Inkema

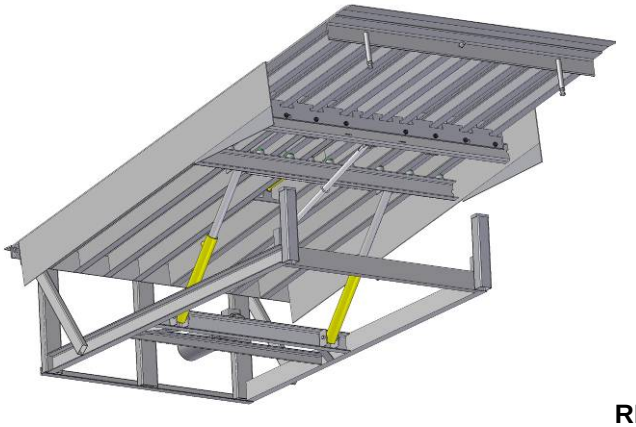
Loading bays • Dock shelters • High-speed doors
Fire doors • Free standing frames and dock houses • Scissor tables
Folding bridges • Industrial doors

*Instructions manual*

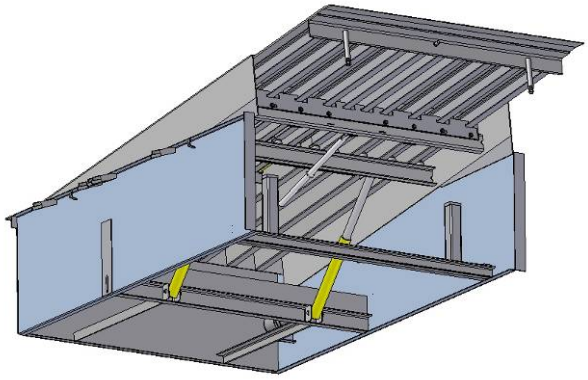
Hydraulic dock leveller

Models: **RH21-RH31 (B) and RH22-RH32 (B)**

# EMBEDDED AND SELF-SUPPORTING



**RH21-RH31 (B)**



**RH22-RH32 (B)**

# Contents

# 01 – Introduction

This manual is a guide for the correct and safe installation, use and maintenance of the **RH21 - RH31 (B) and RH22 - RH32 (B)** dock levellers.

Compliance with the instruction set forth herein ensures the long life of the machine and respect for the safety guidelines prevents the most common work or maintenance-related accidents.

The instructions in this manual do not, in themselves, guarantee safe working and do not release operators from their obligation to observe the safety code, legislation or local or national regulations.

The service rule set out in this manual is only valid for mobile ramps and for loading and unloading trucks.

In the event of mislaying the instructions and maintenance manual, another copy that is specific for the machine should be requested. It is essential and absolutely necessary to keep this manual with the machine, in order to consult it at any time, or settle any doubts regarding its use.

The manufacturer has no direct control over the operations, locations or maintenance of the machine. Operators are responsible for using best safety and maintenance practices.

Operators have the obligation to read and make sure they understand this manual before they use the machine.

Using the machine with caution and adequate training not only protects the operator but also the persons who depend on his work.

The information set out in the manual is valid at the time of publication.

The photographs and drawings are generic; as a result, this information may be changed, due to the constant development and research carried out by ***INKEMA.***

In the event of discrepancy, please consult the technical department.

The manual is an inseparable part of the machine and must be kept together with it in the event of sale.

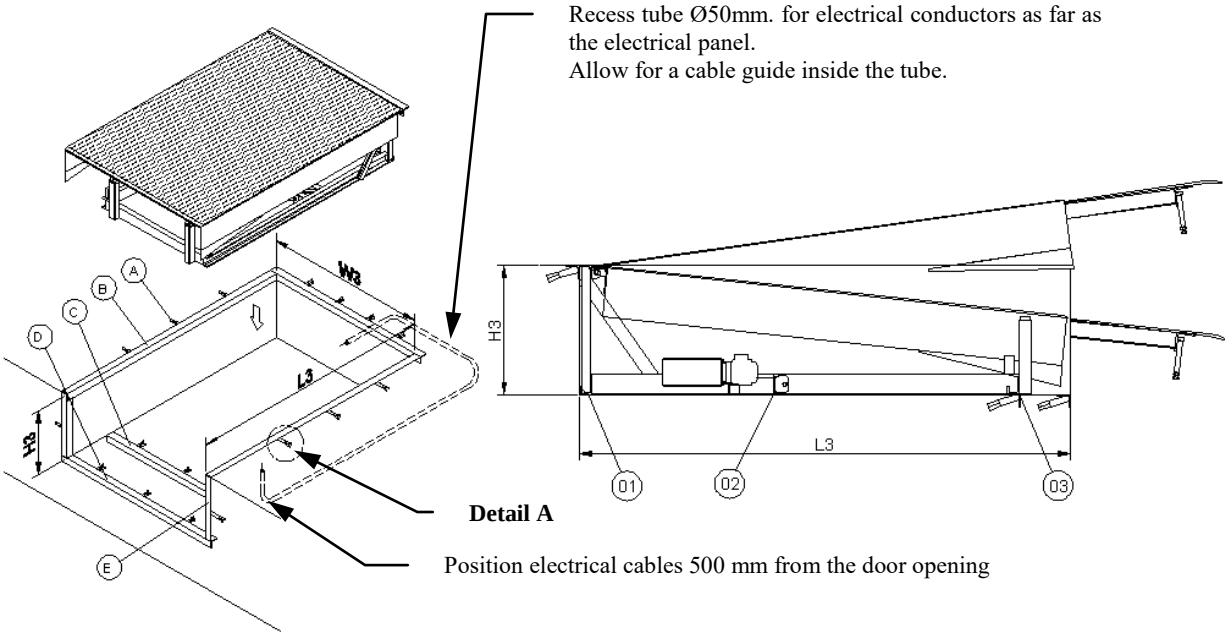
# 02 – Technical specifications

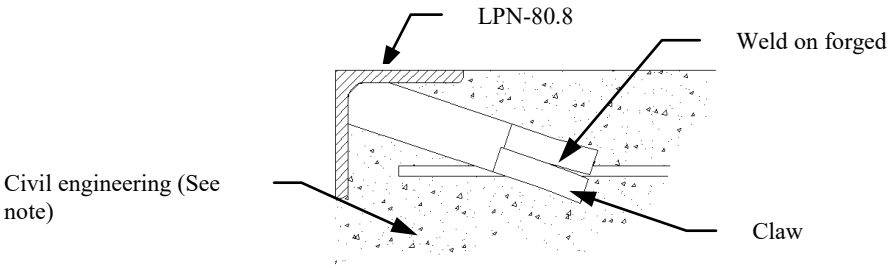
Ramp designed pursuant to the **UNE-EN 1398** standard
Calculated for a maximum nominal load of: (See its plate characteristics)

## 02.01 – Usage conditions and limits

- Nominal load capacity 6t
- Motor electrical voltage 230/400 volt. 3F 50Hz
- Motor electrical power 1.1 Kw.
- Electrical output voltage to emergency electro valve 24 volt. AC.
- Max. operating pressure of the hydraulic circuit 140 kg/cm² (Bar)
- Operating temperature range (-10ºC +40ºC)
- Noise level generated <70db
- Max. transit speed 10Km/h
- Max. operating gradient 12.5% (7º)
- Do not work with the machine while the emergency stop is activated or if the power supply has been cut off.

