

# AE-MAESTRO

## Integrated Lift Control System

### INSTALLATION MANUAL



**Document Name** : AE-MAESTRO Lift Controller Installation Manual  
For Pre-Wired Shaft Connection

**Document Code** : AEM-INSEN-PW-81-1-20

**Document Version** : 1.01

## A.PREFACE

This document is written to guide installation of the lift controller for pre-wired system. It consists of first essential tasks to carry on before lift operation. This document should be used in accordance with AE-MAESTRO user manual where detailed information about all subjects mentioned here are present. The mechanical installation of some detectors are explained in this manual. However, please take care of the drawings or documents of mechanical parts related to their fixing points since the scope of this manual is limited only to electrical parts.

### CAUTION

\* **Before starting the installation, it is important to read the user manual and all the instructions in this document.**

\* **Installation must be performed only by authorized person.**

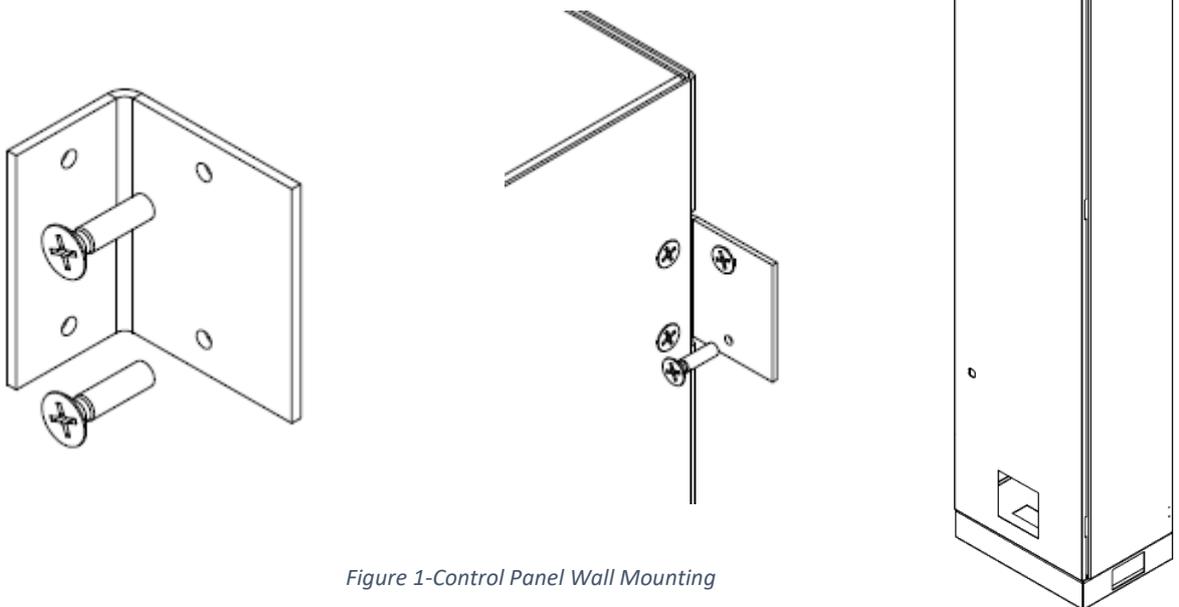
## B.INSTALLATION

Pre-Wired system has been designed to make installation easier and faster. All the cables have either plug and play connectors if they are going to be connected to another socket or dummy terminals to avoid any short circuit. There are labels on all free cables and cable groups with their related information written on them. To avoid any wrong connection, check the labels before connecting any socket or terminal.

Check the wiring diagram if it before starting.

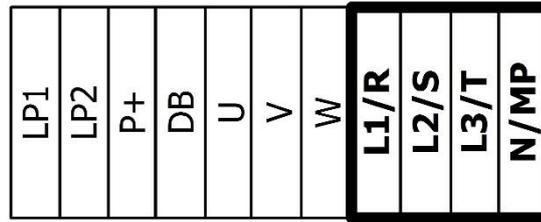
Carry on the steps one by one.

1. Fix the control panel to the wall as shown in *Figure 1*.  
The size and shape of the control panel can be changed depending on the application.



