. By using this utility, you can set or remove the registration manually. |
| **9-CLEAR ENCODER DATA** | This function is used to clear all data related to shaft and floor information. Then it sets them useful for simulation operation. |

### 4.2 TEST & UCM MENU

| | |
|---|---|
| **1-AUTO TEST MENU** | This is a lift travel test and explained in **section 4.2.1**. |
| **2-UCM ERROR CLEAR** | An UCM error is stationary and can be cleared by using this screen. |
| **3-UCM CONTROLLER** | The parameter defining UCM device,[A16], can be edited here. |
| **4-UCM TEST** | This test is to see the performance of UCM function of the lift and explained in **section 4.2.2**. |
| **5-LIMIT STOP TEST** | This test is to see the performance of the lift when any of the shaft limits has been exceeded and explained in **section 4.2.3**. |
| **6-SAFETY GEAR TEST** | This utility is to test the performance of the safety gear and explained in **section 4.2.4**. |
| **7-BUFFER TEST** | Not implemented yet. |

#### 4.2.1-AUTO TEST MENU

There is a special utility in system for testing the lift in normal operation. The doors or calls can be easily cancelled. A call to the top or bottom floor can be created and any number of random lift travels can be executed automatically.
This utility can be executed by pressing **TEST MENU** icon in main menu.
Test menu can be activated at any time.
The functions are as follows:

a) **Call to Top Floor:** A car call to the top floor is created.
b) **Call to Bottom Floor:** A car call to the bottom floor is created.
c) **Calls:** Car and Landing cars are disabled or enabled. When disabled '-' sign and when enabled '+' sign is shown.
d) **Doors:** Doors can be disabled or enabled. When enabled '+' sign is shown and the door opens normally. When disabled '-' sign is shown and the door does not open when arrived at the floor.
e) **Random Calls:** A number is entered to the system. The lift starts by generating calls for a random floor as many times as the number entered, automatically. The condition specified by doors remains during the test. This procedure is usually carried out to test a new lift before giving it to the service.

### 4.2.2 UCM TEST

**Warning**

Before starting this test process, be ensured that there is nobody or any load inside the cabin and prevent usage of the lift. In order to be able to perform the test, the system must be in the normal mode and the cabin light (Busy signal is off) must be turned off to ensure that the lift is not in use. Test operation cannot be performed in inspection mode.

**Test Procedure**

**a.** SELECTING TEST SPEED: "TEST SPEED: SLOW" is displayed on the screen. You can switch between HIGH and SLOW speeds by pressing RIGHT (>) and LEFT (<) buttons. Confirm the selected test speed.
**b.** SELECTING TEST DIRECTION: You can switch between UP and DOWN speeds by pressing (↑) or (↓) buttons. Confirm the selected test direction.
**c.** In next step, "UCM TEST START" is displayed on the screen. Press (↑) button to start manual test.
**d.** Manual test has been started by the controller by opening the door. When door starts to open, the return of the safety line becomes open circuit (140=0).
**e.** Then the controller activates the door bridging process through SDB board which makes the return of the safety line ON (140=1).
**f.** When the safety line is open and door circuit has been bridged the system is activated.
**g.** If the machine is geared, then overspeed governor coil is energized. When the signal at the SGO input is off, then the controller initiates motion in selected speed and direction.
**h.** If the machine is gearless (synchronous motor) then the controller initiates motion in selected speed and direction.
**i.** When the car goes out of the door zone (ML1=0 or ML2=0) with open doors then the controller considers it as UCM and the car is stopped immediately. Contactors and the door bridging are switched off. All adjusted delays of the switching elements in stopping are disregarded.
**j.** The car position, namely the vertical distance from the cabin sill to the floor level should be measured. It should be within the limits specified in clause 5.6.7.5 of EN 81-20.

**k.** The controller enters in the BLOCK mode. It does not respond to calls. “Error No: 72 '' UCM ERROR '' is displayed on the screen. This is an UCM error and it is permanent. The lift can return to the normal mode only after clearing this error by menu. SERVICES -> UCM ERROR CLEAR.

**l.** If no error has been generated by the controller while the car is travelling outside of door zone with open doors then we can decide that UCM detection or activation of the system is not responding properly. A careful check of parameters, input and output settings and wire connection must be carried out. After fixing the problem this test must be repeated before giving the lift to the service.

### 4.2.3 LIMIT STOP TEST

The performance of the shaft limit switches can be tested by using this test. To start the test the following conditions must be met:
- The car must be at bottom floor to test bottom limit switch.
- The car must be at the top floor to test top limit switch.
- The lift must be in Normal operation mode.
- Busy signal must be off.

When executed, the lift moves up (at top floor) or down (at bottom floor) in creeping speed [S08] in order to exceed shaft limits. The travel is terminated by opening the limit stop switches. So, the emergence of the stop error indicates that the limit switches are working properly. If no stop error is created then it means the limit switch is not working as required.

### 4.2.4 -SAFETY GEAR TEST

This test is purposed to test safety gear by deactivating the coil on the speed governor. It starts the motion without activating OSG coil. When the car starts motion the safety gear must be activated. If this happens, then it means that the safety gear functions properly.

### 4.3 MOTOR TUNING

| | |
|---|---|
| **1-START TUNING** | This utility is used for tuning of motor before running. Read and follow the instructions in installation manual. |
| **2-TUNING MODE** | Here, tuning mode is set as rotating or stationary. [M18] |
| **3-ENCODER DIRECTION** | Editing of parameter[M17] for encoder direction. |
| **4-MOTOR DIRECTION** | Editing of parameter[M19] for motor direction. |
| **5-ENCODER OFFSET** | Editing and monitoring of parameter[M15] for encoder offset. |

### 4.4 FLOOR SETTINGS

| | |
|---|---|
| **1-AUTO DISPLAY ADJUST**<br><br>AUTO DISP. ADJUST<br>1<br>LOWEST FLOOR NO : [ 0 ]<br>**(↑↓)** ---- | By using this utility, the floor displays can be set automatically. In this application you will be asked for entering the display of the lowest floor. You can set it to a positive as well as a negative number by using **(↑)** and **(↓)** buttons. Pressing ENT after that will save the displays for all floors. |
| **2-FLOOR DISPLAYS**<br><br>> D 0 2 . F L R : 2<br>D 0 3 . F L R : 3<br>D 0 4 . F L R : 4<br>D 0 5 . F L R : 5 | In this application you can edit the display of any floor manually.<br>For each floor two digits are registered, one for left and one for right. Therefore, you can edit both digits for a floor separately. In serial display modules both digits will be displayed. However, in parallel floor and car displays the left display can show only '-' or '1' characters. |
| **3-ACCESS RIGHTS**<br><br>> L 0 1 . F L R : 1 1<br>L 0 2 . F L R : 0 0<br>L 0 3 . F L R : 1 1<br>L 0 4 . F L R : 1 0 | This menu is to control the access of car and landing call acceptance.<br><br>The first column is for car and second one is for hall calls. |
| 1 . FLR : CALL RIGHTS<br><br>CAR: 1 FLR: 0<br>ON OFF | After selecting any floor, you can allow its car and /or calls by setting 1.<br><br>Similarly, you can inhibit them by setting 0 for any one. |

### 4.5 SERVICES

| | |
|---|---|
| **1-LANGUAGE** | Editing parameter [E01] Menu Language. |
| **2-PASSWORD SERVICE** | You can change your password through this utility. Upon entering this menu, system asks for the current password. If you enter the password correctly, system permits you to change system password to a number between 0 and 32.000. |
| **3-DATE & TIME** | Date and Time of the device can be set with this utility. |
| **4-MAINTENANCE DATE** | The system has a real time clock. In order to stop the lift operation due to a time limit you can set the maintenance time for a future date. If date and time is greater than maintenance date, then the lift enters into maintenance mode and does not start any more. One should set the maintenance time for a later date to enter into normal mode.<br>Setting **day** or **month** as 0 disables maintenance due to time. |
| **5-SIMULATOR MODE** | Editing [A19] Simulator Mode parameter. See **section 8.2** for application. |

| | |
|---|---|
| **6-CLEAR LOAD DATA** | This function is used, when a car-load measuring device is used for pre-torque. This utility clears all data related to car load. |
| **7-FACTORY DEFAULTS** | When you are starting with the controller or you want to clear all current parameters to reorganize them, you can set them to factory defaults. In this operation all parameters are first cleared and then set according to the lift type you have specified. |
| **8-CLEAR ERROR LOG** | Executing this utility clear error log. |
| **9-BACKUP TO DEVICE** | By using this utility, the current parameters can be saved into a separate memory location inside the controller. This backup set of parameters are not open to any modification. |
| **10-RESTORE EPROMS** | Any set of parameters or data saved into the device can be restored by using this utility.<br>0. INPUT DEFINITIONS : input definitions are restored.<br>1. OUTPUT DEFINITIONS: output definitions are restored.<br>2. ALL PARAMETERS: all parameters (A,B,T,E,S,M,C,H) are restored.<br>3. TIMERS: timers are restored.<br>4. MOTOR DRIVER PAR.: Parameters (S,M,C) are restored.<br>5. PARAM.A+B+E: Parameters (A,B,E) are restored.<br>6. ACCESS CONTROL: access control parameters are restored.<br>7. FLOOR SETTINGS: Floor displays are restored.<br>8. ENCODER DATA: Encoder data is restored. |

### 4.6 MAINTENANCE CONTROL

There are two independent control systems for maintenance mode activation. The first one is setting a maintenance time in the future and the second one is specifying a maximum number of starts for the lift. If the adjusted maintenance time or number of starts exceeds adjusted maximum values for maintenance, then the lift switches to maintenance mode and does not accept any calls. To return the lift to the normal operation mode related limit values for maintenance must be reset. Both maintenance systems can be active simultaneously.

### 4.7 ERROR LOG

| | |
|---|---|
| The system saves last 128 errors with date, time and state variables at the instant of occurrence of error.<br>Old errors can be seen in **G09-ERROR LOG** in main screen. You can move among old errors by using using **(↑)** and **(↓)** buttons. Pressing **ENT** button opens a page showing details of the lift at the instant of error. | ERROR: 8 [ 1]<br>DOOR NOT CLOSED<br>12. 03. 2021 - 11:41<br>**(↑↓ ENT)** |
| There are eight lines of information about the state of the lift at the instant of error occurrence. You can move in the screen by using **(↑)** and **(↓)** buttons. Pressing **ESC** leaves this screen. | ↑12. 03. 2021 - 11:41<br>FLR : 4 =<br>Mod: 1<br>↓ Cont./Mot.-Phase: 10 / 0 |

## 4.8 COUNTERS

The system holds some travel and direction counters. These counters hold the number of starts of the lift and can be used for maintenance control. They are listed in six screens. You can move among counter screens with (↑) and (↓) buttons. The explanation for them is found in the table below:

| | |
|---|---|
| Total Number of<br>Starts of the Device<br>[1] xxxxxxx<br>**(↑↓)** | This counter stores **Total Number of Starts** of the device.<br>It cannot be edited. |
| Number of Travels<br>After reset<br>[2] xxxxxxx<br>**(↑↓ ENT)** | This counter holds the number of **STARTS** after last reset.<br>It is called **STARTS COUNTER**.<br>This counter can be reset by pressing **ENT** button here. |
| Number of Starts<br>Set for Maintenance<br>[3] xxxxxxx<br>**(↑↓ ENT)** | This counter is used as an alarm for maintenance.<br>You can set the number of starts to maintenance by pressing **ENT** button in this screen. |
| MAX.START COUNTER<br>xxxxxxx | If the value of the counter is set to zero, then this function is inhibited and no alarm is activated.<br>If any nonzero value is set as MAXIMUM START COUNTER, then when …<br>**STARTS COUNTER> MAXIMUM START COUNTER** the system will enter into maintenance mode. |
| Remaining Starts<br>until Maintenance<br>[4] xxxxxxx<br>**(↑↓)** | You can see on screen [4] remaining starts to maintenance alarm, namely …<br>(MAXIMUM START COUNTER- STARTS COUNTER). |
| Number of<br>Direction Changes<br>[5] xxxxxxx<br>**(↑↓ ENT)** | This counter is called as **DIRECTION COUNTER** and incremented after each reversal of the motion direction.<br>It can be reset by pressing **ENT** button. |
| Number of maximum<br>Direction Changes<br>[6] xxxxxxx<br>**(↑↓ ENT)** | Here you can monitor **MAXIMUM DIRECTION CHANGE**.<br>It can be edited by pressing **ENT** button. |
| SET MAX. DIR CHANGE<br>xxxxxxx | If MAXIMUM START COUNTER is zero, then this function is inhibited and no alarm is activated.<br>If it is greater than zero, it will be active. When **DIRECTION COUNTER > MAXIMUM DIRECTION COUNTER,** then the system will enter into maintenance mode. |

### 4.9 VARIABLES

Variables menu contains information about internal variables and software versions of the boards in the system.

| | |
|---|---|
| **1-INFO SCREEN** | Gives some information about the device configuration as shown in **section 3.4.2**. |
| **2-MAIN VARIABLES** | Gives the state of the internal variables. |
| **3-USER DEF.TIMERS** | Gives the instantaneous count value of user defined timers |
| **4-BOARD VERSIONS** | Lists the software versions of the electronic boards connected to the system. |
| **5-SYSTEM TIMERS** | Gives the instantaneous count value of user system timers |

# CHAPTER 5 – LIFT SOFWARE BASICS

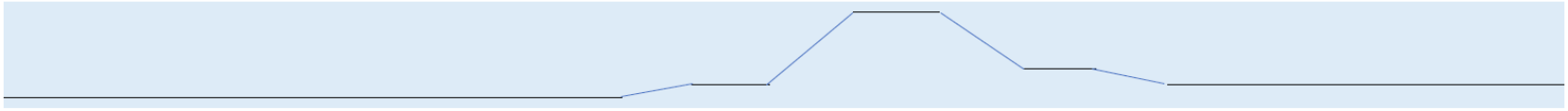
### 5.1 TIMING

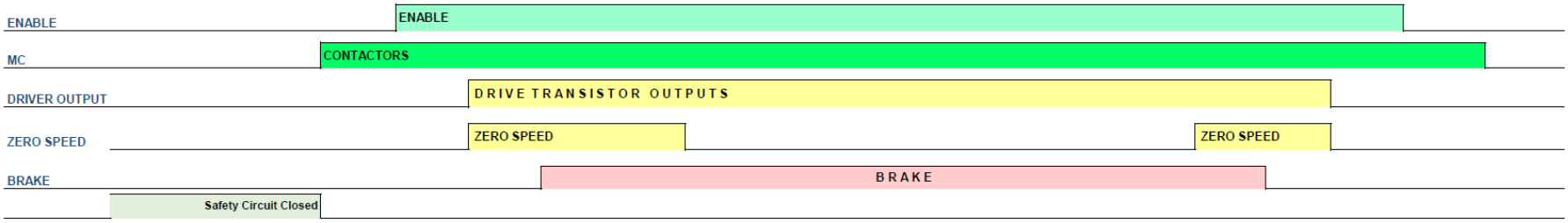
The timing diagram is shown on the next page. The device has two main variables related to motion phases and device stages. This diagram shows what happens when a motion request is received. The line indicated as **control** shows controller stages and the one indicated as **motor** motion phases. These two variables are displayed on the screen of the hand terminal to give information about the motion state of the device (control/motor). It can be easily seen on the timing diagram how the active and passive states of device motor output, brake, enable and contactor are changing. By using these two variables, related stages in the time diagram can be identified.