## 02.02 – RH21 – RH31 (B) embedded pit




Detail A of subframe

**Note**: Metal profile joints with continuous cord and a neck of 6mm
Floor of at least H250 concrete with a thickness greater than or equal to 200mm

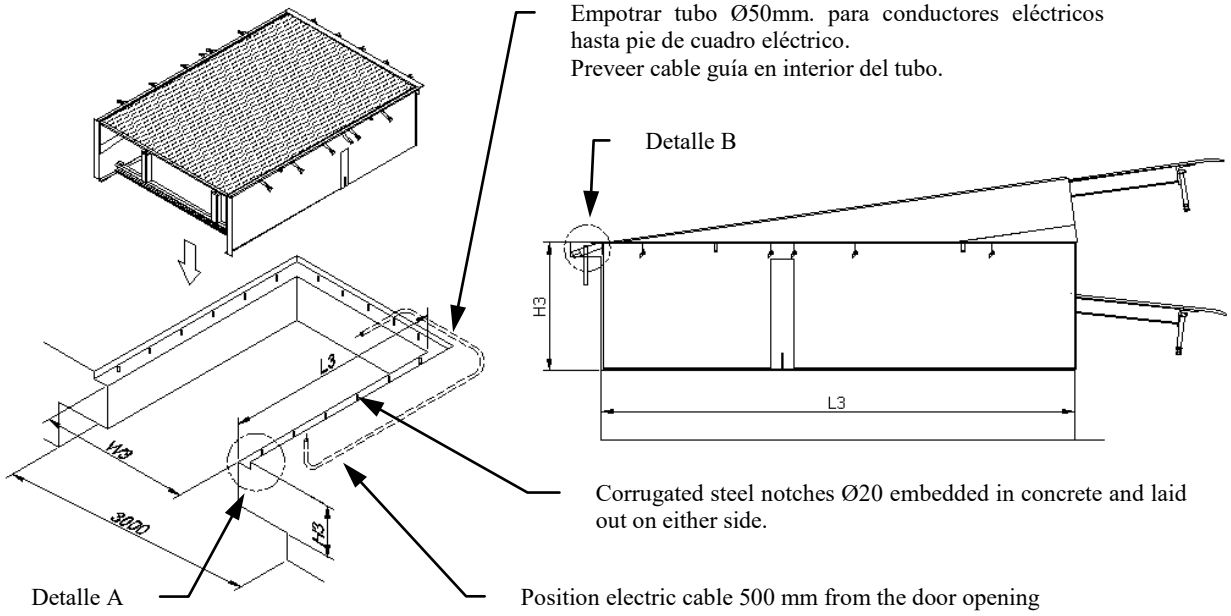
**PIT FRAME**

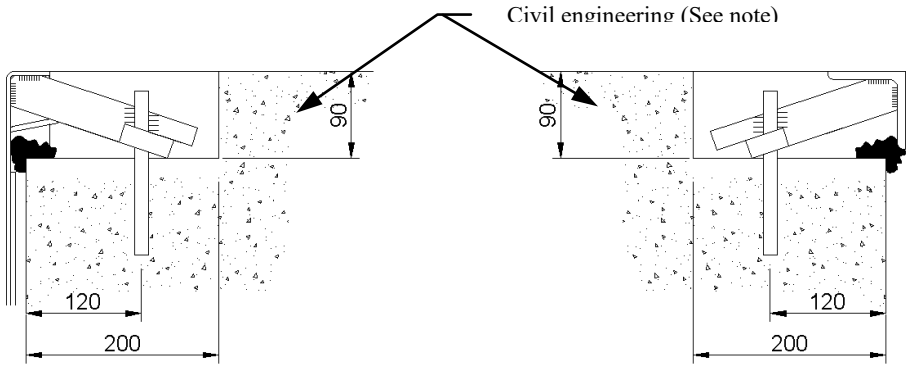
| A | B | C | D | E |
|---|---|---|---|---|
| 15 un. ** | 2 un. | 1 un. | 2 un. | (1+1) Un. ** |
| #3x40x200 | LPN-80.8 x (L3 – 10) | LPN-80.8 x (W3) | LPN-80.8 x (W3 + 160) | LPN-80.8 x H3 |

(**) Parts with some type of machining (Ask the Technical Department for drawings)

The diagonals of the pit must be equal ± 5 mm

## 02.03 – RH22 – RH32 (B) self-supporting pit




Detail A Detail B

Note: Metal profile joints with continuous cord and a neck of 6mm
Floor of at least H250 concrete with a thickness greater than or equal to 200mm

## 02.04 – Platform

- Superior tear plate (thickness 8/10mm.), quality ST-37.
- Cold rolled "L-shaped" profiles with a thickness of 3mm.
- 2 cold rolled lateral profiles (non-shear safety panels).
- Rear hinge unit (platform joint).
- Safety bar for executing maintenance work.

## 02.05 – Lip

- Tear plate (thickness 13/15mm.), quality ST-37.
- Press stroke 5º 150mm. from the end (for perfect adjustment to the truck).
- Milled at the end (to ease the passage of the fork-lift trucks).