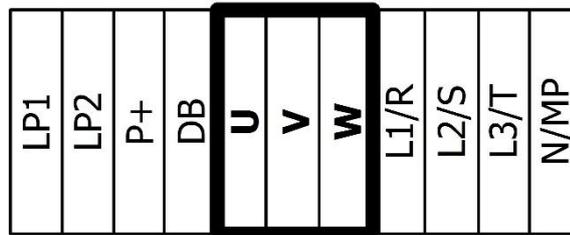
*Figure 1-Control Panel Wall Mounting*

2. Connect the power line to the terminals **L1/R**, **L2/S** and **L3/T** as shown in *Figure 2* in bold frame.



*Figure 2-Main Line Connection Terminals*

3. Connect the motor power cables to the terminals **U**, **V**, **W** as shown in bold marked block *Figure 3*.

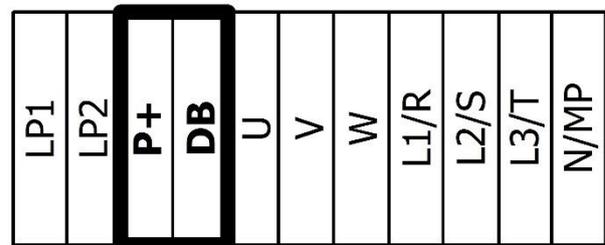


*Figure 3- Motor Connection Terminals*

4. Mount the braking resistor shown in *Figure 4* onto the wall. Do not put it inside the controller box. Please be aware that it will emit heat to the surroundings. Connect the terminals of the braking resistors to the terminals **P+**, **DB** as shown in *Figure 5*.

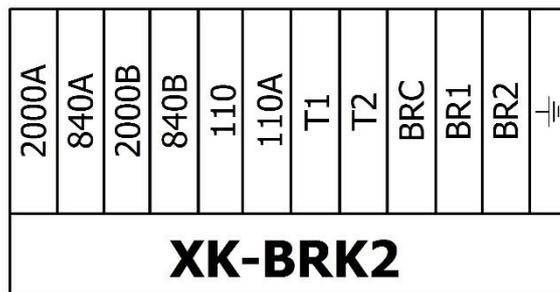


*Figure 4- Braking Resistor*



*Figure 5- Braking Resistor Connection Terminals*

5. XK-BRK2 terminal group is for motor electrical connections except power is shown in Figure 6. Connect related cables in accordance with your diagram. The functions a related terminal name are as follows:
  - a) *Motor Brake Connection (2000A-840A, 2000B-840B),*
  - b) *Brake Contact (BRC, BR1, BR2),*
    - i. Brake Contacts are Normally Close (NC) contact and they have an important role for safety for gearless machine. For that reason, be sure that they are working perfectly, after finishing motor connection and switch on the control panel check those connection.
  - c) *Motor Thermistor connection (T1, T2),*
  - d) Connect them in accordance with your diagram.



*Figure 6-Brake and Micro Switches Connection Terminals*

6. After making sure of all connections, switch on the Control Panel in Inspection mode. Then carry on the followings:
  - a. Read the motor rating and electrical values written on the motor label and enter them to the motor parameters.
  - b. Connect the encoder cable to the related terminals and enter the Encoder model [C16] and number of pulses of encoder [C01] to the AE-MAESTRO.
  - c. In order to use gearless motors Tuning Process must be completed successfully. The tuning process is explained in Apendix-1. First carry on tuning. Once you have completed tuning then you can continue to the next step.
  - d. After performing the tuning process run the lift in inspection mode. If no problems in inspection travel is observed then go on otherwise return to the tuning and try to solve the problem.
  
7. Hang the ropes and start car mechanical installation.
  
8. The car top box installation should be carried out.
  - a) Fix Cartop Box (Inspection Box) onto the car frame as described in your mechanical project.
  - b) Flexible cable is already equipped with connectors on both ends. Connect it to the related terminals on the inspection box which has PWL and PWH boards inside it.
  - c) To intercommunicate COP and inspection box, you should connect the wiring between COP and inspection box.
    - i. Connect the cable labelled **CON(A)** to the related terminals onto PWL board in inspection box and PWS board in Car Operating Panel (COP).
    - ii. If you have two COPs inside the cabin, then connect **CON(B)** to the related terminals onto PWL board in inspection box and PWS board in second COP.

- d) In AE-Maestro system;
  - i. Door Open represented with **KA**,
  - ii. Door Close represented with **KK**,
  - iii. And common terminal of them represented with **KO**,

Connect the command signals of your Door Operator to these terminals.

- e) Connect the other auxiliary units (e.g. Door Board) is already designed and the relevant connections in your project are shown in detail.

9. AE-MAESTRO has a special mode to simplify the installation process. It will be active only in inspection mode and if you set [A15=1]. When the Installation Mode is active, then the controller will bypass some inputs and some errors. That will be make installation easier for you. For more information about this feature, refer to the user manual.

10. Connecting the 817 and 818 limit switches.

- a) Mount the 817 and 818 magnetic limit switches to the car frame as shown in *figure 7*.
- b) Place the round magnets onto the rails as shown in *figure 8*.
- c) The distance of the first magnet from the base and top floors is denoted a  $x$  in the Figure.  $X$  varies depending on the nominal speed of the lift. Some sample  $x$  values are shown in Table 1
- d)  $X$  is the distance of forced slow down for the lift. If the car comes to 817 or 818 level and continues at nominal speed without stating to decelerate then the controller makes the car slow down.
- e) The controller must see 817 and 818 after entering the deceleration path. Otherwise the deceleration to the top and bottom floors is always forced. This decreases comfort.
- f) 817 and 818 levels are also reference points to calibrate the counter systems for all floor selector models except absolute encoder where no calibration or resetting is required.
- g) 817 and 818 switches are Bi-stable.