| Control phase | Motor phase | Motion | Action | |
|---|---|---|---|---|
| 0 | 0 | No motion | no request for motion | |
| 10 | 0 | No motion | there is a request for motion | Checking Safety Line |
| 20 | 0 | No motion | Contactors are activated | Safety Line closed |
| 35 | 0 | No motion | Motor Driver enabled | |
| 40 | 41 | No motion | Zero Speed | |
| | 42 | No motion | Brakes are opened | |
| | 43 | Motion | Starting Speed Ramp | Starting Speed |
| | 44 | Motion | Starting Speed Travel | |
| | 45 | Motion | Accelerating | Normal Travel |
| | 46 | Motion | Constant Speed | |
| | 47 | Motion | Decelerating | |
| | 48 | Motion | Creeping Speed | Seeking Floor Level |
| | 49 | Motion | Stopping | Speed down to zero |
| 38 | 59 | Motion | Stop Speed detected | Zero Speed at Stop |
| | 60 | No motion | Brake off | |
| | 61 | No motion | End of motion | |
| 33 | 0 | No motion | Motor Driver disabled | Motion completed |

# TIMING CHART

| stage | REST | REST | READY | CONT_ON | ENB_ON | TRAVEL | | | | | | | | | | AT_STOP | | | ENB_OFF | REST |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| stage | 0 | 0 | 10 | 20 | 35 | 40 | | | | | | | | | | 38 | | | 33 | 0 |
| mphase | 0 | 0 | 0 | 0 | 0 | 41 | 42 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 59 | 60 | 61 | 0 | 0 |
| | CONTROLLER | | | | | MOTOR CONTROL | | | | | | | | | | | | | CONTROLLER | |
| | idle | Normal Mode: Calls are received<br>Other Modes: Motion request | Close Door Check Inputs Check Safety Activate SG Coil | wait for Start Timer<br>Contactors ON | Drive Outputs Are Enabled (no time delay only EN checking ) | Zero Speed At Start | | | < Motor rotates – Lift moves > | | | | | Seeking Floor Level | Down to Zero | Zero Speed At Stop | | INVERTER OFF | Drive Outputs Are Disabled | Job Completed |
| | | | | | | DriveON | BrakeON | BrakeON | Ramp Period to Start Speed | Starting Speed | < Normal Travel > | Accelerating | Constant Speed | Decelerating | Creeping Speed | Stopping | Stopping Speed Detected | Brake Off | job Completed | | |





## 5.2 COLLECTING CAR POSITION INFORMATION

System can use encoder or magnetic switches to collect car position information.
817 and 818 switches are always used to check shaft ends. These are bi-stable magnetic or mechanical switches. 818 must be open at top and 817 at bottom limits paths and closed between these limits. These are used as reference points at top and bottom floors.
The consistency of the car position data is always checked at these limit points.

**FLOOR SELECTOR MODES**

**Counter Mono-Stable Switch [A05=0]: ML1, ML2, MKD and MKU** normally open (KPM206) magnet switches are used and releveling is allowed.

**Counter Bi-Stable Switch [A05=1]:** M0 and MK Bi-stable magnet switches (KPM205) are used and releveling is **not** allowed.

**Motor Encoder [A05=2]:** No additional hardware is required. This option is only available in closed loop systems where the motor has an encoder, [A03=1,2].

a) **With Releveling: ML1, ML2, MKD and MKU** normally open (KPM206) magnet switches are used. To allow releveling, select [A11=0].
b) **Without Releveling**: **ML1 and ML2** normally open (KPM206) magnet switches are used.

**Shaft Encoder [A05=3]:** In this method a standalone shaft encoder fixed to the car with a rope. Is used. An **ENC** encoder interface board must be used to read the shaft encoder. In this method relevelling is allowed. Select [A05=3] for shaft encoder and set [A11=1], if releveling is requested. To install shaft units and adjust related parameters read **AE-SMART FLOOR SELECTOR INSTALLATION MANUAL.**

## 5.3– RESCUE SYSTEMS

### 5.3.1 ELECTRONIC RESCUE SYSTEMS

In AE-SMART control system has built in software to manage automatic rescue system (ERS) to rescue the passengers in case of power failure. Electronic Rescue System automatically switches on when the controller detects an error in mains phases.

| **The parameters used in Rescue Operation** | |
|---|---|
| **[A23] RESCUE OPERATION ALLOWED** | Emergency rescue operation is carried out only if [A23=1]. |
| **[A24] EKS VOLTAGE** | Voltage supplied to the device in case of rescue operation. |
| **[T36] MAX. RESCUE PERIOD** | If the rescue operation cannot be completed within the time period specified in this parameter, the controller terminates the rescue operation. |
| **[T32] ERS DOOR WAIT PERIOD** | Defines the time period in which the doors will wait open after reaching floor in a rescue operation. |
| **[B20] ERS MK DELAY** | It defines the delay required to stop the lift in exact floor level in rescue mode. Since the lift rescue speed is much lower than the travel speed, the car may not reach to the floor level when the stop command is activated. To reach to the floor level the car motion can be extended (stopping delayed) related to this time period. |

**The device is produced with or without ERS system.**

**A) AE-SMART with Integrated Electronic Rescue System**

Models **7xxJxxx** is delivered with integrated rescue system. You should connect only **5x12VA** batteries BAT+ and BAT- terminals with the supplied red and black cables. Be careful to connect red cable to (+) and black cable (--).

**B) AE-SMART with External Rescue System**

Models **7xxBxxx** is delivered with no rescue system inside the device. However, you can connect a rescue system to the device later.

A UPS or a system with a UPS+batteries can be used as rescue power source. Please refer to the electric diagrams to see how to connect them to AE-SMART.

### 5.3.2 MANUAL RESCUE SYSTEM

If the controller is powered by line or any other emergency power supply, then in all models RECALL system can be used to rescue the passengers in the cabin.
In Model D and E brake opening system is present. The car can be moved by opening brakes. Related instructions are at the backside of the cover of the device.

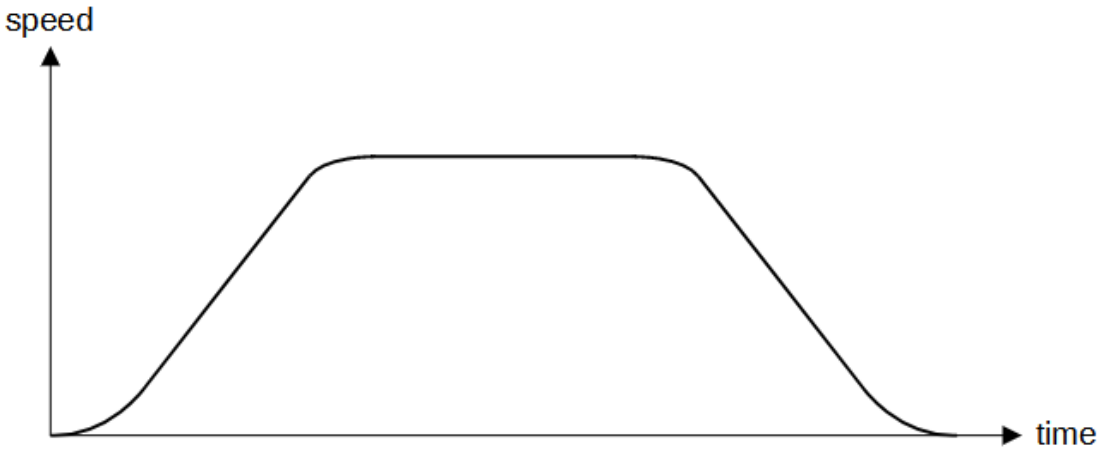
## 5.4 SPEED CURVES

### 5.4.1. Distance based Operation:

When encoder is selected as floor selector[A05=2,3], then distance dependent travel system is automatically activated. In this case all speed switching points are calculated by the device. The travel speed is selected relative to the distance to the target floor. Short floors can be managed easily.

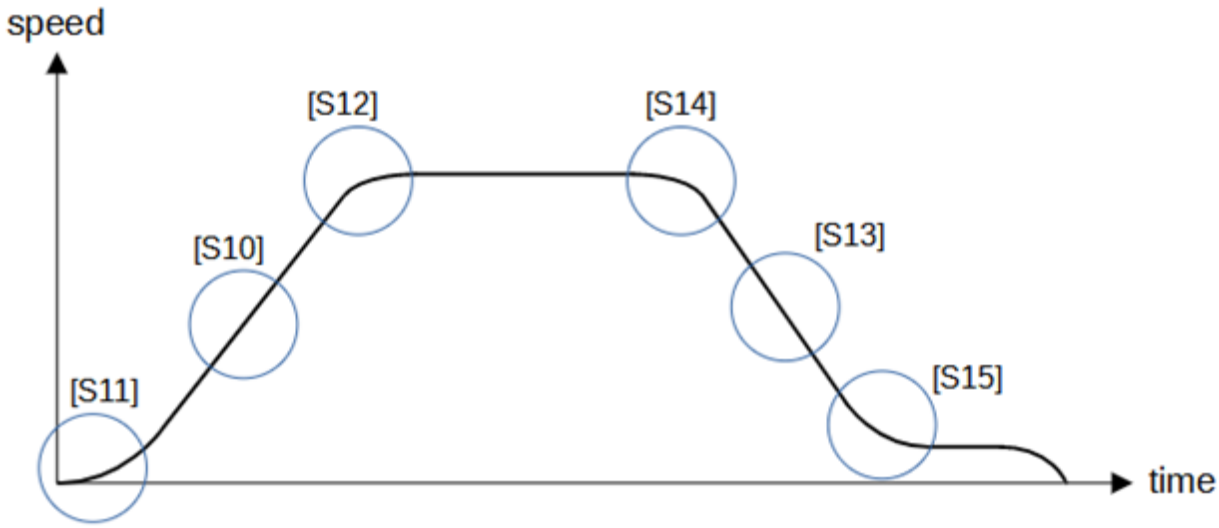
**a) Direct Landing**

To activate direct landing system parameter S23 must be greater than zero **[S23=1,2,3].** In this case the system adjusts acceleration and deceleration curves regarding to the selection in parameter S23.



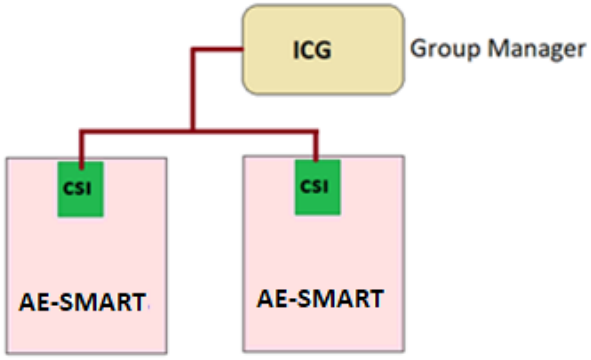
### b) Using Creep Speed

If **[S23=0]** then the system uses creeping path before stopping. Access to all speed curve parameters is allowed. User can design any travel curve by adjusting parameters S11…S15. If floor selector is not encoder [A05=0,1] or open loop system is used [A03=0] then automatically system switches to this method.




## 5.5 DUPLEX OPERTION

System can work in lift groups up to eight lifts. Each group lift must have **CSI** Can interface board plugged into. One group controller device ICG must be used as group manager. Communication between ICG and group lifts is carried out by CAN-BUS. It is low speed, fault tolerant.

| | |
|---|---|
| Related Parameters in Group Operation<br>• [A07] GROUP NUMBER<br>• [A02] COMMAND SYSTEM<br>• [B12] BASE FLOOR (GROUP LIFT)<br>• [T29] GRUP DOOR WAIT |  |

# CHAPTER 6 – INPUT AND OUTPUT FUNCTIONS

### 6.1 INPUT FUNCTIONS

There are a number of defined input functions in software. Some input terminals are assigned to a specific function as default by the system, such as [ML1], [ML2] and safety line whereas the others are programmable. Any input function can be assigned to any programmable input terminal by using **G02-PARAMETERS** menu. One input function cannot be assigned more than one input terminal.