## 02.06 – Bedplate

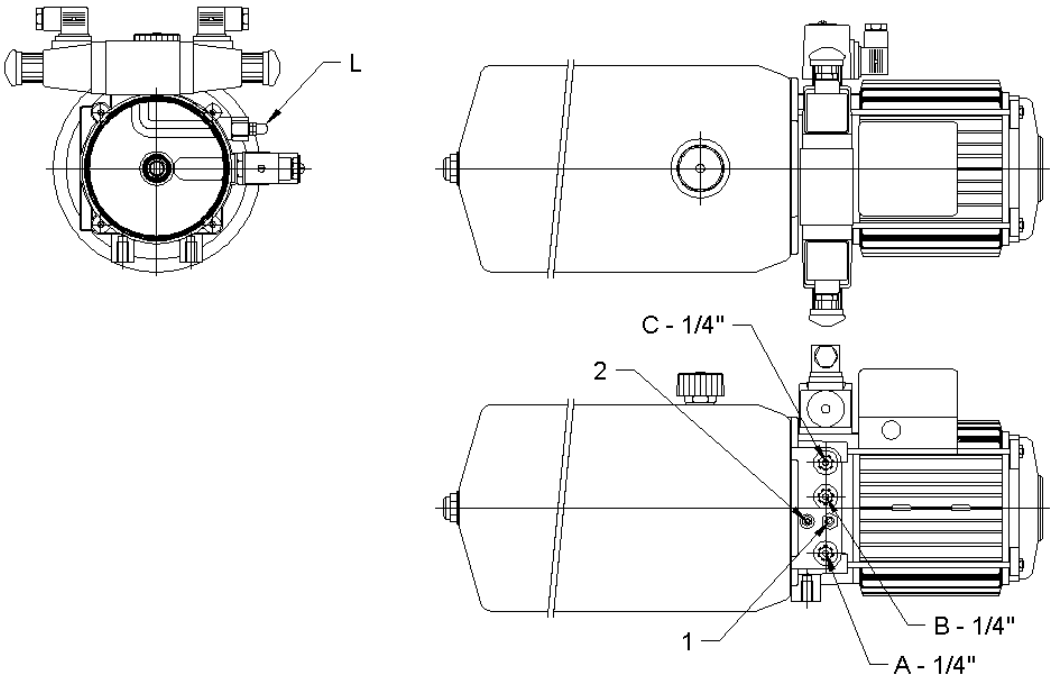
- Rear assembly (head) formed by rolled profiles.
- Front assembly with profiles for supporting the lip.
- 4mm reinforced plate sides in the cylinder beam area.
- Rear and lateral lips for securing the machine to the concrete.

## 02.07 – Hydraulic power unit

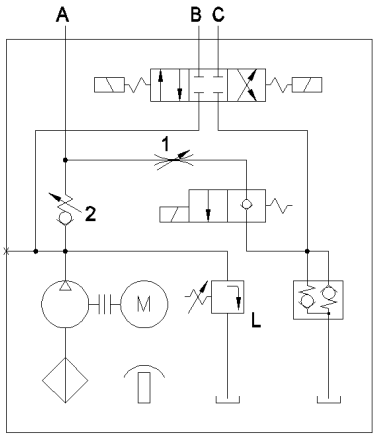
- 1.5CV electric motor. 230/400Volt 3F 50Hz.
- Hydraulic pump with flowrate of 5 litres/minute
- 7-litre tank.
- Logicblock where all the elements are incorporated (including 24V electro valves).
- 2 Ø50mm. cylinders with rod for raising platform, with parachute safety valve.
- 1 Ø30mm. cylinder with rod for the lip movement.
- Leads

The machine may be supplied with any of the following hydraulic unit versions, both are identical and perform the same function.

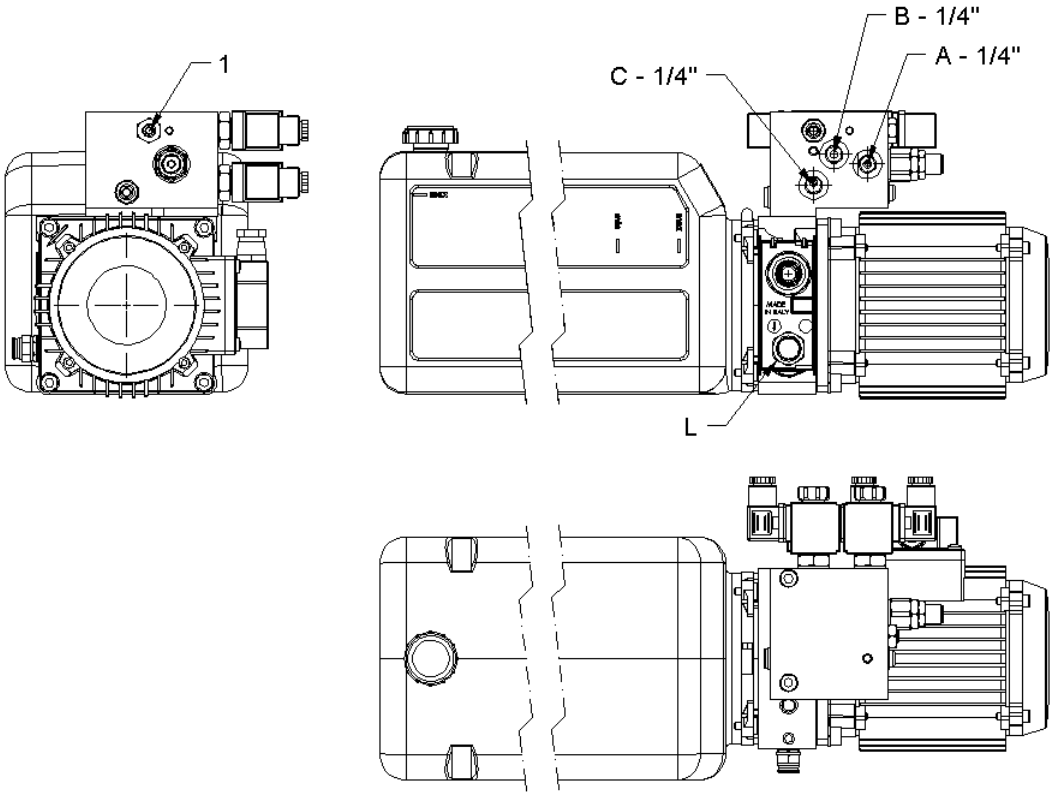
### 02.07.01 – Hydraulic unit version 03



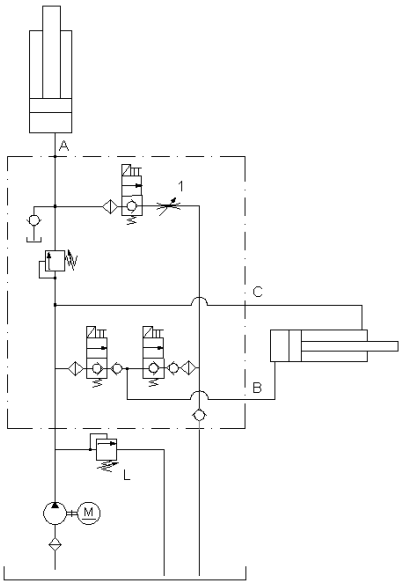

| | |
|---|---|
| 1 | Leveller regulation |
| 2 | Lip regulation |
| A | Lift cylinder |
| B | Lip cylinder (open) |
| C | Lip cylinder (close) |
| L | Limit valve |



### 02.07.02 – Hydraulic unit version 03




1 Leveller regulation
A Lift cylinder
B Lip cylinder (open)
C Lip cylinder (close)
L Limit valve




## 02.08 – Electrical control panel

- (See electrical control panel connections, page 16)
- Transformer for manoeuvring circuit at 24Volt. AC.
- Green light indicating on.
- Emergency stop/section switch.
- Thermal switch.
- Fuses.
- Terminal block.
- Box 230X*310Y*140Z (IP-55)

## 02.09 – Safety systems

- Emergency and/or power failure electro valve
- Emergency stop/section switch.
- Elevation cylinder safety valve
- Toe guards
- Non-slip surface

## 02.10 – Maintenance

The correct operation and long life of the ramp depend largely on the preventive maintenance work carried out.

