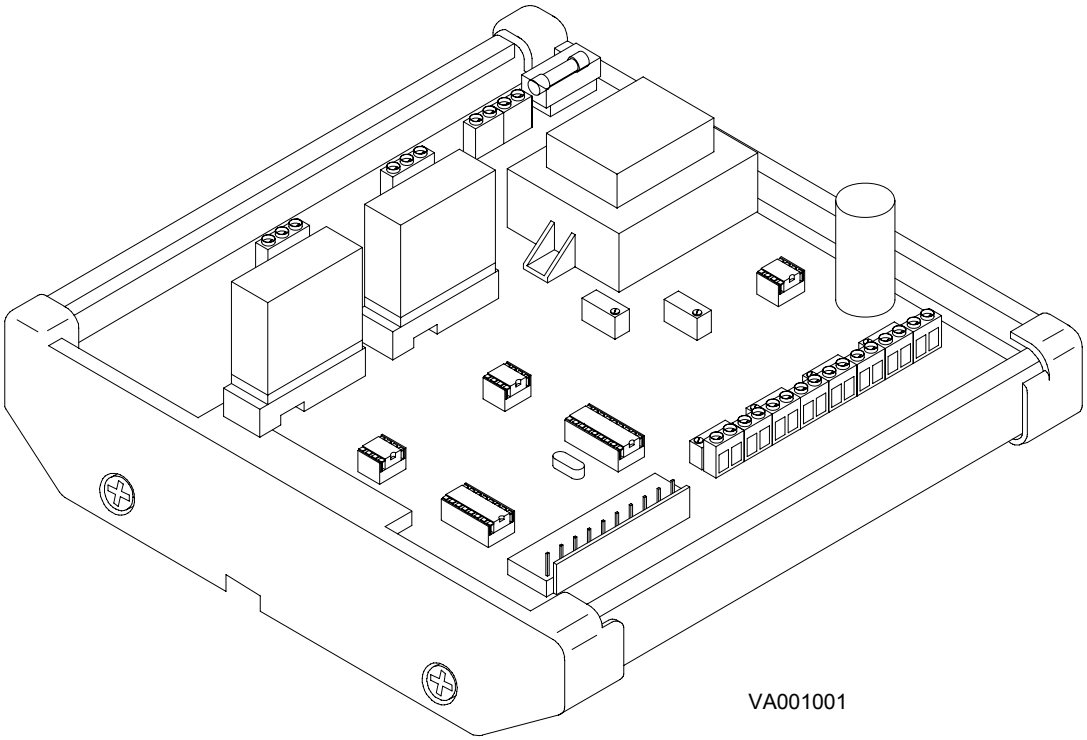
Itowa

USER MANUAL

LOAD LIMITER



VA001001

USER MANUAL

LOAD

LIMITER

LS2

ITOWA

MALIMLS2GB

REV 0

07/07/15

Approved by the Engineering Manager: I. Martínez

TABLE OF CONTENTS

1. INTRODUCTION

LS2 is a high-precision and safety load limiter preventing accidents and protecting overload breakdowns in overhead cranes and hoists.

It can also be applied to lifts, weight lifters, rope tensioning systems and in general to any system or installation where a wire rope is subjected to traction and want to limit the maximum tension.

It improves precision and reliability of traditional alternative of motor load limitation.

2. LS2 LOAD LIMITER OPERATING

The load limiter, by design, is intrinsically safe, that is, in case of failure or disconnection of the strain gauge wire, it will stop all working operations. The limiter circuit have 2 relays able to cut a current of 16 A at 230Vac. These relays can be programmed, one of them works like a maximum load relay with 2 tripping-out points: one instantaneously and the other delayed, that allows to adjust the instantaneous trip at 110% of load and the delayed at 100% of load, the other relay works like a minimum load relay. Another way of programming allows that both relays works as maximum load relays, with a programmable timer.

Hereinafter we will refer to the delayed time operation as mode **TWO**, and the maximum and minimum mode as **ONE**. These two ways of programming are automatically selected depending on the connection or disconnection values put on the relay **TWO**.

2.1. OPERATING IN MODE ONE

Operating in mode **ONE** allows to adjust the relay 1 as maximum load relay (with 2 tripping-points, one instantaneously and other delayed), and the relay nº 2 as minimum load relay (snack cable detection).