| INPUT NO | INPUT CODE | INPUT FUNCTION | DEFINITION | ACTIVE STATE |
|---|---|---|---|---|
| 1 | 869 | Car Top Inspection Switch | USER | OFF |
| 2 | 870 | Recall Operation Switch | USER | ON |
| 3 | 871 | Pit Inspection Switch | USER | OFF |
| 4 | 817 | High Speed Limit at bottom | USER | OFF |
| 5 | 818 | High Speed Limit at top | USER | OFF |
| 6 | 500 | Car Inspection Motion Button Down | USER | ON |
| 7 | 501 | Car Inspection Motion Button Up | USER | ON |
| 8 | 550 | Recall Motion Button Down | USER | ON |
| 9 | 551 | Recall Motion Button Up | USER | ON |
| 10 | BYP | Bypass Switch | USER | OFF |
| 11 | 510 | Pit Inspection Motion Button Down | USER | ON |
| 12 | 511 | Pit Inspection Motion Button Up | USER | ON |
| 13 | KRR | Pit Inspection Reset Switch | USER | TOGGLE |
| 14 | MKD | Stopper in down direction | USER | ON |
| 15 | MKU | Stopper in up direction | USER | ON |
| 16 | 804 | Overload contact (NO) | USER | ON |
| 17 | 805 | Full Load Contact | USER | ON |
| 18 | K20 | Door Open Button for Door 1 | USER | ON |
| 19 | DTS | Door Close Button for Door 1 | USER | ON |
| 20 | FOT | Photocell Contact for Door 1 | USER | ON |
| 21 | AL1 | Door Open Limit for Door 1 | USER | ON |
| 22 | KL1 | Door Close Limit for Door 1 | USER | ON |
| 23 | K1C | Obstruction Contact for Door 1 | USER | OFF |
| 24 | BR1 | Brake Contact of the traction machine (Brake 1) | USER | info |
| 25 | BR2 | Brake Contact of the traction machine (Brake 2) | USER | info |
| 26 | SGC | Overspeed Governor Contact (Normally Closed) | USER | info |
| 27 | SGO | Overspeed Governor Contact (Normally Open) | USER | info |
| 28 | DTP | Door Motor Temperature<br>If the door motor overheats then this input function is activated and the controller prevents any motion. | USER | OFF |
| 35 | PFK | When activated it means that safety gear has been enabled. | USER | OFF |
| 36 | EKS | RESCUE switch<br>If this input is active and FKK input is inactive at start-up, then the system starts in Rescue mode. | USER | ON |

| INPUT NO | INPUT CODE | INPUT FUNCTION | DEFINITION | ACTIVE STATE |
|---|---|---|---|---|
| 37 | HD | High speed limit in down direction<br>This input is used in lift applications above 1,2 m/s | USER | OFF |
| 38 | HU | High speed limit in up direction<br>This input is used in lift applications above 1,2 m/s | USER | OFF |
| 39 | | Not used | | |
| 40 | M0 | Floor counter input for bi-stable magnetic switches when A05=1. | USER | info |
| 41<br>42 | FR1<br>FR2 | Fire Input Switch<br>An active signal at this input switches the system to fire mode. | USER | Refer to [B40] |
| 43 | FRM | Fireman Switch at the ground floor. | USER | ON |
| 44 | FRC | Fireman Switch in car panel. | USER | ON |
| 45 | DSB | Disable Switch<br>When this switch is active, any lift motion is inhibited. However, relevelling will be carried out when needed. | USER | ON |
| 46 | VP1 | VIP input 1<br>When an active signal is present at this input then the lift moves to the floor specified in parameter [B23] 1st VIP FLOOR | USER | ON |
| 47 | VP2 | VIP input 2<br>When an active signal is present at this input then the lift moves to the floor specified in parameter [B24] 2nd VIP FLOOR | USER | ON |
| 48 | VP3 | VIP input 3<br>When an active signal is present at this input then the lift moves to the floor specified in parameter [B25] 3th VIP FLOOR | USER | ON |
| 49 | THR | Machine Room temperature control input.<br>This input is used to get information about the machine room temperature. When the machine room temperature is outside the defined temperature range defined in lift standard then this input should be ON by an external temperature measuring device. | USER | OFF |
| 50 | LDB | Loading Button<br>This input function is used to hold automatic door open for a long-period of time during loading. Holding time is determined by parameter [T39] LOADING PERIOD. Any door close request except DTS will be ignored during this period. | USER | ON |
| 51 | WTM | Liftman Switch<br>When activated hall calls are inhibited. | USER | ON |

| INPUT NO | INPUT CODE | INPUT FUNCTION | DEFINITION | ACTIVE STATE |
|---|---|---|---|---|
| 52 | UCR | This input can be used to clear a raised UCM ERROR. If there is an active UCM error present then changing the state of this input (toggle switch), when the lift is in inspection mode and resting, clears the error. | USER | TOGGLE |
| 57 | 802 | Minimum Load Contact<br>If there are no load or person inside the cabin, then this input should be ON when used. | USER | ON |
| 58 | PNB | Panic Button<br>When this input is ON then the lift travels immediately to the panic floor defined in [B28]. | USER | ON |
| 61 | DPM | Earthquake Alarm Input<br>When this input function is active (OFF), then the controller enters earthquake mode. The lift will go to the nearest floor when it is in motion. When the lift is in rest then any motion request is prohibited.<br>It has the same function as DEP input but with reverse input polarity. | USER | OFF |
| 62 | SIM | Simulation mode input<br>See Section 8.2. | USER | ON |
| 63 | FE1 | Photocell Error- door 1<br>This input should be connected to the error output of the photocell unit employed for the door 1. | USER | ON |
| 68 | PER | Emergency Phone Error.<br>An error in emergency phone activates this input to acknowledge the system. | USER | ON |
| 69 | FI1 | Special Input 1<br>FREE OUTPUT-1, in programmable outputs, follows this input. If FI1 is ON then FREE OUTPUT-1 is ON and vice versa. The function of this input is only to transfer one digital output anywhere in the shaft to any other place in the shaft by using intelligent CAN boards in the system. | USER | ON |
| 70 | FI2 | Special Input 2.<br>It manages FREE OUTPUT-2 in the same way as FI1. | USER | ON |
| 71 | FI3 | Special Input 3.<br>It manages FREE OUTPUT-2 in the same way as FI1. | USER | ON |
| 72 | CDC | If this input has been activated, then all pending car calls are cleared. | USER | ON |
| 73 | CDH | If this input has been activated, then all pending hall calls are cleared. | USER | ON |
| 74 | CDA | If this input has been activated, then all pending calls (car + halls) are cleared. | USER | ON |
| 78 | 814 | Overload contact (NC). It is inverse function of 804. Overload is active if this input is OFF. | USER | OFF |

| INPUT NO | INPUT CODE | INPUT FUNCTION | DEFINITION | ACTIVE STATE |
|---|---|---|---|---|
| 81 | MRC | Manuel Rescue<br>If the car is moved only by opening brakes manually then MRC input should be activated to monitor car speed on the led displays on the device. See 5.3.2. | USER | ON |
| 82 | LS1 | Load Sensor 1<br>LS1 is used in pre-torque application when [S19=4]. See section 8.1.2. | USER | ON |
| 83 | LS2 | Load Sensor 2<br>LS2 is used in pre-torque application when [S19=4]. See section 8.1.2 | USER | ON |
| 84 | LS3 | Load Sensor 3<br>LS3 is used in pre-torque application when [S19=4]. See section 8.1.2 | USER | ON |
| 85 | DEP | EARTHQUAKE NO-CONTACT<br>When this input function is active (ON), then the controller enters earthquake mode. The lift will go to the nearest floor when it is in motion. When the lift is in rest then any motion request is prohibited.<br>It has the same function as DPM input but with reverse input polarity. | USER | ON |

### 6.2 OUTPUT FUNCTIONS

Each output function can be assigned to any output terminal. One output function can be assigned to more than one output terminal. When the condition of the output function is realized then this output is set, namely its contact will be closed. Any output function can be assigned to any programmable output terminal by using **G02-PARAMETERS** menu.

| CODE | OUTPUT FUNCTION | EXPLANATION |
|---|---|---|
| 1 | MC CONTACTOR | Main contactor output. MC connects the output of system to the motor. |
| 2 | BRAKE CONTACTOR | Brake contactor output. Brake contactor energizes the coils of the motor brake. |
| 3 | INSPECTION | System is in inspection mode. |
| 4 | NORMAL OPERATION | System is in normal mode. |
| 5 | FAULT STATE | There is an error in operation. |
| 6 | NO ERROR | There is no errors in the system. |
| 7 | START | Start of the motion. There is a motion request. System is preparing to start motion. But there is no motion yet. |
| 8 | IN MOTION | The car is moving |
| 9 | NO MOTION | The car is resting. |
| 10 | 140 IS ON | 140 Terminal is ON |
| 11 | 140 IS OFF | 140 Terminal is OFF. |
| 12 | AT DOOR ZONE | The car is at door zone. |
| 13 | RESTING IN DOOR ZONE | The car resting at door zone. |
| 14 | DIRECTION UP | Motion Direction is up |
| 15 | DIRECTION DOWN | Motion Direction is down |
| 16 | BUSY ON | System is busy (cabin light is on) |
| 17 | NOT BUSY | System is not busy (cabin light is off) |
| 18 | 120 OFF | 120 (stop circuit) is closed. |
| 19 | 120 ON | 120 (stop circuit) is open. |
| 20 | PARK TIME | The controller is waiting for park period. |
| 21 | LEVELLING | The car is in levelling motion. |
| 22 | FIRE ALARM | Fire signal is active. (FR1or FR2) |
| 26 | RETIRING CAM | Retiring cam output |
| 27 | OUT OF SERVICE | Lift is not in service. |
| 28 | OVERLOAD | Overload signal is active (804 input is active) |
| 29 | MAX START COUNTER | Number of starts exceeded maximum number of starts. |
| 30…35 | B0…B5 | Binary code outputs. Bits B0…B5. |
| 36 | POWER LINE OK | Power line is OK. |
| 37 | POWER NOT PRESENT | No voltage in power line inputs. |
| 38 | IN RESCUE MODE | The lift is in rescue mode. |
| 39 | NOT RESCUE MODE | The lift is not in rescue mode. |
| 40…45 | M0…M5 | Gray code outputs. Bits M0...M5. |
| 46 | VIP TRAVEL – PRIORITY TRAVEL | System is in VIP or priority mode. |
| 47 | NEXT DIRECTION UP | Next direction arrow up. |

| CODE | OUTPUT FUNCTION | EXPLANATION |
|---|---|---|
| 48 | NEXT DIRECTION DOWN | Next direction arrow down. |
| 49 | LIFTMAN | Liftman |
| 50 | FAN | Fan output. |
| 51 | HIGH TEMPERATURE | This output is activated if temperature is higher than the value stored in parameter [B29]. |
| 52 | LOADING BUTTON | Loading period [T39] is activated by LDB input. |
| 53 | MC CONTACTOR IS OFF | Motor contactor is not active. |
| 54 | NO CALLS | There is (are) registered call(s). |
| 55 | SLOW CLOSE -1 | When the photocell of the first door is blocked for a longer period than [C34] then the door starts closing in slow motion. This output is for slow closing of door-1. |
| 57 | SPEED GOVERNOR COIL | Output for speed governor coil. |
| 58 | CLOSE 1st DOOR | Door close output for door 1. |
| 59 | OPEN 1st DOOR | Door open output for door 1. |
| 62 | BYPASS WARNING | When the lift is in bypass mode this output is active. |
| 63 | SYSTEM IS BLOCKED | If the lift is blocked or put into out of service mode due to an error, then this output is active. |
| 64 | FIRE NO-ENTRANCE | No-Entrance output |
| 65 | GOVERNOR CONTROL | Governor Output symbol |
| 67 | CAR INSPECTION | In inspection mode due to car inspection switch |
| 68 | PIT INSPECTION | In inspection mode due to pit inspection switch |
| 69 | INSPECTION CAR+PIT | Inspection switches of car and pit are both active simultaneously. |
| 71 | FREE OUTPUT 1 | It's active when free input 1 (69) is active |
| 72 | FREE OUTPUT 2 | It's active when free input 2 (70) is active |
| 73 | FREE OUTPUT 3 | It's active when free input 3 (71) is active |
| 74 | ALARM FILTER | It will be active in normal travel and when the doors are open at door zone. This output is used to prevent unnecessary use of EN81-28 emergency phone. |
| 76 | MAX.DIRECTION CHANGE | Max direction change counter has exceeded the value in H12. |
| 77 | GONG | This output is ON while the car has just reached the floor level in normal operation. |
| 78 | ALARM | This output is ON when ALARM button on car operating panel is pressed.<br>This function works only with serial ALYA and BELLA panels as well as in systems with car board PWSC. |

# CHAPTER 7 – PARAMETER DEFINITIONS

All information about lift and control system settings and timings are stored in system parameters. Through G01-MAIN MENU you can reach all parameters for any function. However, **G02-PARAMETERS** menu contains mainly used parameters, inputs and outputs. It is advised to use G01-MAIN MENU only to access advanced functions.

The parameters are classified in following groups:

**P01-GROUP A PARAMETERS**: These parameters are denoted with a prefix letter 'A' as Axx. Main parameters define the type and basic functions of the lift. They can be modified only when the lift is resting.

**P02- GROUP B PARAMETERS:** These parameters are denoted with a prefix letter 'B' as Bxx. Auxiliary parameters define most of the functions of the lift. They can be modified at any time.

**P03-TIMER PARAMETERS:** These parameters are denoted with a prefix letter 'C' as Cxx. Timer parameters store all of the user definable timer settings. They can be modified at any time.

**P04-SPEED PARAMETERS:** This section contains parameters for speed adjustments. They can be modified only when the lift is resting.

**P05-CONTROL PARAMETERS:** Control parameters are mainly the parameters which are used to control the behaviour of the motor. They can be modified only when the lift is resting.

**P06-MOTOR PARAMETERS:** This section has parameters on motor and encoder specifications. They can be modified only when the lift is resting.

**P07-HARDWARE PARAMETERS:** These parameters store the settings for the hardware of the device.

**P08-INPUT DEFINITIONS**: All input terminals can be accessed.

**P09-SPECIAL PARAMETERS:** These parameters store the settings for the special functions of the system.

**P10-OUTPUT DEFINITIONS**: All output terminals can be accessed.

### 7.1 P01-MAIN PARAMETERS

**The lift must be resting to do any modification on main parameters.**

| **[A01] NUMBER OF STOPS** | |
|---|---|
| 2…12 | This parameter stores the number of stops of the lift. |
| **[A02] COMMAND SYSTEM** | |
| 0 | Simple Push Button |
| 1 | Simple Collective |
| 2 | Down Collective |
| 3 | Up Collective |
| 4 | Full Collective |

| | |
|---|---|
| **[A03] MOTOR TYPE** | |
| 0 | Asynchronous Open Loop - Geared machine without encoder |
| 1 | Asynchronous Close Loop - Geared machine with encoder |
| 2 | Synchronous - Gearless machine with absolute encoder |
| **[A04] DOOR TYPE** | |
| 1 | Wing Door (Semi-automatic doors) |
| 2 | Automatic Door |
| **[A05] FLOOR SELECTOR** | *Read section 5.2 for detailed explanation* |
| 0 | Counter Mono-stable Switch |
| 1 | Counter Bi-Stable Switch |
| 2 | Motor Encoder |
| 3 | Shaft Encoder |
| **[A06] DOOR BRIDGING** | |
| 0 | Not Active |
| 1 | Re-levelling |
| 2 | Early Door Open |
| 3 | Relevel + Early Door Open |
| **[A07] GROUP NUMBER** | |
| 0 | Simplex |
| 1 | Duplex |
| **[A09] LANDING COMMUNICATION** | |
| 0 | Car Serial- Landing calls and signals are driven by RBIO board. |
| 1 | Full Serial |
| **[A10] LIFT STANDARD** | |
| 0 | EN81-1 |
| 1 | EN81-1+A3<br>SDB Door Bridging Board must be used if relevelling or early door opening is employed (A06>1). |
| 2 | EN81-20/50<br>SDB Door Bridging Board must be used |
| **[A11] LEVEL DETECTOR** | |
| 0 | <u>MKU/MKD – MKU/MKD switches are used for relevelling start and stop positions.</u><br>This option should be used if motor encoder is used as floor selector [A05=2]. |
| 1 | <u>ENCODER</u><br>Levelling motion is initiated regarding to the current car position. This option should be selected when shaft encoder or absolute encoder is used [A05>2]. |
| **[A12] ENTRANCE FLOOR** | |
| 0…6 | This parameter stores the number of floor(s) below entrance floor if they exist. |

