Instructions manual

Cable Load Limiters

LMPK & LMGK

1. Introduction

LMxK load limiter is the result of the evolution of industrial weighing systems designed to limit load, and based in the measurement with strain gages.

The main field of application is lifting devices, where load limitation is needed, offering measurement accuracy higher than usually required.

The function of this device is to measure the load and notify thought the relays if this load exceed the established levels. These levels have to be programmed to the alarm relays which act on the control panel.

2. Dimensions and Capacity
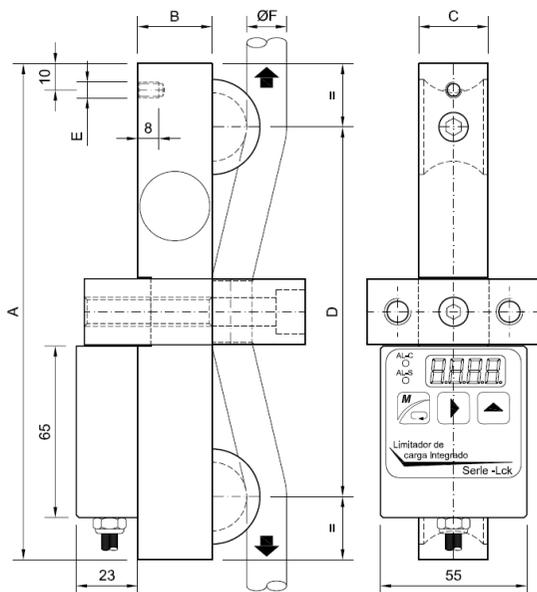
Model	Capacity	A	B	C	D	E	ØF	Cable
LMPK	1000 kg 2000 kg 3500 kg 7000 kg	188	28	26	140	M6	7/26	4m
LMGK	15000 kg 20000 kg	332	32	36	260	M8	19/32	4m

3. Connection and colours code

LMxK connection is through cable 4 meters long with 6 wires and shield. The color code and functions are as follows:

Colour	Function
Red	*Positive supply (+24V)*
Black	*Negative supply*
Yellow-Blue	*Volt-free contact. Relay 1 (AL 1)*
White-Green	*Volt-free contact. Relay 2 (AL 2)*
Shield	*Ground (GND)*

4. Control Outputs (Alarms).

LMxK limiter has 2 relays that change the status depending on the programmed parameters.

We can program the next parameters for the alarms:

- (AL-1, AL-2) Alarm trigger level, when the load crosses this level the alarm is activated.
- The resting status of the relays: that means the relay status when the load does not reach the trigger alarm level.
    - ON   Relay active,   closed contact.
    - OFF   Relay inactive ,   open contact .
- • (tiE) The time-delay in tenths of a second. The default value is 0000, but it is usual to use it when lift load is near of the crane limit (Example: 0030 = 3 seconds).

Operation:

When the load exceeds the alarm threshold level, a timer starts counting time, and when it reaches the delay time (tiE) the alarm is activated (change the relay status).

- The alarm is not activated if the level of load decrease below the trigger alarm level before the timer reaches the delay time.
- If the average of load exceeds 120% of the trigger level, the alarm will be activated immediately, ignoring the delay time.

- If the load exceeds 140% of the trigger level, the alarm will be activated immediately (about 30msg).
- If the delay time is zero, the relay will be activated immediately when the load exceeded the threshold level.

Alarms can be configured with negative values, making easier the detection of "SLACK CABLE".

The relays have a normally open volt-free contact. It is important to note that if power turn off, the relay contact opens.

5. Access to menu parameters.

Pressing this key successively all the programmable parameters are shown in cycle way. To go back to the weight presentation, press the key until the end of the menus, or press it during 3 seconds.

Once there is a parameter selected, press this key to modify the value

If this key is kept pressed when there is a parameter selected, the display shows the value of that parameter.

6. Modification of parameters.

Modification of an alarm.

1. Press successively key 📷 until select the wished alarm.

2. Press Key ▶ to enter in parameter modification. The left digit blinks..

3. Select the wished value in the display using keys ▲ & ▶.

4. Press Key 📷 to introduce the chosen value .

5. Change the relay status with key ▲.

6. Press twice 📷 to save the change. If it is pressed once, after 10 seconds the process finishes without saving the changes.

Modification of a parameter (no alarm)

1. Press successively key 📷 until select the wished parameter.

2. Press key ▶ to enter in parameter modification. The left digit blinks.

3. Select the wished value in the display using keys ▲ & ▶.

4. 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.

7. Programming 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 status relay 1 (Led indicator AL-C)
`AL2`	Alarm level 2 and status relay 2 (Led indicator AL-C)
`CEro`	Adjustment on zero
`PESO`	Adjustment of sensibility with a well known weight
`CELL`	Adjustment of sensibility with the nominal load of the cell
`tiE`	Adjustment of alarm timer

8. Unit control adjustment..

This chapter is necessary for the unit to know the relation between the signal from the cell (output) and the weight supported by the crane or hook. The adjustment is made in 2 steps as follows:

1. **Setting of zero**. `CEro`

2. **Adjust of sensibility** `PESO`.

Setting of zero:

1. Select menu option `CEro`.

2. Check that the hook is empty and press key ▶. The display will blink

3. Press key 🖰 while the display is blinking to confirm the operation that starts with a countdown. At the end the display will show parameter `PESO`.

Note: If not pressed 🖰 before the end of intermission, the operation is not stored, and the display shows the parameter `CEro`.

Adjustment of sensibility:

a. Adjustment of sensibility with a well known weight

1. Hang on the hook a well known weight (it is recommended a minimum weight of 50% of the LMK nominal load).
2. Select menu option `PESO`, and press ▶ to enter in modification.
3. Input the value of the well known weight with the keys ▲ ▶.
4. Press 🖰 twice (The unit starts a countdown and the value remains saved). Then the display will show the next adjusting parameter `CELL`.

Note: If not pressed 🖰 before the end of intermission, the operation is not stored, and the display shows the parameter again. `PESO`.

9. Electrical characteristics

- Nominal Tension 24 Vdc
- Maximum current less than 100mA
- 2 Relays:

> 1 Open contact potential free.

> 5 Amperes 30VDC

> 5 Amperes 250 VAC.

10. Errors presentation.

	Error description	Action
`Err2`	Negative overflow of the converter, so the load cell is giving a negative signal too high.	Return to factory
`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 hook during the adjustment.	Adjust again on zero and weight.
`Err6`	Data loss in memory.	Program again.
`Err7`	Load cell with very low sensibility. Usually the unit is wrong adjusted.	Adjust again on zero and weight.

Note: When an error occur all the relays are open and (RELAY = OFF).

11. Quick programming guide.

1. Adjust alarm ▢ with the load level value that activates the alarm 1 ,selecting the resting status relay (ON= Active relay ,closed contact)

2. Adjust alarm ▢ with the load level value that activates the alarm 2, selecting the resting state relay (ON= Active relay ,closed contact)

3. Place the hook one meter above the floor.

4. Adjust the ▢ with the crane free of weight .

5. Place a well known weight in the hook (minimum 50% of the LMxK nominal load).

6. Adjust the ▢. Input the value of the well known weight.

7. Adjust the alarm timer ▢

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