When the load applied to the hoist exceeds one of the two programmed values, instantaneously or delayed, the maximum load relay (point of disconnection of relay 1) will be deactivated immediately impeding the lifting operation. This relay will be automatically reactivated when the load value falls below a previously set value, this point will be called connection point of relay 1.

If the system has disconnected for exceeding the maximum instantaneous load, it connects when the load falls below the disconnection value. If it has tripped for the delayed load value, it will be connected when it falls below its respective value.

Normally, the value of time delayed disconnection relay 1 will be scheduled lower than programmed in disconnection instant value. This operating allows you to prevent oscillations of the load produced by inertia at the time of start lifting a mass whose value is close to the maximum load the limiter shoot.

The design of the timer of relay 1, allows that in case of a load swings above and below of the relay disconnection point, it will not turn off until the applied load does not exceed the programmed value in relay 1, a time higher than the programmed in the timer.

NOTE: THE VALUE PROGRAMMED IN CONNECTION POINT MUST ALWAYS BE LOWER THAN THE ONE PROGRAMMED IN THE DISCONNECTION POINT.

When the load value drops below the programmed value in the relay 2 (point of disconnection of relay 2), it will deactivate impeding the dropping operation. It will reactivate when the value of the load exceeds the set value at the point of connection of the relay 2

NOTE: THE VALUE PROGRAMMED IN CONNECTION POINT MUST ALWAYS BE HIGHER THAN THE ONE PROGRAMMED IN THE DISCONNECTION POINT.

2.2. OPERATING IN MODE TWO

Operating in mode **TWO** allows adjusting the relay 1 to operate identically as the mode **ONE** do, while relay 2 can be set as relay 1 but with a different tripping value and timing. This operating allows acting on the second lift speed from a certain load permitting only activate the first speed.

3. ASSEMBLY OF LS2 LOAD LIMITER

Connection of the LS2 limiter is extremely easy, following the detailed instructions on the diagrams Fig. 1 & 2.

The load limiter can be connected to a hoist in various ways, in Fig.2, diagrams A,B,C,D are described the most common uses:

A. With the load limiter in mode **ONE** and connected as indicated in diagram A, the overload limits the lifting

B. With the load limited programmed in mode **ONE** and connected as indicated in diagram B, the overload limits the lifting and the snack cable limits the descends

C. With the load limiter programmed in mode **TWO** and connected as indicated in diagram C, limits the lifting in two different values of maximum load: one instantaneously and the other with a slightly lower timed value

D. With the load limiter programmed in mode **TWO** and connected as indicated in diagram D, the second lifting speed is limited with a load value, while the first speed is limited with a higher level of load.