| | |
|---|---|
| **[A13] LIFT/HOMELIFT** | |
| 0 | Normal Lift<br>The lift serves as a normal lift in conformity to the standard EN81-20/50. |
| 1 | Homelift<br>The lift performs as a **homelift.** Traffic system is simple push button. |
| **[A14] FIRE STANDARD**<br>This parameter determines the behaviour of the lift in case of fire. | |
| 0 | EN81-73 Lift<br>Lift **continues to work** after removal of the fire signal. |
| 4 | EN81-73 Lift with blocking after operation<br>Lift stays **blocked** after removal of the fire signal. |
| **[A15] INSTALLATION MODE**<br>This parameter is to facilitate the first installation of the system. System must be inspection mode due to inspection box or RECALL switches to activate this utility. Some of the inputs are inhibited when this utility is active. When the controller returns to the normal mode or system is switched on then this parameter is switched to passive [A15=0] automatically. | |
| 0 | Passive - System works in normal mode. |
| 1 | Active - If the system is in the inspection mode due to RECALL or car top switch, then the controller does not respond 871, DIK, BYP, KRR, DPM, SGO, KL1, KL2, K1C and K2C inputs. Pit inspection, UCM errors and bypass procedures are skipped. |
| 2 | Active - In addition to the selection 1 the states of 817 and 818 switches are ignored. |
| **[A16] UCM CONTROLLER** | |
| 0 | Not Active - No Unintended Car Motion detection is carried out. |
| 1 | Active - Unintended Car Motion system is active. |
| **[A18] PIT CONTROLLER BOARD** | |
| 0 | NOT USED There is no CIO board in shaft-pit. |
| 1 | PRESENT CIO board is used in shaft pit. |
| **[A19] SIMULATOR MODE**<br>Simulator mode can be used to run the integrated device for test and education purpose with a free running motor or without motor. **Do not activate [A19>0] this function in a lift installed in the shaft**. Read section 8.2 for a detailed explanation. | |
| 0 | Not Active - Simulation mode is not active. |
| 1 | Simulator Motor with free running Motor |
| 2 | Simulator Without Motor |
| 3 | Simulator Only Device |
| **[A20] DOOR ZONE** | |
| 150…600 | This parameter stores the door zone length. |
| **[A21] RELEVEL START mm** | |
| 15…30 | Releveling starting point measured from the floor level. Active if [A11=1]. |
| **[A22] RELEVEL STOP mm** | |
| 3..15 | Releveling stopping point measured from the floor level. Active if [A11=1]. |

| [A23] EMERGENCY RESCUE OPERATION ALLOWED | |
|---|---|
| 0 | Passive -Emergency rescue operation is inhibited. |
| 1 | Active |
| **[A24] EKS VOLTAGE**<br>This parameter stores the motor voltage supplied to the device in case of rescue operation. | |
| 0 | 220V AC |
| 1 | 380V AC |
| 2 | 110V AC |
| 3 | 60V DC |
| 4 | 48V DC |
| **[A25] HIGH SPEED SWITCHES (HU/HD)** | |
| 0 | Passive HU/HD are not used. |
| 1 | Active HU/HD are used. |

### 7.2 P02-B PARAMETERS

| [B01] AFTER LOCK FAULT | |
|---|---|
| 0 | <u>Continue</u><br>The system continues its operation after any lock fault. |
| 1 | <u>Block at Repeated</u><br>The system will be blocked after a certain number of repeated lock faults. This number is the value defined in parameter [B05]. |
| 2 | <u>Clear Registers</u><br>All call registers are cleared after any lock fault. |
| 3 | <u>Block + Try Again</u><br>The system will be blocked after a certain number of repeated lock faults. This number is the value set in parameter [B05]. However, the system returns to its normal operation automatically after 5 minutes. |
| **[B02] SKIP SIMPLE ERRORS** | |
| 0 | <u>Stop</u><br>The system stops after all errors. |
| 1 | <u>Continue</u><br>The system continues its operation after some simple errors, which are not related to the safety circuit or car motion. |
| **[B03] ERROR BLOCKING** | |
| 0 | The system will be blocked after error 45, SDB bridge error. |
| 1 | The system will not be blocked after error 45, SDB bridge error |

| | |
|---|---|
| **[B04] UCM ERROR BLOCK**<br>This parameter determines whether the system is going to be blocked after the occurrence of any UCM related errors (Errors with the error number 64, 68, 69 and 72). | |
| 0 | CAN BE BLOCKED<br>UCM Errors will block the lift. |
| 1 | NO BLOCKING<br>UCM Errors will **not** block the lift.<br>**Warning: This option can be used only for installation, repair and maintenance purposes. This parameter cannot be set to 0 for normal operation according to the current lift standards.** |
| **[B05] MAXIMUM ERROR REPEAT** | |
| 3..50 | When any error in the list given below occurs and repeated consecutively as many times as the number defined in this parameter then the system will be blocked.<br>These errors are:<br>6, 7, 12, 13, 21, 23, 27, 28, 30, 38, 40, 41, 42, 43, 44, 61, 62, 63, 65, 66, 67, 70, 71, 73, 74, 75, 82, 88, 89, 90, 91, 92, 116, 119, 120, 121 |
| **[B06] PARK DEFINITION**<br>This parameter determines whether the park floor is present or not and its behaviour at the park floor. | |
| 0 | No Park Floor<br>No park floor is defined. |
| 1 | Park Floor Door Close<br>The car will go to the parking floor set in parameter [B07] when no calls have been received in a specified time period [T02] after the car light goes off. The car will wait at parking floor [B07] with **closed** doors. |
| 2 | Park Floor Door Open<br>The car will go to the parking floor set in parameter [B07] when no calls have been received in a specified time period [T02] after the car light goes off. The car will wait at parking floor [B07] floor with **open** doors.<br>**Warning: This option is not in conformity with EN81-20/50 as well as EN81-1.** |
| **[B07] PARK FLOOR** | |
| 0…63 | This parameter defines the parking floor where the car will go and wait if parking has been activated. |
| **[B08] HALL CALLS INHIBIT**<br>You can inhibit hall calls by using this parameter. | |
| 0 | Hall Calls Allowed |
| 1 | Hall Calls Inhibited |
| **[B09] MAXIMUM CABIN CALLS** | |
| 3…11 | This parameter sets the maximum number of accepted car calls at any time.<br>Any new car calls will not be executed if there are already [B09] car calls. |

| | |
|---|---|
| **[B10] DOOR IN STOP BREAK** | |
| 0 | Door Passive<br>If stop circuit (120) is off at floor level then door signals are passive, neither open nor close commands are applied to the doors. |
| 1 | Door Active<br>Door signals are active after a stop break. |
| **[B12] BASE FLOOR (GROUP LIFT)** | |
| 0…10 | This parameter is used only for group operations.<br>If there are one or more floors of the other lifts in the group below the base floor of this lift, then the number of missing floors downwards must be defined in this parameter. This information is used in adapting the floor levels in group communication. |
| **[B13] DOOR LIMIT SWITCHES** | |
| 0 | Normally Open<br>AL1, KL1 inputs will be active when their terminals connected to 1000. |
| 1 | Normally Closed<br>AL1, KL1 inputs will be active when their terminals are left open. |
| **[B14] FIRE FLOOR 1** | |
| 0…63 | When the input terminal assigned to the input function **FR1** is activated then the car immediately moves to the floor defined in this parameter. |
| **[B15] FIRE FLOOR 2** | |
| 0…63 | When the input terminal assigned to the input function **FR2** is activated then the car immediately moves to the floor defined in this parameter. |
| **[B16] PTC CONTROL** | |
| 0 | PTC Control Off<br>Motor thermistor control is not active. |
| 1 | PTC Control On<br>Motor thermistor control is active. |
| **[B17] PHOTOCELL BYPASS CONTROL** | |
| 0 | Inactive<br>No photocell bypass operation is carried out. |
| 1 | ACTIVE-1 / No Door Close Command<br>Photocell bypass operation is carried out. **Only SLOW CLOSE** output function is activated for door operator to close the door in photocell bypass operation. See also timer parameter [T34]. |
| 2 | ACTIVE-2 / with Door Close Command<br>Photocell bypass operation is carried out. **Door close command** is sent together **with SLOW CLOSE** output function to door operator to close the door in photocell bypass operation. See also timer parameter [T34]. |

| | |
|---|---|
| **[B18] GONG CONTROL**<br>This parameter defines how the arrival gong is executed. | |
| 0 | Gong at Stop<br>Gong signal is activated when the lift stops. |
| 1 | Gong at Slow Speed<br>Gong signal is activated when the lift starts to slow down. |
| 2 | No Car Gong<br>There is no arrival gong. |
| **[B19] MK DELAY** | |
| 0…50 | This parameter is used when floor selector is not encoder [A05<2]. It defines the delay in stopping after the stop magnet switch has been read by the system **in normal operation**. One unit in this parameter corresponds to a time delay of 10 msec. Setting to 0 disables this function.<br>Maximum value 50 corresponds to 0,5 sec. delay. |
| **[B20] ERS MK DELAY** | |
| 0…50 | It defines the delay in stopping after the stop magnet switch has been read by the system **in rescue mode**. One unit in this parameter corresponds to a time delay of 10 msec. Parameter unit is 10 msec. Setting to 0 disables this function. Maximum value of 120 corresponds to 1,2 sec. delay. |
| **[B22] VIP CONTROL** | |
| 0 | Not Active<br>VIP control system is not active. |
| 1 | Active<br>VIP control system is active |
| **[B23] 1st VIP FLOOR** | |
| 0…63 | When the input terminal assigned to VP1 input function is activated then the lift immediately moves to the floor set in this parameter. VP1 has highest priority and VP2 is the next one in VIP system. If VP2 or VP3 is active while VP1 too is active then VP1 is selected and VP2 and VP2 are ignored. |
| **[B24] 2nd VIP FLOOR** | |
| 0…63 | When the input terminal assigned to the VP2 input function is activated then the lift immediately moves to the floor set in this parameter. VP1 has highest priority and VP3 the lowest. If VP2 and VP3 are both active then VP2 is selected and VP3 is ignored. And when VP1 is active V2P is ignored. |
| **[B25] 3th VIP FLOOR** | |
| 0…63 | When the input terminal assigned to the VP3 input function is activated then the lift immediately moves to the floor set in this parameter. VP3 has the lowest priority. Therefore, if VP2 or VP1 are active then VP3 is ignored. |
| **[B26] WAIT DOOR OPEN**<br>This parameter determines how the doors behave at floor level while resting. | |
| 0 | Wait Closed Door<br>Car waits with **closed** doors at floor level. |
| 1 | Wait Open Door<br>Car waits with **open** doors at floor level.<br>**Warning: This option is not in conformity with EN81-20/50 as well as EN81-1.** |

| | |
|---|---|
| **[B27] MR TEMPERATURE**<br>This parameter determines how the machine room temperature information is collected. | |
| 0 | No Temp. Control<br>Machine room temperature will not be carried out. |
| 1 | THR Input<br>An external temperature detector is used in processing machine room temperature. Any active state (ON) in the input terminal assigned to the function THR indicates that the temperature is out of the allowed temperature limits for machine room and therefore any motion is prohibited. |
| **[B28] PANIC FLOOR** | |
| 0…63 | When **panic input** [PNB] has been activated then the lift cancels current calls and travels to the floor defined in this parameter. |
| **[B30] CAR DISPLAY OUTPUT**<br>This parameter defines the digital outputs in car are driven by RBIO board. | |
| 0 | 7 Segment Display |
| 1 | Gray Code Output Digital display outputs of parallel car controller board give Gray Code outputs. Bits are: A: G0, B : G1, C: G2 and D: G3. |
| 2 | Binary Code Output Digital display outputs of parallel car controller give Binary Code output. Bits are: A: B0, B : B1, C: B2 and D: B3. |
| **[B31] HALL DISPLAY OUTPUT**<br>This parameter defines the digital outputs in panel are driven by RBIO board. | |
| 0 | 7 Segment Display<br>Digital outputs are 7 segment display data. |
| 1 | Gray Code Output Digital display outputs RBIO board give Gray Code output. Bits are: A: G0, B : G1, C: G2 and D: G3. |
| 2 | Binary Code Output Digital display outputs on RBIO board give Binary Code output. Bits are: A: B0, B : B1, C: B2 and D: B3. |
| **[B32] CNT CHECKING** | |
| 0 | Checking Off - No contactor checking is carried out.<br>**Warning: This option can be used only for installation, repair and maintenance purposes. This parameter is not allowed to be set 0 for normal operation according to the current lift standards.** |
| 1 | Checking On - Contactor checking is always carried out. |
| **[B34] MENU CHARACTER SET** | |
| 0 | Latin Character Set (Standard)- LCD screen has Latin Characters. |
| 1 | Russian Character Set (Cyrillic) - LCD screen has Cyrillic Characters. |
| **[B35] FLOOR RESETTING** | |
| 0 | Not Activated<br>The lift will not start to travel to reset the counting system after any start-up. |
| 1 | Go Resetting<br>When the lift is switched on then the lift travels the base (or top) floor to reset floor counting system where the floor selector is not absolute encoder, namely [A05<4]. |

| | |
|---|---|
| **[B36] BLOCKING INHIBIT AT SLOW MOTION PERIOD** | |
| 0 | Can Be Blocked<br>Timeout of the timer [T31] Slow Speed Pass Period results in blocking of the system. |
| 1 | No Blocking<br>Timeout of the timer [T31] Slow Speed Pass Period does not in block the system. If [A10=0], then timeout [T05] Floor Pass Period will not block the system, too. |
| **[B37] MOTION IN INSPECTION**<br>This parameter determines the limits of the inspection travel in the shaft limits. | |
| 0 | Stop At 817 / 818<br>The motion in inspection stops upwards at 818 and downwards at 817. Beyond these limit switches no inspection motion is allowed. |
| 1 | To the Last Floor<br>Inspection motion can continue until last floor levels upwards and downwards. |
| **[B38] DOOR OPEN CHECK** | |
| 0 | Check Always<br>Door open check is always carried out when a door open command is executed. |
| 1 | Check Once<br>Door open check is carried out once at the first opening after reaching a new floor. If it is passed, then no check is carried out at this floor anymore. If not passed the system will be blocked. |
| 2 | No Checking<br>No door open check is carried out.<br>**Warning: This option is not in conformity with EN81-20/50.** |
| **[B40] FIRE SWITCH** | |
| 0 | Normally Closed - Fire alarm is activated if the input FRx is passive. |
| 1 | Normally Open - Fire alarm is activated if the input FRx is active. |
| **[B41] DOORS IN FIRE** | |
| 0 | Doors wait open at fire exit floor. (EN81-73) |
| 1 | Doors wait closed at fire exit floor. **(**EN81-73) |
| **[B44] EMERGENCY PHONE BUTTON** | |
| 0 | Emergency phone is activated when INTERCOM BUTTON being pressed for 5 seconds. |
| 1 | Emergency phone is activated when ALARM BUTTON being pressed for 5 seconds. |
| **[B45] CAR CALL CANCELLATION** | |
| 0 | PASSIVE - Car call cancellation system is passive. |
| 1 | ACTIVE - Car call cancellation system is active. Car calls can be cleared by pressing onto the button once more unless this call is not for the target floor. |

| [B47] EXCEEDING MAXIMUM STARTS<br>This parameter determines what the lift will do, when the maximum number of starts given for maintenance control is exceeded. | |
|---|---|
| 0 | ALARM AND WORK |
| 1 | ALARM AND BLOCK |