Advanced maintenance may only be carried out by the ***INKEMA*** technical service or staff authorised by the latter.

This maintenance is carried out to ensure that the product conserves the safety and usage characteristics it had when it was first installed.

All changes, repairs or manipulation of the product that fail to comply with these regulations will lead to the cancellation of the one-year warranty term and the liability of ***INKEMA*** for the product will automatically end.

Continuous greasing, painting and vigilance is the best way to guarantee its performance for many years.

### 02.10.01 – Hydraulic oil

The hydraulic oil must be replaced every two years.

The oil must contain agents that prevent the formation of foam, oxidation and water absorption. If the winter temperatures are very low, the oil must not be too thick and its viscosity index must remain stable at low temperatures.

Never mix different oils, as the new oil may have a different resistance to oxidation and affect the life of the original oil.

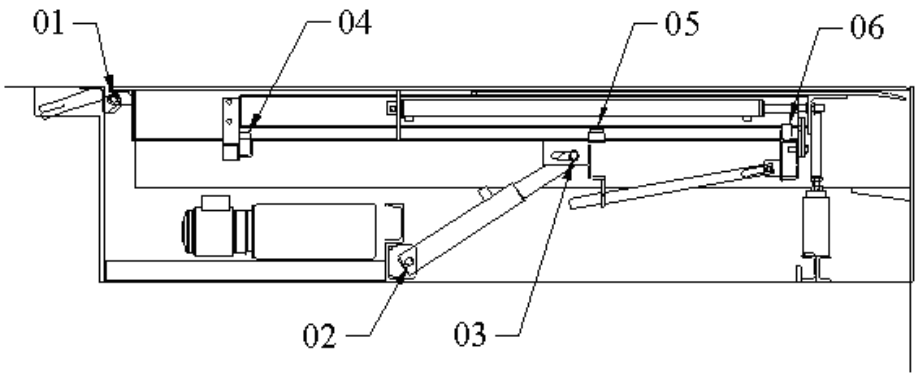
It is important to check the oil level every 6 months. The oil tank must be filled until it almost overflows from the closing cap, in the lowest possible position.

The machine is supplied already containing **T-15 oil**

Hydraulic oil for ramps in refrigerated storerooms must have specific properties of use, in accordance with the temperatures to which it is exposed. For this reason, if the need arises, the manufacturer must be informed about the conditions in which the machine will be operating to ensure it contains the special oil.

### 02.10.02 – Greasing points

Every six months, check the grease points shown in the diagram, points 01, 02 and 03 of the rear axles and elevation cylinder, and points 04, 05 and 06 of the different retractable lip sliding skids:



### 02.10.03 – Dock leveller descent speed regulation

The speed will be regulated using the respective adjuster (1). *(See hydraulic unit, page 6)*

### 02.10.04 – Lip opening speed

The lip opening/closing speed is determined in the factory, but can be regulated using the respective adjuster (2). *(See only hydraulic unit version 00, page 6)*

### 02.10.05 – Maintenance plan

| Maintenance job | Daily | Every month | 6 months | 1 year | 2 years |
|---|---|---|---|---|---|
| General state of the machine | ♦ | ♦ | ♦ | ♦ | ♦ |
| Greasing | | | ♦ | ♦ | ♦ |
| Hydraulic oil level | | | ♦ | ♦ | ♦ |
| Oil leak inspection | | | ♦ | ♦ | ♦ |
| Weld inspection | | | | ♦ | ♦ |
| Axle inspection | | | | ♦ | ♦ |
| Inspection of lateral adhesive bands | | | | ♦ | ♦ |
| Paint inspection | | | | ♦ | ♦ |
| Flexible conduits and connection fittings | | | | ♦ | ♦ |
| Manoeuvring speed | | | | ♦ | ♦ |
| Check parachute valve | | | | | ♦ |
| Change hydraulic oil | | | | | ♦ |

## 02.11 – Instructions of use for the standard panel

### 02.11.01 – Before use

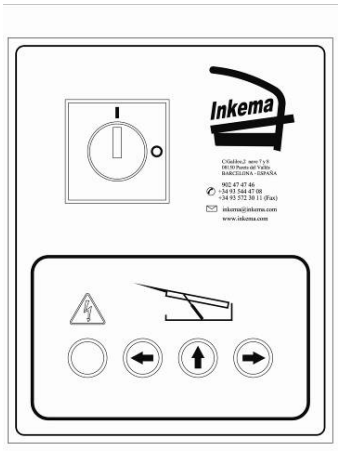
Make a visual check to ensure the leveller is in perfect conditions of use.

Centre the vehicle against the rubber stops of the leveller.

Check that the vehicle is completely immobilised and blocked. (Stop the engine, apply the handbrake and apply chocks to the wheels).

To raise the machine to the load surface level:

- Connect the manoeuvring circuit by turning the red switch at the top. The green pilot light will come on.
- Press ⬆ until the truck height has been exceeded. If you stop pressing the button, the leveller will descend at a controlled speed, due to its own weight.
- Immediately press ⬅ to extend the lip; the leveller will rise a little and the lip will be extended.
- Stop pressing all buttons and let the leveller descend at a steady speed until it rests on the load surface of the truck.




Check that the lip is resting on the vehicle load surface on a surface NO SMALLER than 130mm. along the whole width of the lip.

### 02.11.02 – During use

The dock leveller will merely rest on the load surface (truck). The hydraulic cylinders MUST NOT be blocked to allow the leveller to adapt to the height of the load surface (which will vary, depending on the variation in the truck suspension).

Check that the emergency stop is NOT activated and that the leveller is supplied with power.

**VERY IMPORTANT:**
**It is strictly prohibited to perform loading and unloading operations with the emergency stop activated, or while the leveller is not supplied with power.**

Never exceed the maximum nominal load. (See its plate characteristics).

Ensure that the leveller continues to rest on the load surface during transit. If this is not the case, press the emergency stop button immediately.

Fork-lift trucks must be driven with caution. The maximum transit speed calculated for the leveller is 10 km/hour.

### 02.11.03 – After use.

Raise the leveller and close the lip before the truck leaves the loading position. To do this, proceed as follows:

- Press the button ➡, the leveller will rise to a height that is sufficient to clear the truck. Continue pressing until the lip has been completely withdrawn.
- Press the button and wait for the leveller to descend at a steady speed and is resting on its supports on the bedplate.