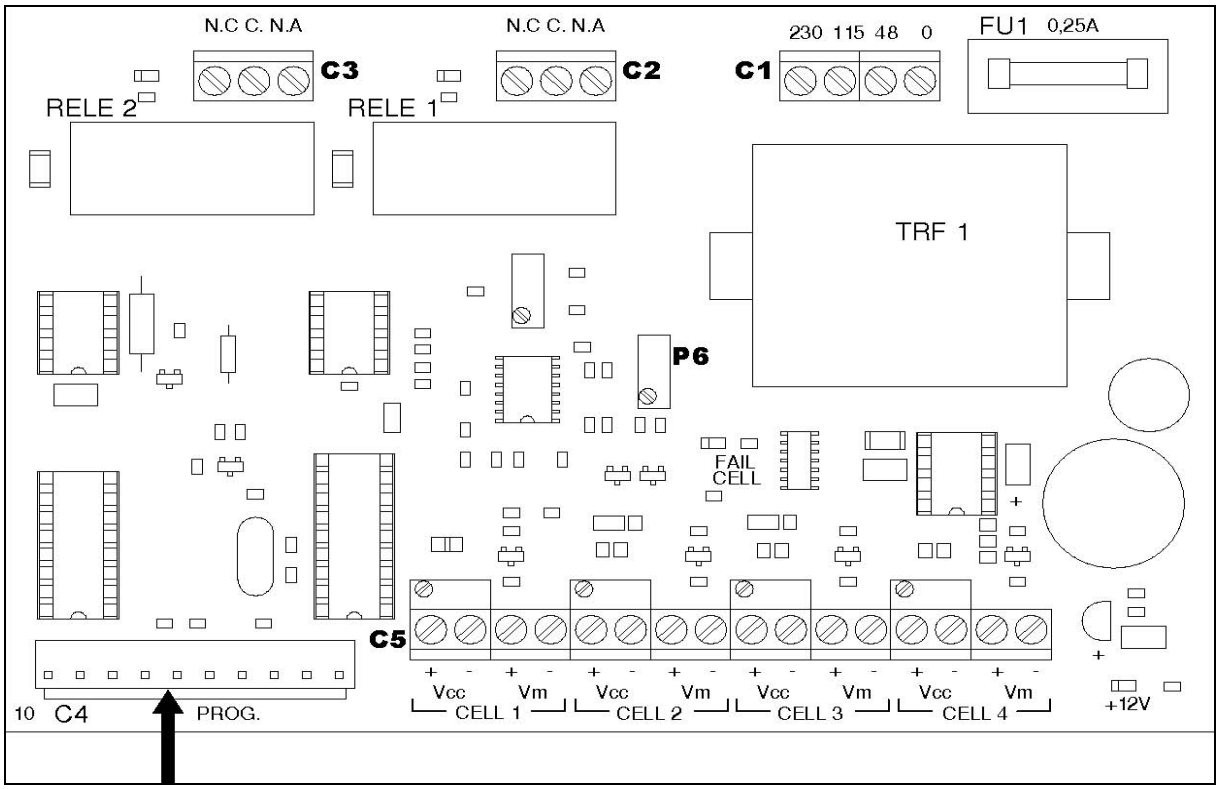


Fig. 3.1. Load limiter connections.