### 7.3 P03-TIMER PARAMETERS

**In all T type parameters (timings), one unit corresponds to 0.1 sec.**

| **[T01] BUSY PERIOD** | |
|---|---|
| 20…999 | Busy period during which cabin light and Busy output (16) are activated. |
| **[T02] PARK WAIT PERIOD** | |
| 50…9999 | If the parking function has been defined in parameter [B06] (1 or 2) then the lift starts to travel to the parking floor specified in parameter [B07] when no calls have been received after the last travel for the time period specified in this parameter. |
| **[T03] WAIT IN FLOOR** | |
| 31…999 | This parameter defines the time period for the car to wait before departing for the next call in collective systems. |
| **[T04] POWER SAVE DELAY** | |
| 0…6000 | This timer controls the time delay after which the landing displays are switched off when the lift is not in use.<br>Making the value of the parameter zero disables this function. |
| **[T05] FLOOR PASS PERIOD** | |
| 60…3500 | This parameter defines the maximum time interval in which the lift travels from one floor to the next one. If this interval is exceeded an error signal (6) is created. |
| **[T06] OPEN WAIT PERIOD** | |
| 30…999 | After a door-1 open command the door will wait for the period defined in this parameter to close back. |
| **[T07] CONTACTOR WAIT FOR START** | |
| 2…15 | After executing a motion command, the device activates the contactors and waits for the period defined in this parameter for the contacts of the contactors to settle down. At the end of this period, motor driver is enabled. |
| **[T08] BRAKE DELAY AT START** | |
| 2…50 | The brake coils are activated after a time delay when the device has been enabled. This parameter defines this delay. |
| **[T09] ZERO SPEED PERIOD** | |
| 2..50 | Zero Speed period is present only in closed loop systems. As soon as the device has been enabled after a motion command zero speed operation is started to hold the motor shaft stationary. This period starts with [T08] simultaneously. After [T08] period brakes are opened. Therefore [T08] must be smaller than [T09]. |
| **[T10] START SPEED ACCELERATION PERIOD** | |
| 2…50 | When a motion command is received then the speed is increased up to the start speed [S01] in a time period defined in this parameter.<br>This parameter has no effect if [S09] parameter is set to 0. |

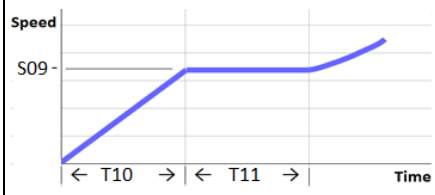
| | |
|---|---|
| **[T11] START SPEED WAIT PERIOD** | |
| 2…50 | This parameter defines how long the driver will hold the car at the starting speed [S01]. At the end of this period, the motor driver starts to accelerate up to its command speed. This parameter has no effect if [S09] parameter is set to 0. |
| **[T12] DC BRAKE PERIOD** | |
| 2…50 | When the speed is lower or equal to the stopping speed [S18] in deceleration phase then either Zero Speed (in closed loop systems) or DC Braking (in open loop systems) is activated to hold the motor stationary. Active DC Braking or Zero Speed period is the sum of [T12] + [T13]. It means that the timer related to this parameter counts down after [T13] period has been diminished. |
| **[T13] BRAKE HOLD DELAY AT STOP** | |
| 3…50 | When the speed is lower or equal to the stopping speed [S18] in deceleration phase the time, period defined in this parameter is initialized and at the end of this period brakes are closed. After this point DC Braking or Zero Speed starts to count down and terminates after [T12] period. |
| **[T14] CONTACTOR DELAY AT STOP** | |
| 2…50 | This timer defines the delay for the contactors to switch off after all operations related to the travel has been completed. |
| **[T15] DTS BUTTON DELAY** | |
| 40…500 | DTS (Door close button) is inhibited during the period defined in this parameter after arrival at the floor. |
| **[T16] RESCUE STARTUP DELAY** | |
| 30…300 | The starting delay of rescue operation after a power failure or phase failure. |
| **[T17] CAM ACTIVATION DELAY** | |
| 2…30 | Time delay to activate door close after the door contact becomes ON in semi-automatic door. |
| **[T18] K20 PERIOD** | |
| 8…500 | When K20 input function is activated then door will open. Then it will wait for the time period specified in this parameter before closing back. |
| **[T19] PHOTOCELL PERIOD** | |
| 20…500 | When FOT input function is activated then door will open. Then it will wait for the time period specified in this parameter before closing back. |
| **[T20] DOOR OPEN PERIOD** | |
| 30…80 | This parameter defines the time period for door to open. The controller checks if the door-1 is open (or more accurately, not closed anymore) within this period after a door-1 open command. |
| **[T21] DOOR CLOSING PERIOD-1** | |
| 0…999 | After a door close command has been executed then the controller waits for a time period defined in this parameter for door-1 to be closed. If door-1 is not closed within this time period then an error (8) will be created. |
| **[T27] DOOR CONTACT TEST** | |
| 6…999 | When KL1 and KL2 inputs become ON and but safety line is not closed after a door close command within the period in this parameter then the system will evoke error (40). The doors are opened. |

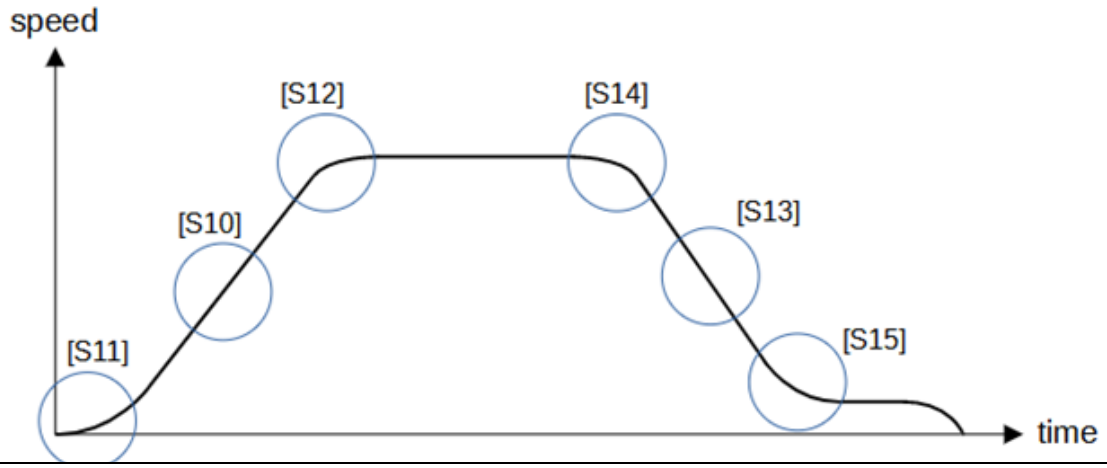
| | |
|---|---|
| **[T29] GRUP DOOR WAIT** | |
| 300…3000 | This parameter is used only for group lifts.<br>If a door will not be closed after a door close command as long as the time in this parameter, then this lift will not work as a group lift anymore. |
| **[T31] SLOW SPEED MAXIMUM PERIOD** | |
| 50…1000 | This parameter stores the maximum period to reach the floor level in slow speed. When this time is over, error (6) is generated and if parameter [B36=0] then system is blocked. [B36=1] prevents blocking after timeout of [T31]. |
| **[T32] ERS DOOR WAIT PERIOD** | |
| 20…300 | This parameter defines the time delay to close the door after arrival at the floor on the rescue mode. |
| **[T33] MAXIMUM BUSY PERIOD** | |
| 0 | Inactive |
| 0…9999 | If the doors are left open or cannot close for a period of [T01] then the busy signal and cabin lights are switched off at the end of this timer [T33]. When a new call is received then lights are activated again, and this function is disabled. |
| **[T34] PHOTOCELL BYPASS PERIOD** | |
| 50…3000 | When FT1 input function is activated continuously for the time period defined in this parameter then door-1 switches to slow close-1 mode and activates slow closing-1 for the door-1 provided that other than 0 is selected in parameter [B17]. |
| **[T36] MAXIMUM RESCUE PERIOD** | |
| 600…5000 | This parameter defines the maximum time period allowed for emergency rescue operation. If the rescue operation is not completed within this period, then it will be terminated by the controller. |
| **[T37] INSPECTION EXIT DELAY** | |
| 30…600 | After inspection the system is switched to Normal mode from inspection then the system waits for the period defined in this parameter to start any travel. |
| **[T38] DIRECTION DELAY** | |
| 40…110 | When the lift arrives at a new floor then its last direction before stopping is kept unchanged within the time interval defined in this parameter. |
| **[T39] LOADING PERIOD** | |
| 0…9999 | When LDB input function (loading button) has been assigned to an input terminal then pressing LDB button holds the doors open within the time period defined in this parameter. The door will not be closed due to a new call. Only DTS and DT2 buttons (door close) can terminate this function. |
| **[T40] ENCODER CONTROL** | |
| 20…99 | When an incremental encoder is used to get car position [A05=2] it is checked by using this timer parameter. If no encoder pulses have been received for a time interval defined in this parameter then an error signal is created (13) and the motion will be stopped. |
| **[T41] PRIORITY PERIOD** | |
| 300…3000 | Priority waiting period. After the lift is called by a priority key and no further call is received for a time period defined in this parameter then the priority operation is cancelled. |

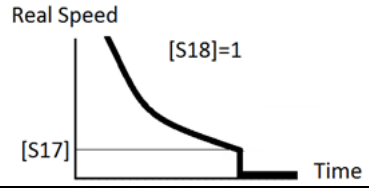
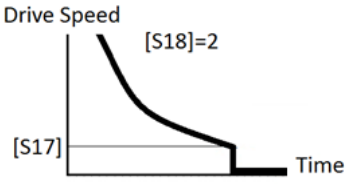
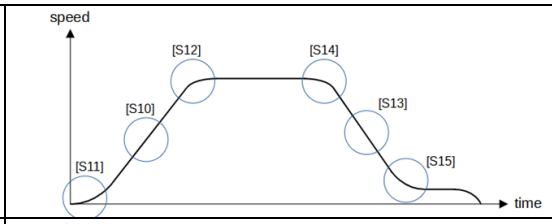
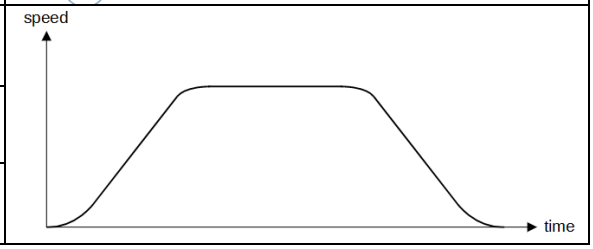
| [T42] CAM DELAY | |
|---|---|
| 0…60 | This parameter is used for semi-automatic doors and defines the activation delay period of retiring cam after the landing door has been closed. |
| **[T43] CAM TIMEOUT** | |
| 30…900 | This parameter is used for retiring cam in semi-automatic doors and defines the timeout period of retiring cam. If 130 signal in safety line does not become ON within the period defined in this parameter after activated, then error 61 will be evoked and CAM will be deactivated. |

### 7.4 P04-SPEED PARAMETERS

| [S01] NOMINAL SPEED (m/s) | |
|---|---|
| 0,01 … 1,6 | Maximum allowed travel speed for normal operation. |
| **[S02] RECALL SPEED (m/s)** | |
| 0,01 … 1,0 | The travel speed used in recall operation. |
| **[S03] RELEVELING SPEED (m/s)** | |
| 0,005 … 0,1 | The travel speed used in releveling. |
| **[S04] INSPECTION NORMAL SPEED (m/s)** | |
| 0,01 … 0,63 | The travel speed in inspection operation where in downwards motion [817=1] and upwards motion [818=1]. |
| **[S05] INSPECTION SLOW SPEED (m/s)** | |
| 0,01 … 0,30 | The travel speed in inspection motion below 817 downwards [817=0] and above 818 upwards [818=0]. |
| **[S06] RESCUE SPEED (m/s)** | |
| 0,01 … 0,50 | The travel speed in rescue operation. |
| **[S07] RESETTING TRAVEL SPEED (m/s)** | |
| 0,05 …. 1,0 | The travel speed used in resetting travel. |
| **[S08] CREEPING SPEED (m/s)** | |
| 0,02 … 0,20 | The travel speed used while approaching the floor. |
| **[S09] STARTING SPEED (m/s)** | |
| 0,0 … 0,10 | If this parameter is zero then the device starts directly from zero.<br>If this parameter is non-zero then the device accelerates in [T10] time period to starting speed [S09] at start. Then it waits for the time period [T11] at the starting speed. Start speed should be used mainly **in open loop applications.** |



| | |
|---|---|
| **ACCELERATION, DECELERATION AND S-CURVES**<br>The parameters S10…S15 and S22 are only accessible if [S23=0] otherwise they are automatically set regarding to the value of S23. | |
|  | |
| **[S10] ACCELERATION (m/s²)** | |
| 0,1…5,0 | Acceleration value of the system.<br>Increasing the value makes the lift reach to the target speed in shorter time. |
| **[S11] S-CURVE IN ACCELERATION START (m/s³)** | |
| 0,1…3,0 | Increase in acceleration in the S-Curve at the beginning of acceleration.<br>A lower value results in a softer start. |
| **[S12] S-CURVE IN ACCELERATION END(m/s³)** | |
| 0,1…3,0 | Decrease in acceleration in the S-Curve at the end of acceleration.<br>A lower value results in a softer transition at the end of the acceleration path. |
| **[S13] DECELARATION (m/s²)** | |
| 0,1…3,0 | This parameter defines the deceleration rate. Higher value shortens the slow down path. Lower value increases slow down path and comfort. |
| **[S14] S CURVE IN DECELARATION START (m/s³)** | |
| 0,1…3,0 | Increase in deceleration in the S-Curve at the beginning of deceleration.<br>A lower value results in a softer transition to slow down path. |
| **[S15] S CURVE IN DECELARATION END (m/s³)** | |
| 0,1 …3,0 | S-Curve at the end of deceleration.<br>A lower value results in a softer transition to stopping. |
| **[S16] STOPPING METHOD** | |
| 0 | Stop mode for **synchronous motor.** |
| 1 | Stop mode for **asynchronous motor.** |
| 2 | Faster stop mode for synchronous motor. |
| 3 | Faster stop mode for asynchronous motor. |
| 4 | Declining torque |
| **[S17] STOP SPEED (m/s)** | |
| 0,0 … 0,1 | When the speed is below the value defined in this parameter during a travel while the car is approaching the floor in slow down phase then the device accepts this as stop command. You should also define the method for detecting stop speed in parameter [S18] properly. |

