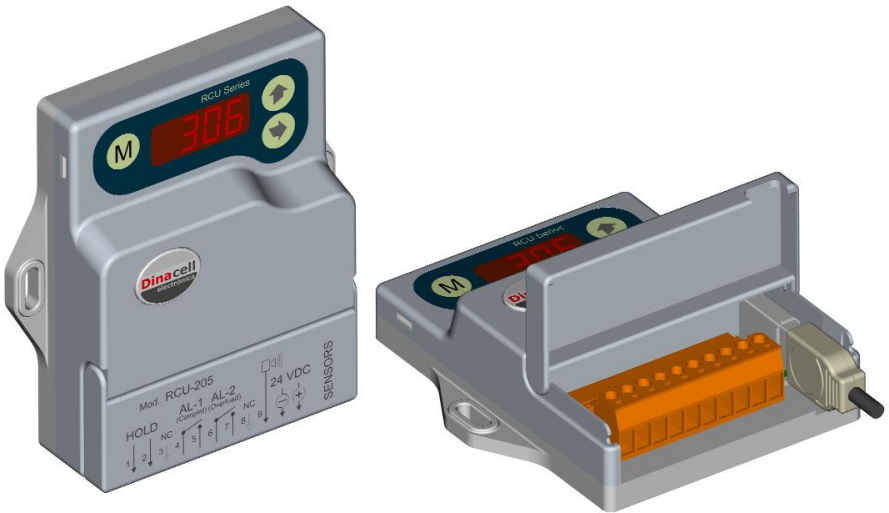# Instructions Manual

Control Unit RCU205

1. Introduction

RCU device main field application is the load limitation in elevators. The measurement accuracy is higher than the usually required.

This device measures the weight supported by the load cell and activates the relays when the programmed levels are overflowed .The relay contacts may inform to the elevator control board about the programmed levels status.

2. Installation and connections
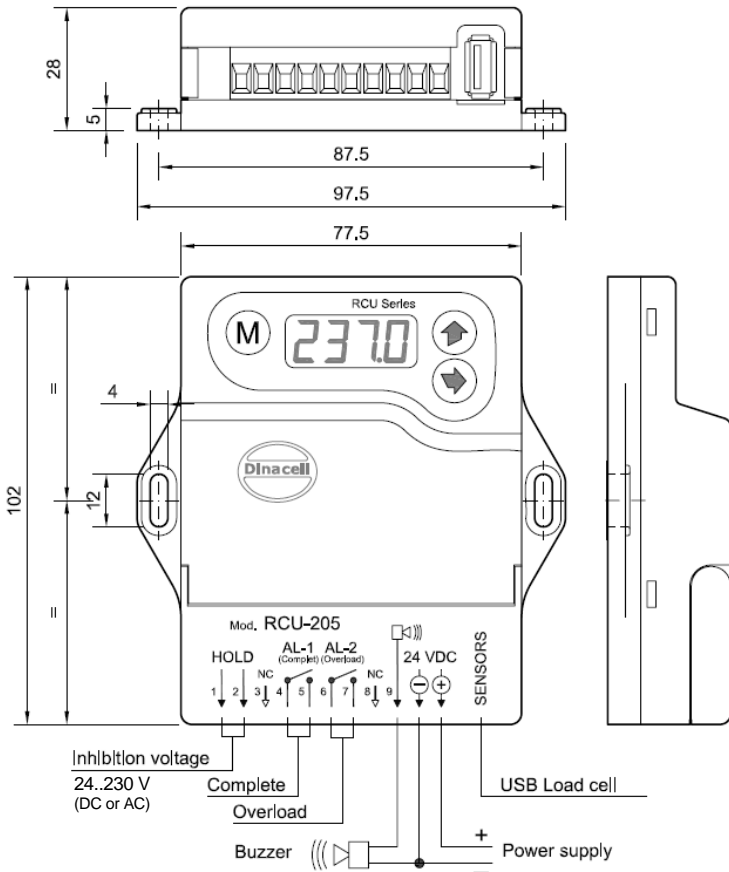
3. Control, inputs and outputs.

- HOLD: Hold is a universal input with a voltage range from **24 to 230V** AC or DC. This input is used to communicate the RCU that the elevator is in motion state and it works as follows:
  - o Hold function activates when the doors are closed, and blocks the weighing process to avoid the relays change the status while the elevator is moving.
  - o When it is activated it retains the real value inside the cabin and for any weight variation when the elevator moves from one floor to another will be considered as added weight to make chain compensations.