### 02.11.04 – Precautions during use.

Check that the emergency stop is not activated and that the leveller is supplied with power.

Never exceed the maximum nominal load. (See its plate characteristics).

Before each manoeuvre check that no-one is in the work area.

Check that the leveller is resting properly on the load surface of the truck, with the entire lip coupled to a surface of approximately 130 mm along its whole width.

The hydraulic unit has the sole function of making the necessary movements to manipulate only the dock leveller. It must never be used to support and/or lift loads.

Before raising the device ensure that its movement is not blocked by other equipment. (Doors, etc...

On completing the operation, check that the lip is correctly inserted into the platform.

# 03 – CE Declaration

## DECLARATION OF CONFORMITY

**INKEMA SISTEMAS, S.L.** declares, under its own responsibility, that the electro hydraulic dock levellers:

Make : **INKEMA**
Model: : **RH21-RH31 (B)** and **RH22-RH32 (B)** with a capacity of **6000 Kg**(*)
Year of manufacture : **2013**

Are compliant with the essential requirements of the following directives:

| | |
|---|---|
| **2006 / 42 / EC** | Machine safety. |
| **2004 / 108 / EC** | Electromagnetic compatibility. |
| **2006 / 95 / EC** | Low voltage. |

And have been calculated and designed pursuant to the following European standards:

| | |
|---|---|
| **EN 1398:1998** | Dock levellers |
| **EN 292-2:1991** | Machine safety. Basic concepts. General design principles. |
| **EN 61000-6-2:2001** | Electromagnetic compatibility. Basic immunity concepts for industrial environments. |
| **EN 61000-6-4:2001** | Electromagnetic compatibility. Basic emissions concepts in industrial environments. |
| **EN 60204-1:1997** | Machine safety – Electrical equipment – General provisions. |

*(*) In the event that the capacity is other than 6000kg, the respective EC certificate will be attached to this manual.*

# 04 – Machine units and parts

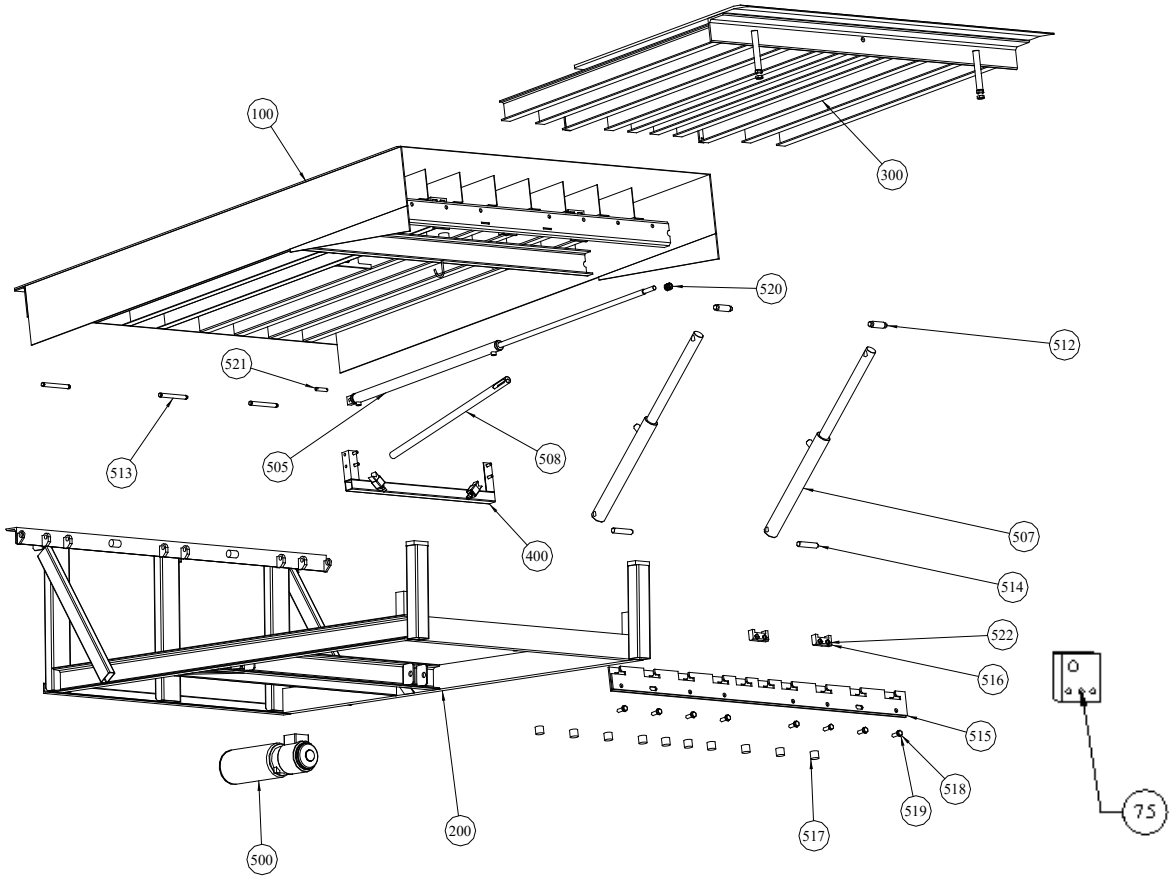



**Fig. 1**

| Pos. | Part code | Description | Quant. |
|---|---|---|---|
| 075 | 20.0018.0002 | Standard retractable electrical control panel | 1 |
| 100 | 20.0001… (*) | Leveller structure | 1 |
| 200 | 20.0002… (*) | Leveller bedplate | 1 |
| 300 | 20.0003… (*) | Retractable lip | 1 |
| 400 | 20.0021.0089 | Skids assembly unit and accessories | 1 |
| 500 | 20.0017.0005 | 400v 3F 1.5cv 1500rpm 3.3cc/v power unit with 7-litre tank | 1 |
| 505 | 30.0010 … (*) | Retractable lip cylinder | 1 |
| 507 | 30.0010 … (*) | Leveller elevation cylinder | 2 |
| 508 | 30.0006.0003 | Maintenance bar Ø35-Ø31x950 | 1 |
| 512 | 30.0006.0059 | Zinqued axle for mounting hole Ø30x103 | 2 |
| 513 | 30.0006.0007 | Zinqued rear hinge axle Ø19 x 175 | 3 |
| 514 | 30.0006.0011 | Zinqued axle for cylinder Ø25x120 | 2 |
| 515 | 30.0009.0126 | Machined plate supporting retractable lip | 2 |
| 516 | 30.0019.0030 | 20x50x90 machined polyamide skid assembly | 2 |
| 517 | 30.0019.0031 | Polyamide skid Ø40x35 | 10 |
| 518 | 30.0012.0198 | Zinqued M16x50 DIN-933 screw | 8 |
| 519 | 30.0012.0037 | Zinqued M16 DIN-125 washer | 8 |
| 520 | 30.0012.0145 | Zinqued M20 DIN-936 nut | 2 |
| 521 | 30.0006.0008 | Zinqued axle Ø16 x 70 | 2 |
| 522 | 30.0012.0088 | M10x50 DIN-912 screw | 4 |
| 523 | 30.0012.0191 | Zinqued M10 DIN-125 washer | 4 |