| | | |
|---|---|---|
| **[S18] STOP SPEED REFERENCE** | | |
| 0 | <u>Real Speed</u><br>Reference speed read by the encoder.<br>Recommended for closed loop applications. |  |
| 1 | <u>Drive Speed</u><br>Reference speed is the speed calculated by the device.<br>Recommended for open loop applications. |  |
| **[S19] START MODE**<br>This parameter is used to prevent any rollback of the car in starting for synchronous motors. See section 8.1 for detailed explanation. | | |
| 0 | Passive | |
| 1 | Anti-Rollback - Smart | |
| 2 | Anti-Rollback - Fast | |
| 3 | Anti-Rollback - Fast+Smart | |
| 4 | <u>Pre-Torque -</u> Digital weight transducer feedback is optional. | |
| 5 | <u>Pre-Torque – Analog</u> - Analog weight transducer feedback is required<u>.</u> | |
| **[S20] STOPPING DECELERATION** | | |
| 0,1 … 5,0 | This parameter defines the deceleration rate when the car gets stop command while travelling at creeping speed. | |
| **[S21] STOPPING DECELERATION START S-CURVE** | | |
| 0,01 … 5,0 | This parameter defines S-curve rate to reach the deceleration in [S20], when the car gets stop command while travelling at creeping speed. | |
| **[S22] CREEPING PATH** | | |
| 0 … 500 | This parameter defines the travel path in creeping speed. Unit is mm. | |
| **[S23] TRAVEL CURVE** | | |
| 0 | Free access to speed curve parameters S10…S15 and S22.<br>Deceleration with creep speed. |  |
| 1 | Direct Landing system – Slow |  |
| 2 | Direct Landing system - Medium | |
| 3 | Direct Landing system - Fast | |

### 7.5- P05 CONTROL PARAMETER

Control parameters are mainly the parameters which are used to control the behaviour of the motor.

| **[C01] CARRIER FREQUENCY** | |
|---|---|
| Carrier frequency defines the time period during which the basic calculations of speed are carried out. Preferred values are 8-10 kHz for most of the application. However, some motors may become noisy in some carrier frequencies. | |
| 6…16 | Carrier frequency [kHz] |
| **[C02] - ENCODER FILTER** | |
| This parameter defines the time period of reading encoder data. Making this period shorter results in a faster response to any speed deviation. However, a faster response may create some vibrations in speed. Set this parameter lower than 3 if ppr (pulse per revolution) value of encoder is less than 500. | |
| 0 | 1 ms |
| 1 | 2 ms (Preferred for synchronous motor) |
| 2 | 4 ms (Preferred for asynchronous motor) |
| 3 | 8 ms |
| 4 | 16 ms |

**PID Control**

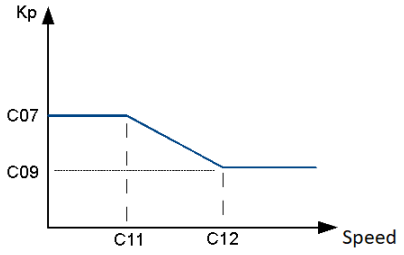
AE-SMART is a vector-controlled lift motor driver. It calculates required data carrier frequency times and assigns voltage and frequency of motor signals. Device receives motor speed via encoder of motor. If the reference speed differs from the motor speed, device makes calculations to reset this difference. PID control contains the definitions of the adjustment procedure.

| **Zero Speed PD Control** | |
|---|---|
| Zero speed process is used to overcome slip of the machine when mechanical brakes opened at start-up. | |
| **[C03] – ZERO SPEED Kp** | |
| 1,0…200 | Kp coefficient in zero speed control. |
| **[C04] - ZERO SPEED Kd** | |
| 0…200 | Kd coefficient in zero speed control. |

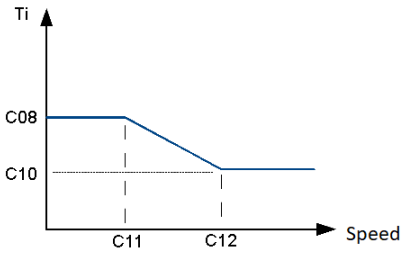
| **Start Speed PI Control** | |
|---|---|
| When reference speed is lower than the value defined in [S09] Start Speed parameter then C05 and C06 are used as PI parameters. | |
| **[C05] – START SPEED Kp** | |
| 0.1…100.0 | Kp coefficient on PID process |
| **[C06] – START SPEED Ti** | |
| 0 … 9999 | Ti (1/Ki) coefficient on PID process when reference speed is lower than Start Speed [S09] parameter. |

**Motion PI Control**

When reference speed is higher than start speed, then Kp and Ti parameters are selected from [C07]-[C12] parameters according to reference speed. [C07] and [C08] are used where the reference speed is lower than [C11] PI Low Speed; [C09] and [C10] is used where the reference speed is higher than [C12] PI High Speed. Kp and Ti parameters change linearly between [C11] and [C12] reference speeds.



Change in Kp

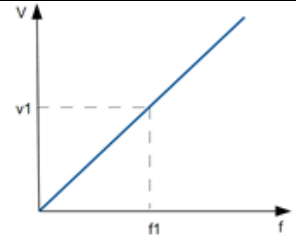


Change in Ti

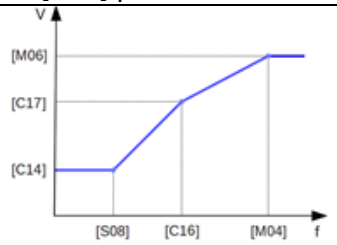
| **[C07] – LOW SPEED Kp** | |
|---|---|
| 0.1…100.0 | Kp coefficient when system speed is lower than [C11] parameter. |
| **[C08] – LOW SPEED Ti** | |
| 0.0 … .9999 | Ti coefficient when system speed is lower than [C11] parameter. |
| **[C09] - HIGH SPEED Kp** | |
| 0.1…100.0 | Proportional gain coefficient, Kp when the system speed is higher than [C12]. |
| **[C10] – HIGH SPEED Ti** | |
| 0.0…9999 | İnverse of the integral gain coefficient Ti, when the system speed is higher than [C12]. |
| **[C11] - LOW SPEED PI** | |
| 0.0 ... 1.0 | C11 sets the lower transition speed for PID coefficients Kp and Ti. |
| **[C12] - HIGH SPEED PI** | |
| 0.0 ... 1.0 | C12 sets the upper transition speed for PID coefficients Kp and Ti. |
| **[C13] - CURRENT Kp** | |
| 0.1…9.9 | Proportional gain Kp coefficient of the current PID loop. |
| **[C14] - CURRENT Ti** | |
| 0.0….9999 | Ti, inverse of the integral coefficient of the current PID loop. |

**Open Loop Control**

Open Loop can be used with synchronous motors below 1m/s and for low load capacity lift operations. Open loop control uses voltage/frequency (V/f) curve. As seen on the Figure all frequencies have different voltage values. Increase on frequency increases drive voltage. However, on low frequencies, system cannot drive a motor because of the low voltage values. Adjust low frequency settings with [C16] and [C17] parameters.



Open Loop Linear V/f Curve



Open Loop Real V/f Curve

| | |
|---|---|
| **[C15] - DC BRAKE LEVEL (%)** | |
| 5.0 …100.0 | This is a parameter used only for open loop applications.<br>[C15] defines the DC brake level at start-up and stopping. In DC braking the motor is held stable until the inverter starts to rotate the motor at starting and until the mechanical brake is released at stopping. A high value may warm up the motor. If the value is lower than required, then motor slips at start and stopping. |
| **[C16] - V/F STARTING SPEED** | |
| 0.1 …1.0 | This is a parameter used only for open loop applications.<br>In V/f mode, system cannot start up with linear curve due to the static load. Instead of this inverter drives motor with a constant voltage below a frequency point. [C16] parameter is the start point of V/f curve. |
| **[C17] - V/F STARTING TORQUE** | |
| 0,1…1 | This is a parameter used only for open loop applications.<br>Minimum torque level when system speed is under [C16]-V/f Low Speed at starting and stopping phases. If it is greater than required, then motor may vibrate. If the value is smaller, then the device cannot drive motor smoothly at low speeds. |
| **[C18] - TORQUE Kp** | |
| 0.1…9.9 | Kp coefficient of torque feedback. |
| **[C19] - TORQUE Ti** | |
| 0.0…9999 | Ti coefficient of torque feedback. |
| **[C20] - TUNING CURRENT (%)** | |
| 0.0…100.0 | The percentage of the nominal motor current that will be applied to the synchronous motor in tuning process.<br>If motor tuning is not successful then increase [C20]. |
| **[C21] – FIELD WEAKENING**<br>If motor is driven above its nominal speed, magnetizing current has to be decreased. This process is called Field Weakening. [C21] parameter determines whether field weakening is active or inactive. | |
| 0 | Passive - No field weakening. Magnetizing current will not be decreased. (Motor may not reach set speed) |
| 1 | Active 1 - Field weakening is activated. (Method 1) |
| 2 | Active 2 - Field weakening is activated. (Method 2) |
| **[C23] - PULSE/mm** | |
| 0.1…1000 | This parameter stores the corresponding number of encoder pulses for 1 mm travel of the car. This parameter is set automatically in shaft learning process. |

### 7.6 P06 MOTOR PARAMETERS

| | |
|---|---|
| **[M01] - ENCODER PULSE** | |
| 100…5000 | Pulse value of encoder. Get this information from encoder label. |
| **[M02] - MOTOR SPEED** | |
| 0,1…1,6 | Nominal speed of motor. Get this information from motor label. |

| | |
|---|---|
| **[M03]- MOTOR RPM VALUE** | |
| 10…3000 | RPM value of motor. Get this information from motor label. |
| **[M04] - MOTOR FREQUENCY** | |
| 5…250 | Nominal frequency of motor. Get this information from motor label. |
| **[M05]- MOTOR CURRENT** | |
| 1…60 | Nominal current of motor. Get this information from motor label. |
| **[M06] - MOTOR VOLTAGE** | |
| 100…450 | Nominal voltage of motor. Get this information from motor label. |
| **[M07] - MOTOR COS VALUE** | |
| 0,1…1 | Cos value of motor. Get this information from motor label. |
| **[M08] – NUMBER OF MOTOR POLES** | |
| 2…200 | Number of poles of motor. Get this information from motor label. |
| **[M09] - MOTOR NOLOAD CURRENT (%)** | |
| 5 … 100 | Ratio of motor no-load current and motor nominal current. If the value is high, motor might use more current, otherwise if the value is low then motor start-up might be noisy or it cannot start-up.<br>This parameter has no effect in synchronous motors (gearless machines). |
| **[M10] – STATTOR RESISTANCE (ohm)** | |
| 0,1…10 | Resistance value of stator. Automatically set by tuning process. |
| **[M11] – RESIDUAL INDUCTANCE (mH)** | |
| 10…3000 | Inductance value of stator. Automatically set by tuning process. |
| **[M12] – ROTOR RESISTANCE (ohm)** | |
| 0,1…10 | Resistance value of rotor. Automatically set by tuning process. |
| **[M13] – MAGNETISING INDUCTANCE (mH)** | |
| 10…3000 | Mutual inductance value of motor. Automatically set by tuning process. |
| **[M14] – ROTOR TIME CONSTANT (ms)** | |
| 10…3000 | Rotor time constant of motor. Automatically set by tuning process. This parameter has no effect in synchronous motors (gearless machines). |
| **[M15] - ENCODER OFFSET** | |
| 0…359.99 | Encoder offset in synchronous motor. Automatically set by tuning process. |

**[M16] - ENCODER TYPE**

This parameter defines the encoder type used in the inverter. An asynchronous motor uses INCREMENTAL encoder where an asynchronous motor needs an absolute encoder listed between 1...7.

| | | | |
|---|---|---|---|
| 0 | INCREMENTAL | 4 | SSI (Gray) |
| 1 | ENDAT | 5 | ENDAT-SPI |
| 2 | SINCOS | 6 | BISS-BIN (Binary) |
| 3 | BISS (Gray) | 7 | SSI-BIN (Binary) |

**[M17] - ENCODER DIRECTION**

This parameter interchanges encoder channels. Change this parameter only if there is an encoder direction fault at installation, otherwise check encoder and connections.

| | |
|---|---|
| 1 | CLOCKWISE |
| 2 | COUNTER CLOCKWISE |

| [M18] - TUNING MODE | |
|---|---|
| 0 | Stationary Tuning<br>Tuning process is carried out while motor is held stationary. Motor brakes must be held closed to prevent any rotation. |
| 1 | Rotating Tuning<br>Tuning process is carried on with motor rotation. Brakes must be opened to allow rotation. |
| **[M19] – MOTOR DIRECTION**<br>This parameter determines the rotation direction of the motor. After tuning process, if the car moves upwards for a down command or vice versa then change the value of this parameter. | |
| 1 | Direction 1 |
| 2 | Direction 2 |
| **[M20] – CAR DIRECTION**<br>This parameter determines the count direction of the car when motor encoder is used as floor selector [A05=2]. After installation process, if the floor position is counted reversely then change the value of this parameter. | |
| 1 | Direction 1 |
| 2 | Direction 2 |