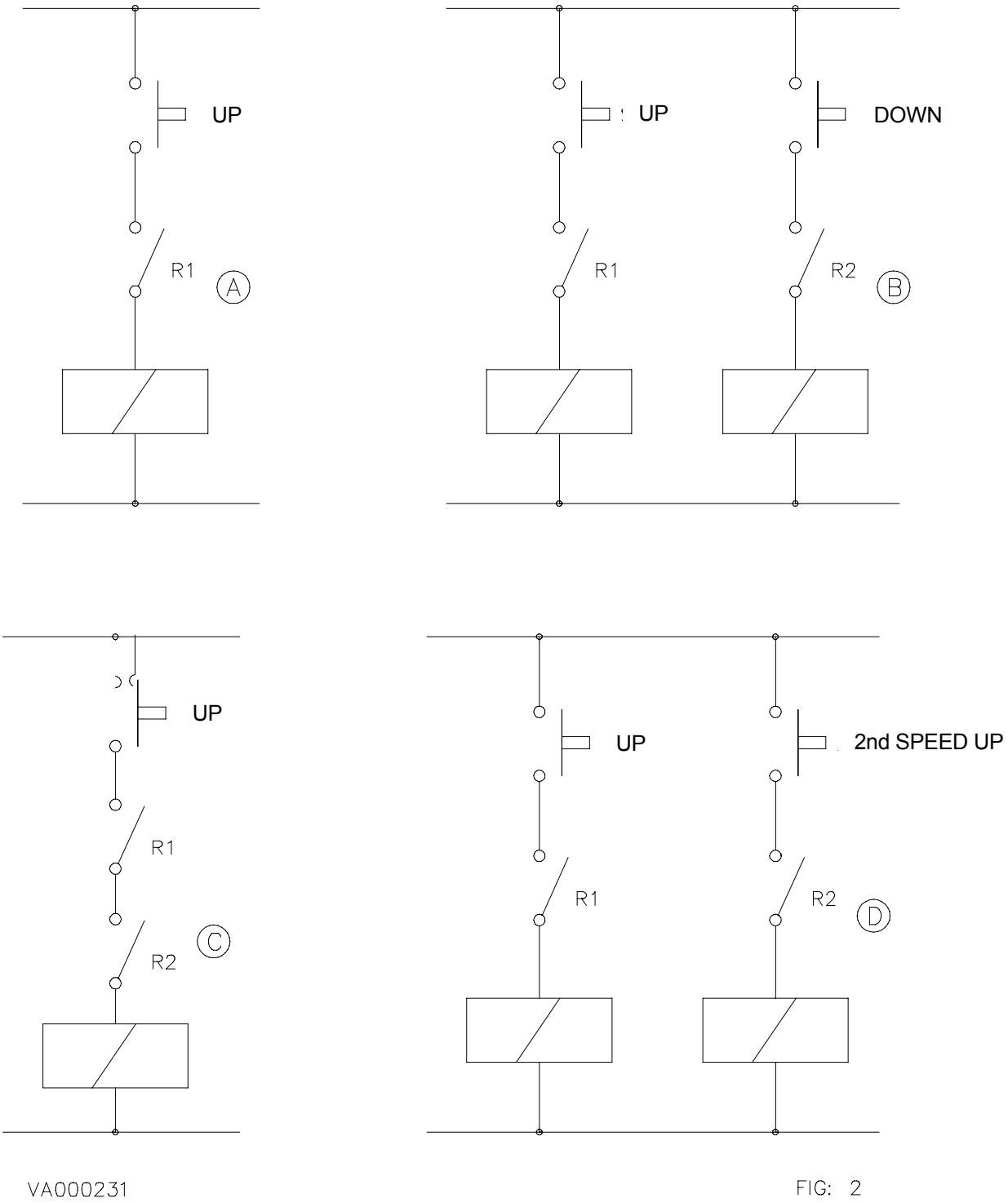


Fig. 3.2. Load limiter connection modes.

3.1. CONNECTION OF CHARGING CELL

Connect the load limiter to the charging cell or cells, as in Fig. 3.1, to the connector **C5:**

(The colours in the brackets correspond to cells with 4 cables)

CELL 1, (CELL 2, CELL 3, CELL 4) *

+ Vm	**GREEN** (WHITE)
- Vm	**WHITE** (GREEN)
+ Vcc	**BROWN** (RED)
- Vcc	**YELLOW & BLACK** (BLACK) **+ MESH**

*In case of most than 1 cell.

3.2. POWER SUPPLY

Connect the system to the network at 48, 115 or 230 through connector **C1**.

3.3. RELAY 1 CONNECTION

Connect the relay 1 as in Fig. 3.1, to connector **C2**.

N.C	**Contact close**
C.	**Block**
N.A	**Contact open**

3.4. RELAY 2 CONNECTION

Connect the relay 2 as in Fig. 3.1, to connector **C3**.

N.C	**Contact close**
C.	**Block**
N.A	**Contact open**

4. LS2 LOAD LIMITER SETTING

The load limiter is pre-adjusted in the factory with the values supplied by the customer. However, these values can be changed at any moment in the programming terminal. If you don't have this terminal, you can make the adjustment through the potentiometer P6 as you can see in **Fig. 3.1**. This setting varies every opening and closing tripping of the 2 relays proportionally.

To reset the trip point through the potentiometer, proceed as follows:

- Apply to the crane the weigh with which the limiter has to operate.
- Turn the potentiometer in the opposite direction to clockwise till the relays are disconnected. Taking into account the delay time, in case there is some delay timing.
- Turn the potentiometer in the sense of clockwise till the relay R1 is activated.
- These operations will adjust the trip of relay 1 (normal and timed).

This adjustment procedure is for simple operations of the limiter, for complex operations the adjustment has to be done through the programming terminal.

5. RECYCLING

INFORMATION FOR THE PROPER MANAGEMENT OF REFUSE ELECTRIC AND ELECTRONIC DEVICES (RAEE)

At the end of the lifetime of the system, it should not be mixed with general refuse.

It can be delivered without any cost, in specific collection centres, run by local authorities or dealers providing this service.

Removed separately electronic waste avoids possible negative consequences to the environment, arising from inappropriate disposal and enables treatment and recycling of component materials to obtain significant savings in energy and resources.

To underline the obligation to collaborate with the selective refuse collection, in the product you will find the symbol warning that can not be used the traditional container for the elimination of the system.

For further information, please contact your local authorities.

5.1. PACKAGING

→ Materials used for packaging are recyclable.

→ For their elimination consider the local standards of treatment of these waste materials.