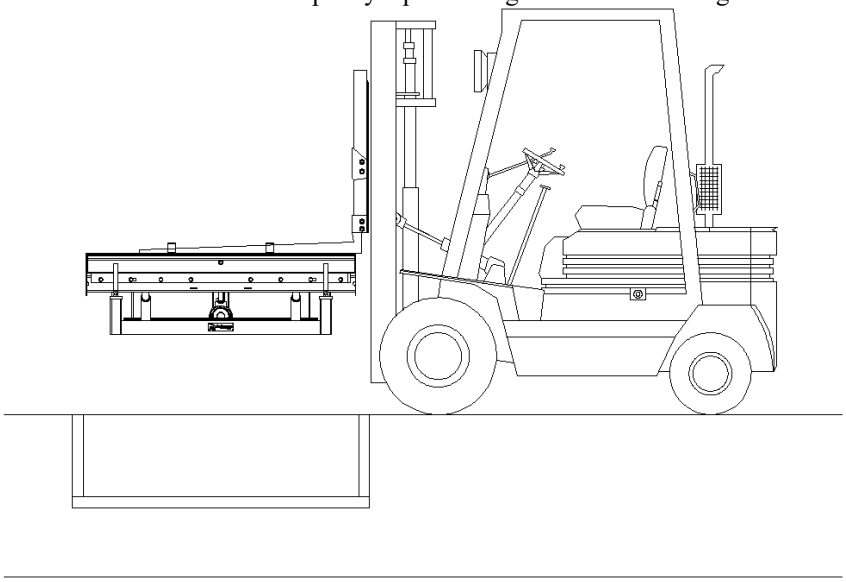
(*) Specify the part code and description, and the machine model, dimensions and load.

# 05 – Installation

## 05.01 – Positioning in the pit

**VERY IMPORTANT**: When handling the leveller, always respect the occupation risk prevention legislation and the regulations regarding safety, hygiene and health at work.

Place it in the pit with the help of a crane, fork lift truck or similar element, using the worm screws, and chains, slings and similar items to lift it. With a load capacity equal to or greater than the weight of the leveller



Then unwind the electrical cable and pass it through the tube that is centred at the back the pit. Once the cable has emerged at the other end of the tube, position the leveller correctly in the pit.

## 05.02 – Securing the leveller in the pit

### 05.02.01 – Securing in the case of a embedded leveller.

Once the leveller is in the pit, check the following:

The separation between the sides of the leveller and the pit must be exactly the same at the front and back of it.

In the event of the separation not being equal in the pit, this must be at the rear part and not at the sides.

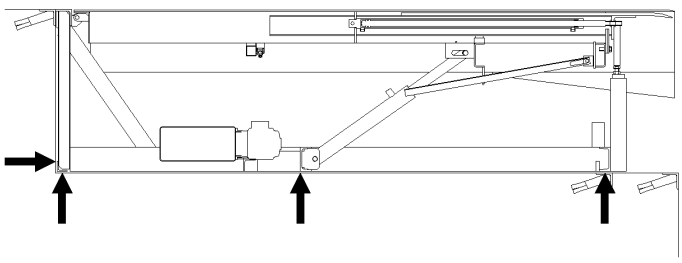
Considering that the height of the pit is usually about 10mm. more than the height of the leveller it is essential to support the leveller base with plates or similar elements until the leveller is flush with the loading bay. The support points are those marked with the arrows in the following diagram:

Place at least the following levelling plates in position:

- 2 at the front of the machine (which must coincide with the weld cords).
- 3 at the rear of the machine which must coincide with the bedplate head pipes.
- 1 at each cylinder application point.

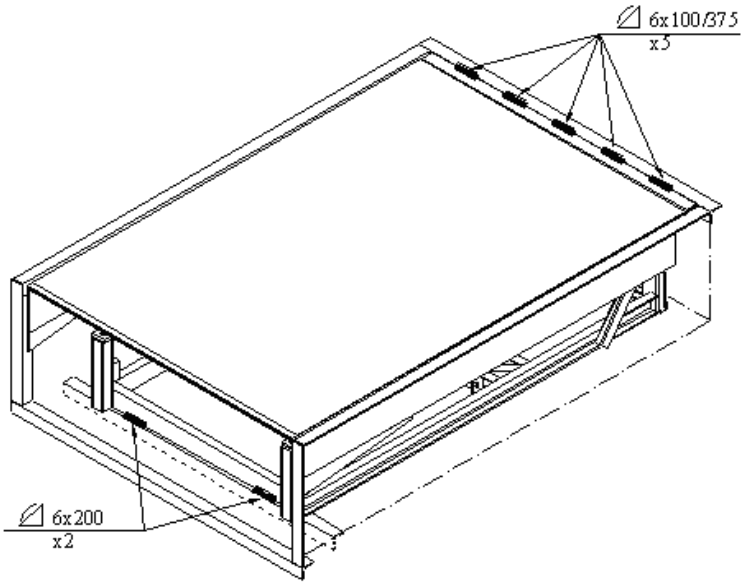
Then weld the plates to the leveller and weld the ramp to the recessing subframe, as indicated:

Block it against the wall, if necessary.



The welding areas are indicated in the following diagram:

- 2 weld cords with a throat of 6mm. and length of 200mm. coinciding with the points where the lip is supported on the front of the machine.
- 5 weld cords with a throat of 6 mm. and length of 100mm., distributed and separated by 375mm at the rear part.




### 05.02.02 – Securing in the case of a self-supporting bedplate

Once the leveller is in the pit, check the following:

The separation between the sides of the leveller and the pit must be exactly the same at the front and back of it.

In the event of the separation not being equal in the pit, this must be at the rear part and not at the sides.

These spacers have the mission of NOT allowing the sides of the bedplate to close against the mobile leveller, due to the pressure exerted when concreting the paving in the premises; if this should occur, it would cause a serious problem in the subsequent functioning of the machine.