### 7.7 P07 HARDWARE PARAMETERS

| [E01] – LANGUAGE<br>The screen language of LCD screen is set by this parameter. | | | |
|---|---|---|---|
| 0 | Turkish | 4 | Russian |
| 1 | English | 5 | Spanish |
| 2 | German | 6 | Greek |
| 3 | French | 7 | Italian |
| **[E02] – BUTTON PRESSED CONTROL**<br>This parameter enables or inhibits checking of faulty button. | | | |
| 0 | PASSIVE<br>No faulty button is checked. | | |
| 1 | ACTIVE<br>If a landing button remains pressed for 5 minutes then the system creates an error. This button is not read any more and the lift can function normally. When the system is switched off or entered into inspection mode then disregarding the button is terminated. Note that this function can be used **only in car serial connection.** | | |
| **[E04] – LANDING ARROWS**<br>This parameter determines the information indicated by landing arrow. | | | |
| 0 | Motion Direction - Landing arrows indicate motion direction. | | |
| 1 | Service Direction - Landing arrows indicate next direction. | | |

| | |
|---|---|
| **[E05] - SERIAL CHANNEL 1**<br>This parameter determines for which purpose serial port 1 SP1 is going to be used. | |
| 0 | FREE - Not used. |
| 1 | PC COMMUNICATION<br>It is used to transfer data to a PC via Ethernet or USB interface. |
| 2 | GSM - A GSM system is connected to SP1. |
| **[E07] - CAR CAN CHANNEL**. | |
| 0 | CAN 0 |
| **[E08] - LANDING CAN CHANNEL**<br>E08 defines the interface channel for landing panels. | |
| 0 | CAN 0 |
| 1 | CAN 1 |
| 2 | CAN 2 |
| 3 | NOT ACTIVE |
| **[E09] - GROUP CAN CHANNEL** | |
| 2 | CAN 2 |
| 3 | NOT ACTIVE |
| **[E10] - ENCODER CAN CHANNEL**<br>A10 defines the interface channel for absolute CAN encoder. | |
| 0 | CAN 0 |
| 3 | NOT ACTIVE |
| **[E13] - LCD BACKLIGHT**<br>This parameter determines the activation of LCD backlight. | |
| 0 | AUTO OFF |
| 1 | ALWAYS ON |
| 2 | ALWAYS OFF |

### 7.8 P08-SPECIAL PARAMETERS

| | |
|---|---|
| **[U01] - TEMPERATURE LIMIT** | |
| 55-85 | Temperature limit of the system. If device temperature exceeds this limit, it stops working until the temperature decreases below the limit. |
| **[U02] - CURRENT COEFFICIENT** | |
| 0.1-5.0 | The system uses this coefficient in current sense function. |
| **[U03] – DYNAMIC BRAKE START** | |
| 350-770 | If DC-Bus voltage exceeds the voltage defined in this parameter, then dynamic braking is started.<br>The device lowers DC-Bus voltage level by sending current to the braking resistor. |
| **[U04] – DYNAMIC BRAKE END** | |
| 345-765 | Dynamic braking is terminated, if dc-bus voltage gets down under the voltage defined in this parameter. |
| **[U05] – DYNAMIC BRAKE PERIOD** | |
| 0-6 | Frequency of dynamic braking operation. |

| | |
|---|---|
| **[U06] – MAXIMUM OUTPUT FREQUENCY**<br>This parameter defines the maximum output frequency of motor driver. | |
| 0 | 100Hz - Motor Frequency is less than or equal to 100 Hz. |
| 1 | 250Hz - Motor Frequency above 100 Hz. |
| **[U07] – LINE VOLTAGE** | |
| 0 | Line Voltage is 3x400V |
| 1 | Line Voltage is 3x200V |
| 2 | Line Voltage is 1x220V/230V |
| **[U08] – PRE-TORQUE Kp** | |
| 1-100 | The value in this parameter determines the magnitude of the torque applied in pre-torque operation. Increasing value increases the torque. |
| **[U09] – PRE-TORQUE PULSE** | |
| 2-50 | The value in this parameter determines after how many pulses of rollback, pre-torque operation will be activated. |
| **[U10] – PRE-TORQUE SPEED** | |
| 0.0 – 0.1 | The value in this parameter determines after reaching which speed of rollback, pre-torque operation will be activated. |
| **[U11] – PRE-TORQUE PERIOD** | |
| 1-500 | The value in this parameter determines Ti period in pre-torque operation. Decreasing Ti will increase pre-torque power. |
| **[U12] – SPEED FILTER** | |
| 1-20 | Low pass filter of the system speed feedback. |

# CHAPTER 8 – ADVANCED APPLICATION AND SPECIAL FUNCTIONS

## 8.1 PRE-TORQUE AND ANTI-ROLLBACK

The behaviour in starting is controlled by the parameter **S19**. This parameter determines the use of additional functions in zero speed process. If [S19=0] then no additional control is carried out during zero speed control. There are two main control systems for rollback control:

### 8.1.1 Anti-rollback control

In this method the slip of the car is observed and a torque in reverse direction is applied to the motor to prevent rollback. No load feedback is used. Here are related options:

| Value of [S19] | Control Method |
|---|---|
| 1 | Anti-Rollback - Smart<br>If a slip in travel direction is detected during zero speed operation, then zero speed operation is terminated, and acceleration will start. |
| 2 | Anti-Rollback - Fast<br>Encoder reading period is shortened internally to speed up the response time to any slip in any direction. |
| 3 | Anti-Rollback - Fast+Smart<br>Both control methods in 1 and 2 are involved simultaneously. The response time to any movement gets faster as well as the inverter switches directly to the acceleration curve when any rollback in travel direction is detected. |

### 8.1.2 Pre-torque control for synchronous motor

For pre-torque application a feedback loop with a weight transducer is optional. It is usually an electronic overload device. First read and follow the instructions in the installation manual **AE-SMART PRE-TORQUE SENSOR MANUAL** to install the system for pre-torque.

#### 8.1.2.1 Pre-Torque (Digital feedback is optional)

| Value of [S19] | Control Method |
|---|---|
| 4 | Pre-Torque<br>Zero speed control is performed with pre-torque. Feedback coming from the digital outputs of the load sensor of cabin is optional and decreases the rollback motion. |

For digital feedback of weight transducer connection, there are three digital inputs as **LS1, LS2** and **LS3.** They can be connected to the digital outputs of the weight transducer device. The output of the weight transducer device should be adjusted to output the digital outputs as shown below.

Table 8.1

| **x% : Cabin Load at starting / Nominal Load of the car**<br>CL: Cabin Load at starting | **LS1**<br>**%25** | **LS2**<br>**%50** | **LS3**<br>**%75** |
|---|---|---|---|
| **CL** < 25% | 0 | 0 | 0 |
| 25% <= **CL** < 50% | 1 | 0 | 0 |
| 50% <= **CL** < 75% | 1 | 1 | 0 |
| **CL** > 75% | 1 | 1 | 1 |

- If 3 outputs are used, then define and set **LS1, LS2** and **LS3** as **25%, 50% and 75% loads**, respectively.
- If 2 outputs are used, then define and set **LS1 as 30% and LS2 as 60% loads**.
- If only one output is used, then define and set **LS1 as 50% load**.

System estimates and applies the required pre-torque to prevent rollback for the instantaneous cabin load by using the information in Table 8.1. This method works also without feedback. Of course, since there is only three bits feedback information no perfect result can be achieved.

- If rollback still presents, go to **P09-SPECIAL PARAMETERS** menu and adjust parameters **U08, U09, U10** and **U11** to get a better result.
- The functions of these parameters are described below.
- If no rollback but jerk is present, then decrease U08.
- Please be aware of that the configuration that gives best comfort **may vary depending on the motor type and application**. **You may need some trials**.

| PARAMETERS USED IN PRE-TORK OPERATION | | | Used For |
|---|---|---|---|
| U08 | PRE TORQUE KP | It determines the gain in this process.<br>Increasing value makes pre-torque stronger. | S19 = 5<br>S19 = 4 |
| U09 | PRE TORQUE PULSE | This parameter determines after how many pulses of rollback will the system start to apply pre-torque. | S19 = 5<br>S19 = 4 |
| U10 | PRE TORQUE STARTING SPEED | This parameter determines after which rollback speed will the system start to apply pre-torque. | S19 = 5<br>S19 = 4 |
| U11 | PRE TORQUE PERIOD | It determines Ti interval of the process.<br>Decreasing this parameter makes pre-torque stronger | S19 = 5<br>S19 = 4 |

#### 8.1.2.2 Pre-Torque-Analog

| Value of [S19] | Control Method |
|---|---|
| 5 | Pre-Torque-Analog<br>Zero speed control is performed with pre-torque by using the feedback coming from the analog output of the weight transducer of cabin. |

By using this method, the best control of the starting can be achieved. However, an analog voltage output proportional to the load inside the cabin is required to implement this process. System will estimate and apply the required torque to hold the car stable by using the analog signal as feedback.

In this application system learns the torque required for each new load and saves them for further use. Therefore, after installation you will feel some rollback or jerks for a while. But, after some number of starts with various loads, load versus torque data will be filled and there will be no jerk or slip in starting. In case you need to clear this table, such as when you have replaced a device from another lift, you can use the application in services **G08-SERVICES-> 6-CLEAR LOAD DATA.** You can adjust the system response by means of Special Parameters U08…U11 as described in previous section 8.1.2.1.

### 8.2 SIMULATION MODE

It is possible to run the device in simulation mode. Simulation can be performed for test, demo or education purposes where the device can run with or without motor connected. **Simulation operation is not allowed when the controller has been connected to the lift motor in the shaft or machine room.**

In simulation mode all functions are performed normally except shaft switches and encoder pulses. They are simulated by the device. Therefore, ML1, ML2, MKD, MKU, 817, 818 switches and encoder are not read. You can leave them unconnected in simulator operation.
Besides this, some errors are inhibited. You can simulate motion simply by giving calls. The virtual car will move and open its doors at arrival at the target floor.
Safety line must be connected.
Door contacts can be simulated by output relays driven by the door open/close signals. This is necessary when no door is connected to the controller.

| [A19] SIMULATOR MODE | |
|---|---|
| 0 | Not Active<br>Simulation mode is not active. |
| 1 | Simulator Motor with free running Motor<br>In this mode the device runs the motor. Everything besides the inputs listed above must be connected. |
| 2 | Simulator Without Motor<br>In this mode the device runs without motor. You should leave motor connections. The errors related to the motor operation and motor cabling will be ignored. |
| 3 | Simulator Only Device<br>In this mode the device runs without motor and any other external board. No connection to motor as well as car and shaft boards are required. The errors related to the motor operation, motor cabling as well as shaft communication will be ignored. |

**The procedure is as follows:**

1- Set parameter [A19] for desired Simulator Mode as explained above [A19>0].
2- Adjust one input as SIM (62) and activate SIM input by connecting it to terminal 1000.
3- Set floor selector parameter as motor encoder [A05=2].
4- Execute **CLEAR ENCODER DATA** service routine.
5- If there is no door used in simulation process then adjust two output relays as DOOR CLOSE (output function 58). If door controller board is used you need only one.
6- Connect safety line through door contacts in the way depending on the door type or through the output relay defined in item 5 above.
7- Connect KL1 input through other output relay to terminal 1000.
8- Items 5,6, and 7 are for a system with one door. Duplicate them for the second door if there is one.

# CHAPTER 9 – ERROR LOG AND ERROR CODES

In AE-SMART Control Systems, all determined errors are reported at runtime on main screen and stored in permanent memory. Error storing capacity of system is limited to 250. If an error occurs when there are 250 errors stored in memory, then oldest error is cleared and the new one is stored. You can see last 250 stored errors anytime by using screen or from your computer connection.

## 9.1 ERROR CODES

| CODE | ERROR | EXPLANATION |
|---|---|---|
| **1** | **Stop Circuit Open** | Stop circuit-120 (Speed regulator, parachute contact, stop buttons…) is open. |
| **2** | **125-135 Circuit is Open** | Door Contact circuit 125-130 is open during motion. |
| **3** | **140 Circuit is open** | Door Lock circuit-140 is open during motion. |
| **6** | **Pass Time Overflow** | 1-At fast speed, system cannot not get new floor data within the time period defined at [T05].<br>2-At slow speed, system could not reach floor level within the time period defined at [T31]. |
| **7** | **Door Cannot Open** | After any door open command door contacts are not open within the period defined at [T20] for door A or [T25] for door B. |
| **8** | **Door Not Closed** | After transmitting any door close command, the door is not closed.<br>[KL1=0] for door A, [KL2=0] for door B within the time period defined in [T21] for door A or [T26] for door B. |
| **9** | **817 - 818 Are Open** | Up and down limit inputs [817=0] and [818=0] are both open simultaneously. |
| **10** | **Floor Number is wrong** | The floor number obtained from the floor selector system is not correct. |
| **11** | **Counter Error** | Inconsistency in floor number on displays and car position. This error arises if the floor number is not 0 when the car is at bottom floor [817=0] and [818=1] or floor number is not top floor when the car is at top floor [817=1] and [818=0]. |
| **12** | **Encoder Direction Error** | Encoder rotation direction is not the same as the car travel direction.<br>Interchange A and B channels of the encoder connection. |
| **13** | **No Encoder Signal** | No encoder signal is received from encoder while the car is moving within the time period defined [T40]. Check electrical connections of encoder circuit as well as the mechanical coupling of the encoder. |
| **14** | **Bypass Error** | If the bypass input is open [BYP=0] and the lift is in normal mode then this error arises. Bypass switch must be normally closed. |
| **15** | **Park Floor Definition** | Defined park floor parameter in [B07] is above the maximum number of stops defined in [A01]. |
| **16** | **Fire Floor Definition** | Defined fire floor parameter in [B05] is above the maximum number of stops defined in [A01]. |

| CODE | ERROR | EXPLANATION |
|---|---|---|
| **17** | **U2 Communication Error** | Internal communication problem between electronic boards inside the device. Switch off the device. If the problem persists then consult the technical service. |
| **18** | **No Car Communication** | System cannot communicate with car units. Check serial communication states of the main board and the car controller. If BE or LEDs on CAN drivers are ON then there is something wrong either in electrical wiring of CAN units or in values of the termination resistors. Check also parameter [E07]. It defines the CAN-channel used for car circuit. You should connect car communication cables to the CAN-port denoted in [A18] |
| **19** | **MCI Short Circuit** | Internal error |
| **20** | **NO PTC/Thermistor** | Motor is overheated or PTC circuit is not connected [PTC=0]. |
| **21** | **Floor Pulse Error** | Current car position is inconsistent. |
| **22** | **Door Motor Hot** | Automatic door motor is overheated or DTP input is open [DTP=0]. |
| **23** | **Number of Relevels** | Releveling has been started 20 times but cannot be completed properly. |
| **24** | **No Shaft Learn** | If floor selector is incremental or absolute encoder then you need execute shaft learning procedure at least once. If this has not been done you will get this message. |
| **25** | **Encoder Data Error** | Floor Pulse data is missing or faulty. Shaft learning should be carried out. |
| **26** | **Machine Room Temperature** | If [B27=1] then checking MR temperature is carried out by an external measuring device. The controller reads its output through the terminal input [THR]. Check if THR input is connected to the external device and the adjustment of the external device. |
| **27** | **MC is not ON** | MC contactor is not ON.<br>MCI input must be used when system is used not in STO mode but with serial contactors at the output. This error is arised when MC contactor is ON but MCI input is still active. |
| **28** | **MC is OFF during travel** | MC contactor is OFF during motion. |
| **29** | **Contactor Failure** | Although there are no contactors activated, there is no signal in CNT terminal. Check CNT wiring and definition. Check also the wiring of the CNT circuit through normally closed aux-contacts of the contactors. |
| **31** | **Low Voltage** | DC Bus voltage of the motor driver is low. |
| **32** | **High Voltage** | DC Bus voltage of the motor driver is high**.** |
| **33** | **ML2 Open at Floor** | If ML2 switch becomes passive [ML2=0] while the car is staying at floor level this error is created. If the doors are open then it is an UCM error and the system is blocked. Check the magnet and switch locations of ML1 and ML2. |
| **34** | **ML2 Short Circuit** | This error is reported if ML2 switch is still on [ML2=1] when the car has left the door zone. Check the switches, magnets, inputs and wiring related to ML1 and ML2. |
| **35** | **Phase L1/R Missing** | L1/R phase is not present. Check line phases. |