  The use of this input is optional, but necessary if chain compensation is required.

  Remarks: When the hold signal is activated the device shows "HOLD" blinking in the display.

- RELAYS: Two relays with an opened free voltage contact which status change when the load level is higher than the programmed level.

- BZ: External buzzer. The device allows to connect a 5V buzzer between the negative pole power supply and the 9th pin

- SENSORS: USB Connection for the load cell.

4. Access to menu parameters.

(M) Menu key. Pressing this key, the device will enter into the parameters program mode, and show the first parameter AL1. Afterwards pressing this key successively all the programmable parameters are shown in cycle way. To go back to the weight presentation, press the key several times until the end of the menus.

Press this key to enter on the chosen parameter to modify the value.

This key is to change the digit value when we are setting the parameters.

5. Parameters modification.

Alarms Modification.

1. Press successively the key Ⓜ until select the desired alarm.
2. Press the key ⊕ to enter in parameter modification. The left digit will blink.
3. Select the wished value in the display using the keys ⊕ and ⊕.
4. Press twice Ⓜ to set the chosen load level value. If it is pressed only once, after 10 seconds the process finishes without saving the change.
5. Change the idle status of the relay with the key ⊕.(On = Close, OFF = Open)
6. Press twice Ⓜ to save the changes. If it is pressed once, after 10 seconds the process finishes without saving the change.

Remarks:

When the device has no power supply, the relay status is OFF = Open.
The overload has to be connected in the alarm/relay 2

Parameters Modification (no alarm)

7. Press successively the key Ⓜ until select the desired parameter.
8. Press the key ⊕ to enter in parameter modification. The left digit will blink.
9. Select the wished value in the display using the keys ⊕ and ⊕.
10. Press twice Ⓜ to save the change. If it is pressed once, after 10 seconds the process finishes without saving the changes, and the display shows again the parameter.

6. Menu structure

Pressing successively the key Ⓜ the menu parameters are shown in the following order:

2836	Device in weighing mode.
Ⓜ	
AL 1	Alarm level 1 and relay rest status 1(On/OFF)
Ⓜ	
AL 2	Alarm level 2 and relay rest status 2(On/OFF)
Ⓜ	
CEro	Zero Setting
Ⓜ	
PESO	Adjustment of sensibility with a well known weight
Ⓜ	
CELL	Adjustment of sensibility with the nominal load of the cell
Ⓜ	
CAdE	Maximum value of chain compensation weight
Ⓜ	
SOn	Alarm Sound (On/OFF; Intermittent sound with the alarm 2).

7. Unit control adjustment.

This section is required for the unit to know the relation between the signal from the cell and the known-weight set in the cabin. It is recommended to make the adjustments at the lowest floor.

The adjustment is made in 2 steps as follows:
1. <u>Zero Setting.</u>
2. <u>Sensibility Adjustment</u> (for this adjustment there are 2 methods).
    a. Sensibility Adjustment with a well known weight.
    b. Adjustment with direct transmission load cells.

<u>Zero Setting:</u>
1. Select menu option $\boxed{\text{CEro}}$.
2. Check that the cabin is empty and press key $\circledast$, and the display will blink.
3. Press $\circledM$ while the display is blinking to confirm the operation which starts with a 10 seconds countdown. The display will show parameter $\boxed{\text{CEro}}$ at the end.