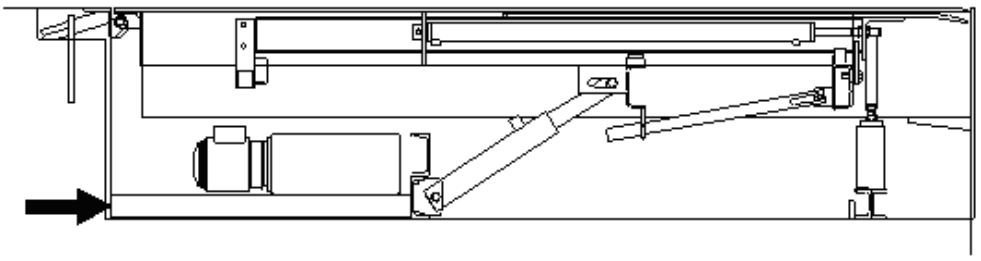
The anchoring hooks are in a pack supplied with the machine.

Distribute 5 hooks at the rear, 3 or 4 at each side (depending on the machine length) and 2 at each pipe at the front.

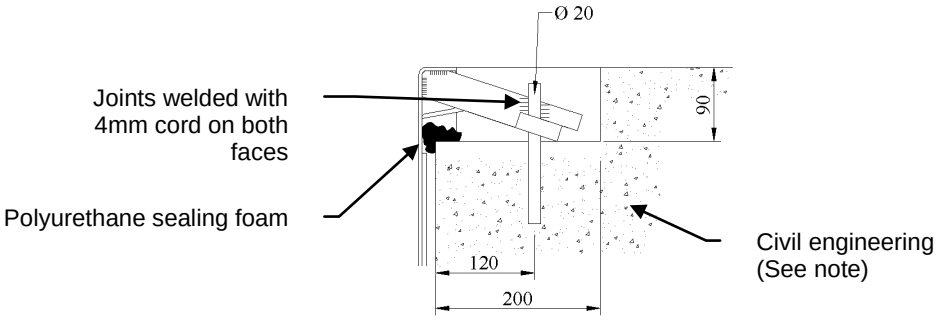
Weld one end to the profile of the bedplate and the other end to the reinforced concrete notch.

Weld one end to the profile of the bedplate and then seal the sides with polyurethane foam.

It is important for the machine to have a rear support that coincides with the two LPN as shown in the following figure with the symbol (➡):



Once all the fish tails are welded, seal the sides with polyurethane foam so that the concrete cannot penetrate into the existing space. The platform will be ready for creating the formwork of the final paving in the loading bay.




**Note**: Floor of at least H250 concrete with a thickness greater than or equal to 200mm. Filling of perimeter with at least H250 concrete.

## 05.03 – Installing the electrical control panel

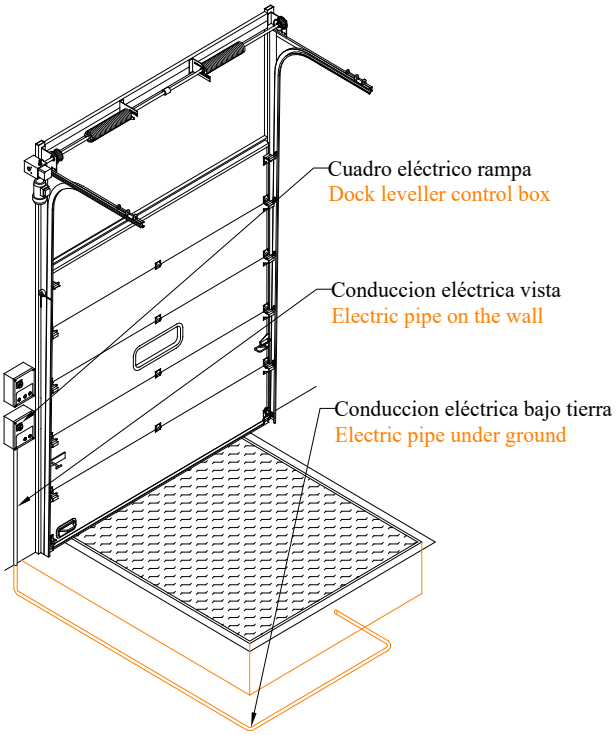
The electrical panel must be installed in the wall on the truck driver side, to allow the dock leveller operator to see and talk to the driver if necessary. (See *control panel connections, page 16)*

Secure the electrical panel box to the wall at the desired height and perfectly aligned with the output of the leveller cables, approximately 1300mm from the floor.

Adjust the tube for the electrical cables to pass through at the existing distance between the panel and floor.

Secure the tube to the wall (using at least 3 brackets); it must be perpendicular to the loading bay floor and aligned with the leveller output cables.

The plastic tube is delivered sealed to one of the two sides of the leveller bedplate.




Once everything is secured, pass the cables through and connect, pursuant to the attached electrical diagram which is inside the electrical control panel. *(See electrical control panel connections, page 16)*

## 05.04 – Completed installation

Eliminate the front strips joining the lip to the bedplate.

**VERY IMPORTANT:** Weld the lateral panels, removing the rivet that holds them in place and check their movement and functionality.

Lastly, check the condition of the leveller paint, correcting any flaws (including the levelling plates).

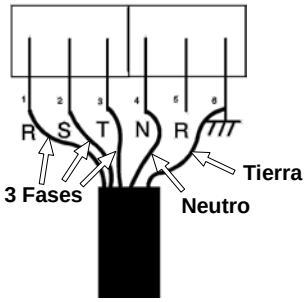
The installation is considered completed when the installer authorised by ***INKEMA*** has filled in the respective installation control sheet.

## 05.05 – Electrical control panel connection

Before installing the automatisms, check that the power supply is disconnected

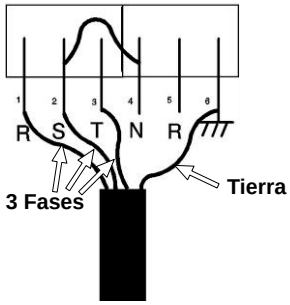
### 05.05.01 – Connecting the power input