Figure 7- 817 and 818 Bi-Stable Magnetic Switches

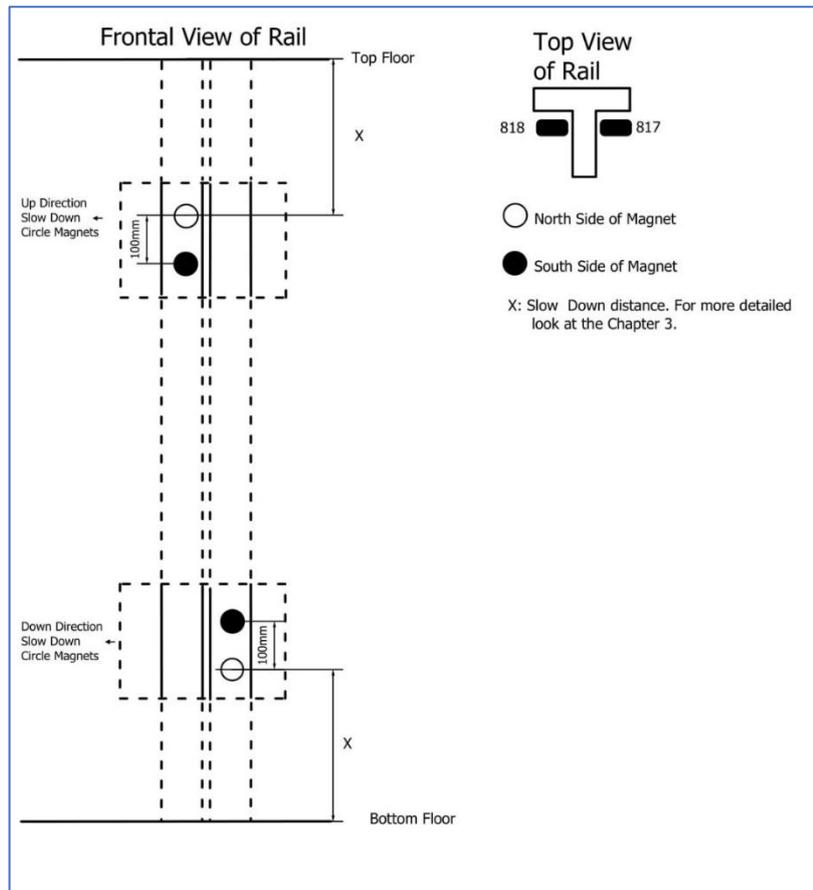


Figure 8- 817/818 Magnets Positions on Guide Rails

Nominal Speed (m/s)	Deceleration Distance	Distance from top floor level for 818
		Distance from bottom floor level for 817
0,60 m/s	83 cm	80 cm
0,80 m/s	123 cm	120 cm
1,0 m/s	143 cm	140 cm
1,20 m/s	183 cm	180 cm

Table 1 – Deceleration Distances

Connecting ML1 and ML2 magnetic switches.

- h) Mount ML1 and ML2 switches to the car frame as shown in *figure 9*.  
ML1 must be located above ML2. This is very important since ML1 is the reference switch in counting floor selector systems when shaft and motor encoder selected.
- i) Place strip magnets onto the rails as shown in *figure 10*. The length of the strip magnets determines the length of door zone. The door can be opened only and only if ML1 and ML2 are both are in front of the magnet strip. Therefore, **the center of these magnets must be located exactly at the floor levels**.
- j) ML1 and ML2 switches are mono-stable.