| CODE | ERROR | EXPLANATION |
|---|---|---|
| **36** | **Phase L2/S Missing** | L2/S phase is not present. Check line phases. |
| **37** | **Phase L3/T Missing** | L3/T phase is not present. Check line phases. |
| **38** | **Switching Error** | There is voltage on DC Bus although input relays are not switched on. |
| **39** | **SPI Error** | There is communication fault between internal microprocessors. |
| **40** | **Door Contact Failure** | Despite doors being physically closed, door contact is not closed. The physical state of the door is controlled by KL1 and KL2 inputs. |
| **41** | **Levelling Period** | If levelling job cannot be completed within the time period defined in the system (10 sec) this error is created. |
| **44** | **KL1 OFF** | According to EN81-20/50 car doors must be physically closed in bypass mode in any inspection travel. KL1 input on car door is used to check this. If any door contact KL1 is open in inspection travel in bypass mode this error is created. |
| **45** | **SDB Bridging Error** | This error is reported if SDB board cannot bridge safety line after activated. Check 140, ML1, ML2 inputs, ML1 and ML2 switches and related magnets. |
| **47** | **Resetting Inhibited** | Resetting car position after re-start has been inhibited by parameter [B35]. This is a warning message, not fault. |
| **48** | **ERS Battery Error** | Voltage level of the battery of the emergency power supply is low. |
| **49** | **ERS Door Not Open** | After the rescue operation has been completed the doors are opened. If the doors cannot be opened within the time period [T32]. Check door supply voltage and door control signals |
| **50** | **ERS Door Not Closed** | If in rescue operation the door cannot be closed within the time period determined by timer [T32] then this error is created. Check door supply voltage, door contacts and door control signals |
| **52** | **ERS Maximum Period** | If the emergency rescue operation takes a longer than the period stored in timer parameter [T36] this error is reported. |
| **53** | **ML1 Open at Floor** | If ML1 switch becomes open [ML1=0] while the car is staying at floor level this error is created. If the doors are open then it is an UCM error and the system is blocked. Check the magnet and switch locations of ML1 and ML2. |
| **54** | **ML1 Short Circuit** | This error is reported if ML1 switch is still closed [ML1=1] when the car has left the door zone. Check the switches, magnets, inputs and wiring related to ML1 and ML2. |
| **56** | **Fire Reset** | If the parameter [A14=4] then this message is displayed when all fire inputs have been returned to their normal positions. System will wait as blocked until switching to inspection mode or a re-start. |

| CODE | ERROR | EXPLANATION |
|---|---|---|
| **57** | **Call Button Error** | If a hall button stays more than 300 seconds pressed then the system reads it no more, set as faulty and display this message. Entering into inspection mode clear this message. This facility can be activated or inhibited through adjusting parameter [E02]. This facility is available only in parallel landing buttons. |
| **58** | **Earthquake** | Earthquake signal is received [EQK=0] due to a low signal at EQK input. The system will switch into earthquake mode. |
| **59** | **Bottom Final Stop** | The car has exceeded bottom final stop downwards. |
| **60** | **Top Final Stop** | The car has exceeded top final stop upwards. |
| **61** | **Retiring Cam Period** | Door contacts are not closed (125-130) within the defined time period after the retiring cam has been energized. Check door contacts, the activation process and definition of the retiring cam. |
| **62** | **Pit Board Communication Error** | If there is a pit controller [A18=1] then the controller communicates with it. If no communication is established with pit controller board then this error is created. Check CAN shaft connections and [E08] parameters. Please note that pit board communicates via shaft CAN channel. |
| **63** | **Brakes are closed** | This error is created if the brakes of a gearless machine are closed during motion. |
| **64** | **Brake Not Closed** | Although the brake coils have not been energized, no signal is received from brake feedback contacts. Check BR1, BR2 terminals, contacts, definitions and related wiring. This error is reported only if [A16=1]. |
| **65** | **Brake Not Opened** | Although brake coils have been energized, signal is received from brake feedback contact. Check BR1, BR2 terminals, contacts, definitions and related wiring. This error is reported only if [A16=1]. |
| **66** | **SGC Error 1** | Although SGD board has not been energized trough RSG output, SGC input signal is passive [SGC=0]. This error is created only if [A16=1]. Check RSG output and SGC input, related wiring and definitions. |
| **67** | **SGC Error 2** | Although SGD board has been already energized trough RSG output, SGC input signal is active [SGC=1]. This error is created only if [A16=1]. Check RSG output and SGC input, related wiring and definitions. |
| **68** | **Photocell Error 1** | An external photocell error is detected through FE1 input. |
| **70** | **Governor Contact Error-3** | When the motion has been started and coil on the overspeed governor has already been energized, if SGO input signal is still ON [SGO=1], then this error is reported. Check the coil on the speed governor, its wiring and SGO input terminal. |
| **71** | **Rescue Speed Exceeded** | Rescue speed is exceeded during a manual rescue operation. Release brake activation buttons to stop the lift. Do not press brake buttons continuously. Press and release them in short periods while monitoring the car speed not to exceed 0.3 m/s. |

| CODE | ERROR | EXPLANATION |
|---|---|---|
| **72** | **UCM Fault** | Unintended Car Movement UCM is detected. This error is created if the car leaves the door zone with open doors. This error is stationary and must be cleared manually. Check ML1 and ML2 switches and related magnet positions. Check also the UCM device connections and settings. |
| **73** | **Governor Contact Error-1** | If SGO input signal is still OFF [SGO=0] although OSG A3 coil has not been energized, then this error is created. Check SGO definition, contact and wiring. Check the coil on the speed governor. |
| **74** | **Governor Contact Error-2** | SGO input signal is still ON [SGO=1] although OSG A3 coil has already been energized, Check SGO definition, contact and wiring. Check the coil on the speed governor. |
| **75** | **Safety Gear Activated** | Safety gear has been activated. The information is obtained through PFK input |
| **77** | **HD/HU Failure** | High speed switches (HU or HD) are not responding properly. Its state is inconsistent with other shaft switches. |
| **78** | **Encoder Communication Failure** | When a CAN absolute encoder is used as floor selector, [A05=4], this error is created if the system cannot communicate with the encoder. Check encoder wiring and parameter [A05]. |
| **79** | **Encoder Learning Failure** | When incremental encoder is used as floor selector [A05] and if the encoder cannot complete learning process, then this error is reported. Check encoder wiring and parameter [A05]. Check also ML1, ML2, 817 and 818 switches. |
| **82** | **CNT Short Circuit** | This error is reported if the contactor feedback input is still on [CNT=1] while the lift is in motion. Check CNT terminal, contactor aux. contacts and their wiring. |
| **85** | **SDB 141 Fault** | When the car is at door zone and bridging is activated by the controller then 141 must be ON. If not, then this error is created. Check SDB board. |
| **86** | **Door Test Error** | Door test has not been completed at the floor properly. Check door contacts. |
| **87** | **Shaft Inspection Reset** | To return to the normal mode from shaft inspection it is not enough to switch off inspection. KRR input must be trigged once to clear shaft inspection. This message will be displayed after the shaft inspection switch has been returned to normal until KRR is switched once while the doors are closed. |
| **88** | **KL1 Shorted** | Door closed contact of the first door is still closed [KL1=1] though the first door is open. Check contact, wiring and input definition of KL1. |
| **91** | **Speed Error** | Motor cannot catch the speed level driven by the device. |
| **92** | **Slow Down Timeout** | Travel duration in slow down path (while creeping speed is referenced) exceeds the time period defined in parameter [T31]. |
| **93** | **Group Traffic System** | The traffic systems [A02] of the lifts are not all equal. |

| CODE | ERROR | EXPLANATION |
|---|---|---|
| **101** | **Overcurrent** | Driver has detected an overcurrent more than two times of the nominal current for more than 2.5 sec.<br>The weight in Counterweight may be not correct. Check it.<br>Encoder Offset may be wrong. Carry on tuning again. |
| **102** | **Current Error** | Motor current cannot be read by the device.<br>If error arises in REST state: there may be an internal failure in the device.<br>If error arises while motor is running: Electromagnetic disturbances may cause false current reading. Check earthing connections of the device, controller and motor. |
| **103** | **IPM Error** | IPM module sends error signal.<br>**At Start:** [T08]-BRAKE WAIT PERIOD may be lower than the actual brake opening period. Check the value of [T08] and increase it when necessary.<br>**In Motion:** IPM has detected an instantaneous high current. Check if motor parameters has been entered correctly. Check if the counterweight is correct.<br>**At Stop:** [T13]-BRAKE DELAY PERIOD value may be lower than the actual motor brake closing period. Check the value of [T13] and increase it when necessary.<br>[S17]-STOPPING SPEED parameter may be adjusted greater than required. Set it to 0.001 for synchronous motor and 0.002 for asynchronous motor.<br>**During Tuning**: IPM has detected an instantaneous high current. Check the earthing system and connections. |
| **104** | **Encoder Error** | Encoder is not connected or it is faulty.<br>At standby: Check encoder, its connection cables and connectors.<br>**In Motion:** No motion is detected while motion command is present. If the motor rotates check encoder connections and earthing system.<br>If there is no motion in synchronous motor repeat tuning operation. If there is no motion in asynchronous motor check the values of P5-Control Parameters.<br>**During Rotational Tuning:** Rotation of the motor is more than expected. Increase [C20]-TUNING CURRENT parameter to make driving more powerful.<br>**During Stationary Tuning:** Motor rotation is detected. Check motor brakes. They must be closed and able to prevent any rotation during operation. Decrease the value of [C20]-TUNING CURRENT parameter. |
| **105** | **Motor Direction Error** | Motor direction is opposite to encoder direction.<br>**In Synchronous Motor**: Tuning operation may not be completed successfully. Repeat tuning operation.<br>**In Asynchronous Motor**: Reverse the value of the parameter [M17]-ENCODER DIRECTION. |

| CODE | ERROR | EXPLANATION |
|---|---|---|
| **106** | **Motor Cable Error** | Fault in motor cables is detected. The cable connections between motor and the device is faulty or not present. |
| **107** | **ICA Board Error** | **Standby Mode**: Absolute encoder interface board (ICA) cannot communicate with the Absolute Encoder in synchronous motors.<br>Check ICA board and its connections to the encoder. If the cables are correct, then change ICA board.<br>**During Motion or Tuning**: The electromagnetic disturbances generated by the motor driver may influence proper data and signal transmission from encoder to ICA board. Check earthing system and earth connection to the device. |
| **108** | **Overspeed Error** | Encoder speed is greater than 115% of reference speed.<br>Check the values of P5-CONTROL PARAMETERS.<br>Increase value of Kp in the region, where overspeed is detected, till below where motor vibration starts. |
| **109** | **Low Speed Error** | Motor cannot reach reference speed.<br>Check the values of P5-CONTROL PARAMETERS.<br>Increase value of Kp in the region, where speed cannot reach set speed, till below where motor vibration starts.<br>Check encoder, its connection cables and connectors.<br>In Synchronous Motor: Repeat tuning operation. |
| **110** | **Motor Overspeed Error** | Encoder speed is greater than 150% of motor nominal speed.<br>Reference speed may be greater than nominal speed.<br>Acceleration value S10 may be adjusted to high. |
| **112** | **Permanent IPM Error** | IPM sends continuously error signal to the motor driver.<br>IPM module of the device should be faulty. |
| **113** | **Internal Communication Error** | Failure in communication between internal microprocessors.<br>If the error arises only when the motor is driven then electromagnetic parasite may influence the device internal communication. For this, check earthing and related cables. If they are correct, then the device should be faulty. |
| **115** | **DC Bus Reading Error** | DC BUS voltage in the device is greater than the value of the parameter U03-DYNAMIC BRAKE OPEN while motor driver is not active.<br>Check the value of U03 and U07-LINE VOLTAGE. |
| **116** | **STO Supply Error** | STO circuit is active but no voltage in motor driver is detected.<br>**In Starting:** Check STO circuit (SER board or contactors).<br>**In Stopping:** Motion command is removed before motor stopped. Check [S17]-STOPPING SPEED parameter. |

| CODE | ERROR | EXPLANATION |
|---|---|---|
| **117** | **Zero Speed Error** | Device cannot hold the motor at zero speed.<br>First of all, check balance of the lift, namely counterweight.<br>If the error arises although there is no motor driving check earthing and related connections.<br>**In Starting with Synchronous Motor:** Pre-torque function should be activated.<br>**In Stopping:** Check the value of [S16]-Stopping Mode parameter. |
| **118** | **Remaining Distance Error** | Error in calculating Remaining distance.<br>The data coming from encoder may be wrong due to electromagnetic disturbance. Check earthing and related connections. |
| **119** | **STO Enable Error** | No voltage is present in motor driving circuit after a motion command.<br>Check STO circuit (SER board or contactors) and related connections. |
| **120** | **Current w/o Motion** | Motor current is detected while no motion command is present.<br>There may be fault in current reading circuit of the device.<br>There may be short circuit in motor to its body. |
| **122** | **Car Position Error** | Read shaft data is inconsistent in learning process.<br>Shaft learning operation may be carried out improperly.<br>Check firstly the locus of the magnets and magnetic switches, clear shaft data and then repeat shaft learning process. |
| **123** | **Tuning Error** | An error arised during **rotating tuning** operation.<br>No rotation of the motor is detected.<br>Be sure that the traction machine is not connected to the ropes.<br>Be sure that the brakes are opened.<br>If all are OK, then increase the value of [C20]-TUNING CURRENT to make the motor more powerful. |
| **124** | **High Voltage** | Voltage value in dynamic braking is greater than the operating value of the system.<br>Check braking resistor and its connections.<br>Check if the value of the braking resistor has been selected regarding to the table in user manual. |
| **125** | **Unbalanced Stator Resistance** | The resistances of the stator windings are not balanced.<br>Disconnect motor cables from the device and measure the winding resistances one by one.<br>Measure the conductance of the windings to the motor body or earth.<br>If the measure coil resistances are not all equal or there is a short to the motor body, then contact motor supplier.<br>If the coils are balanced and no short is measured, then check the cables between motor and the device motor output. |