   Remark: If $\circledM$ is not pressed before the blinking finishes, the operation will be not saved.

<u>a. Adjustment of weight</u> (valid for all kind of load cells).
1. Introduce inside the cabin a well known weight (it is recommended a minimum weight of 50% of the maximum load applied inside the cabin).
2. Select menu option $\boxed{\text{PESO}}$, and press $\circledast$ to enter into modification state.
3. Set the value of the well known weight with the keys $\circledast$ $\circledast$.
4. Press the key $\circledM$ twice (The unit will start a 10 seconds countdown and the value will be saved).The display will show parameter $\boxed{\text{PESO}}$ at the end.

   Remark: If $\circledM$ is not pressed before the blinking finishes, the operation will be not saved.

<u>b. Adjustment with direct transmission load cells.</u>
1. With this method it is not required to put a well known weight in the cabin.
2. Select the menu option $\boxed{\text{CELL}}$ and press $\circledast$ to edit the value.
3. Input the value of the nominal load of the cell with the keys $\circledast$ $\circledast$. In case of having several load cells the input value should be the sum total of them.
4. To save the value press twice $\circledM$ (the value remains saved).

   Remark: If $\circledM$ is not pressed before the blinking finishes the operation will not be saved.

8. Compensation chain

The chain compensation is a software algorithm that verifies the weight difference between flats and compensates it.
The HOLD signal must be activated when the doors are closed, to compensate the weight during the elevator movement.
`CAdE` should have the estimated weight of the chain.

Chain compensation is not applied if value is set to zero .The default value of `CAdE` is zero.
The maximum CAdE compensation value of the unit is "0050" (this is the maximum weight value to compensate the chain weight).

9. Specifications

Nominal voltage: 24 Vdc
Maximum current: 80mA
Short circuitable power supply, internal fuse is not needed.
Relay contact current: 3A/250Vac.
Box: VO fireproof plastic IP-60

10. Error codes and tTroubleshooting

	Error description	Action
`Err1`	Load cell wrong connected, broken down or cable is cut.	Check the load cell connection.
`Err2`	Negative overflow of the converter, so the load cell is giving a negative signal too high.	Check the load cell connection because it should be no negative charge.
`Err3`	Positive overflow. Load cell is supporting a higher weight than the nominal load.	It is necessary to use a load cell with higher nominal load.
`Err4`	Polarity error. It is detected when the control unit is adjusted with a well known weight and the polarity is changed, or the weight is not in the cabin during the adjustment.	Check the load cell connection. Adjust again on zero and weight.
`Err6`	Data loss in memory.	Reprogram the unit.
`Err7`	Load cell with very low sensibility. Usually the unit is wrong adjusted.	Adjust again on zero and weight.

Remark: When an error is produced all the alarms are activated and the elevator remains blocked. If `Err6` is produced the relay contacts will open (RELE = OFF).

11. Quick programming guide.

1) Install the sensor and connect it to the unit control.

To connect properly the sensor to the unit control, please see section **Nº.1** (Installation)

2)Before to start to calibrate the unit control, please be advise to do the following:

  a). Down the cabin to the lowest floor of the building. (or in the half way of the itinerary)

  b). Bounce inside the cabin to avoid possible hooks on the guide rail.

3) Most important parameters to calibrate step by step:

1. Adjust the `CEro` with the cabin empty.

2. Place a well known weight in the cabin (minimum 50%).

3. Adjust the `PESO`. Input the value of the well known weight.

4. Adjust alarm `AL1` with the load value that activates the relay 1, and the relay state.

   *(Remarks: On this parameter you could assign the **full load** alarm)*

5. Adjust alarm `AL2` with the load value that activates the relay 2, and the relay state.

   *(Remarks: On this parameter you could assign the **over load** alarm)*

6. Input in `CAdE` the estimated weight of the chain.

7. Choose the `SOn` status (On = Overflow sound activated)

Remark: It is important to adjust zero before the weight adjustment.