Figure 9- ML Magnet Position on Rail

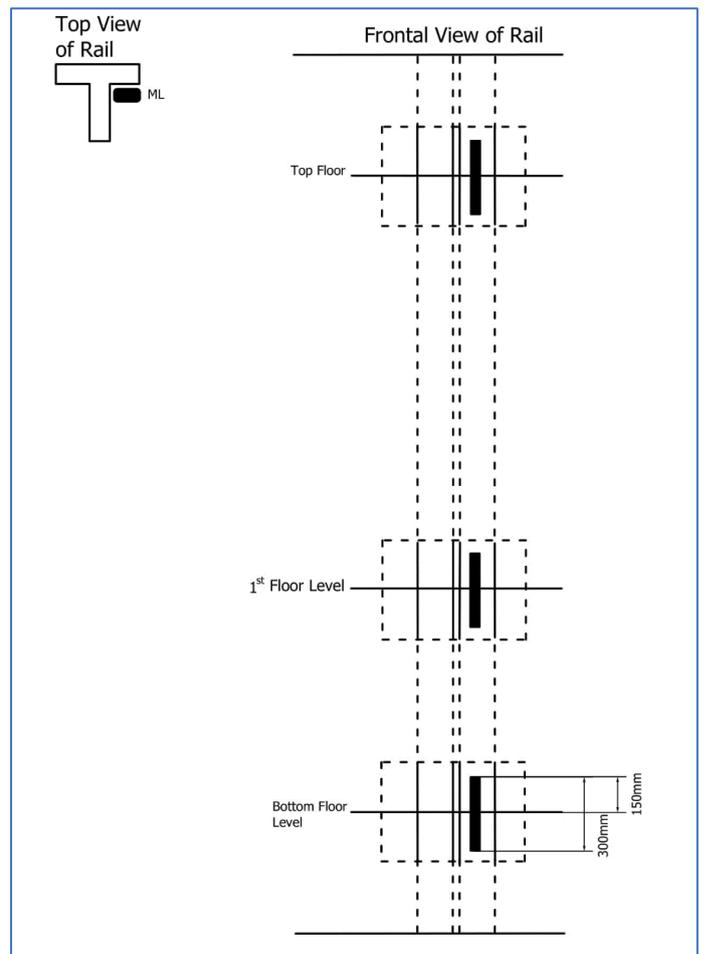


Figure 10- ML1 and ML2 Magnetic Switches

**11.** Then move the car anywhere above 817 switch and then move down in inspection mode.  
Check the state of 817 switch on the screen.

- a) When the car passes 817 magnet downwards then 817 must be OFF (817=0).
- b) When the car passes 817 magnet upwards then 817 must be ON (817=1).

If this is the case 817 switch is OK, otherwise check the side of the magnet placed and connections.

**12.** Then move the car anywhere below 818 switch and then move up in inspection mode. Check the state of 818 switch on the screen.

- a) When the car passes 818 magnet upwards then 818 must be OFF (818=0).
- b) When the car passes 818 magnet downwards then 818 must be ON (818=1).

If this is the case 818 switch is OK, otherwise check the side of the magnet placed and connections.

**13.** Check well limit stops. Use **Recall station in controller box** for this test.

- a) Move the car downwards beyond the level of the base floor. **120 circuit must be OFF.**
- b) Move the car upwards above the level of the base floor. **120 circuit must be ON.**

If this is not the case check the mechanical limit switches.

**14.** After having balanced lift then you should adjust floor levels. AE-MAESTRO has a special utility for this purpose. Read and follow the instructions in section 5.1.2 in AE-MAESTRO manual to carry on adjusting levels.

**15.** After all floor levels has been adjusted then go to the test menu. Here give a number for the lift to travel. Then the lift will travel randomly in the shaft as given times. During this test you can observe the behaviour of the lift and any error in installation or parameter adjustments.

**16.** If everything seems to be correct then you may open the lift to the service.

## APPENDIX-1 TUNING

To carry out the AE-Maestro Motor Tuning Process you must follow and execute the following points:

1. First of all be sure that Motor-Parameter and encoder pulse are correctly entered to following menu path;

G2-Parameter -> P6-Motor Parameter

2. To check the Encoder type and Encoder pulse, look at the Encoder label and enter them to following menu.

G2-Parameter -> P6-Motor Parameter -> M1-Encoder Pulse

G2-Parameter -> P6-Motor Parameter -> M16-Encoder Type

3. Choose the Tuning Mode on Parameter:

G2-Parameter ->P6-Motor Parameter M18-Tuning Mode

The device has two different tuning mode which are;

### 1-Stationary Tuning

In this tuning process motor does not rotate. Therefore, it can be used for motor with ropes already connected onto it.

### 2-Rotational Tuning

In this tuning process motor rotates. Therefore, all ropes must be disconnected.

Select the suitable one for your system.

4. To allow to enter the Tuning menu,
  - a. Switch on inspection mode,  
The lift must stay in inspection mode until the end of the tuning process.  
Switching on into the normal mode terminates the tuning process.
  - b. Safety line must be closed.  
Pressing Run button in inspection mode, will close the safety line.
5. If Tuning process has been executed correctly then ...
  - a. Run the lift in inspection mode upwards and observe the speed.
  - b. Run the lift in inspection mode downwards and observe the speed.

If you observe any incorrect speeds during these travels then repeat the Tuning Process.

6. If Tuning Process fails then do the followings:
  - a. Interchange two motor lines (such as U and W) and execute Tuning again,
  - b. Change Encoder Direction stored in parameter [M17].
  - c. To find the correct phase sequence repeat items 'a' and 'b'.