**3-phase 380 V connection**



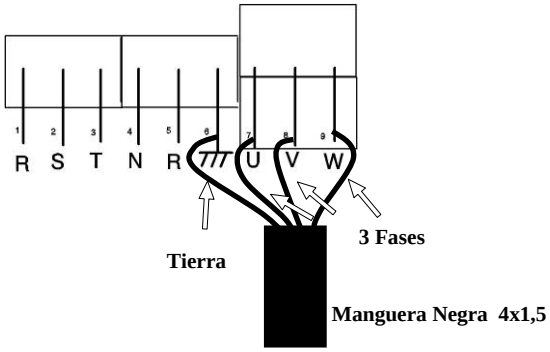

**Manguera Negra 5x1,5**

**3-phase 220 V connection**



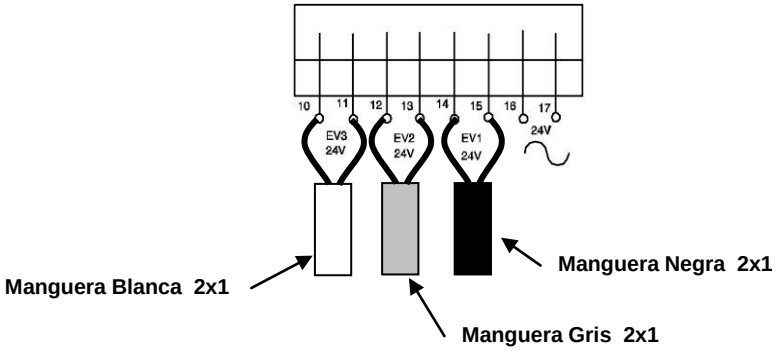

**Manguera Negra 4x1,5**

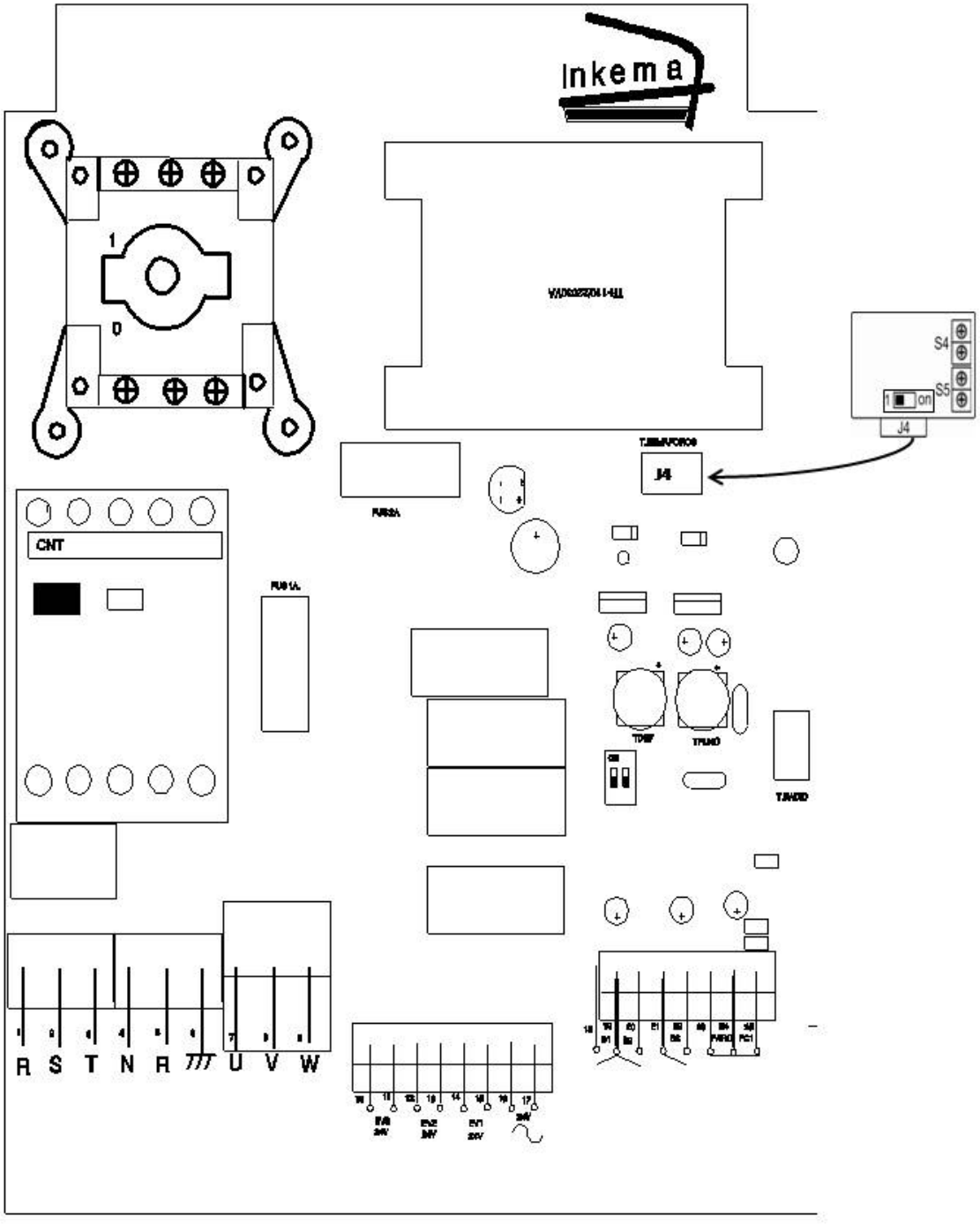
### 05.05.02 – Motor input connection




**Note:** check the rotation direction and change to the U-V-W motor output (if not correct)

### 05.05.03 – Electro valves connection




Inkema
S4
S5
on
J4
CNT
R S T N R U V W

### 05.05.04 – Description of the connection terminals

| | Power |
|---|---|
| 1 | Power input R 380V ac |
| 2 | Power input S 380V ac |
| 3 | Power input T 380V ac |
| 4 | Neutral power input 220Vac |
| 5 | Power input R 380Vac |
| 6 | Ground |
| 7 | U pump motor output |
| 8 | V pump motor output |
| 9 | W pump motor output |
| 10 | EV3 Close Lip 24V ac electro valve |
| 11 | EV3 Close Lip 24V ac electro valve |
| 12 | EV2 Open Lip 24V ac electro valve |
| 13 | EV2 Open Lip 24V ac electro valve |
| 14 | EV1 safety electro valve 24V ac |
| 15 | EV1 safety electro valve 24V ac |
| 16 | 24V 250ma output |
| 17 | 24V 250ma output |

| | Manoeuvre |
|---|---|
| 18 | S1 N.O. button |
| 19 | Common to buttons S1 and S2 |
| 20 | S2 N.O. button |
| 21 | Common to button S3 |
| 22 | S3 N.O. button |
| 23 | N.C. stop button<br>Connection between 23 and 24 if not used) |
| 24 | Common to stop and FC1 |
| 25 | FC1 N.C. limit switch<br>(Connection between 24 and 25 if not used) |
| S4 | RETURN BUTTON |
| S5 | DOWN BUTTON |

***Note***: N.O., Normally Open
N.C., Normally Closed

### 05.05.05 – Selection of actions, operating mode

Select the type of operation using the micro switches.

| | |
|---|---|
|  | RETRACTABLE leveller mode (3 push buttons) |
|  | RETRACTABLE leveller mode, automatic return (4 push buttons) |
|   Micro switch in card of Buttons S4 and S5 | RETRACTABLE leveller mode, automatic return + down button (5 push buttons) |

### 05.05.06 – Selection of actions, non-synchronized

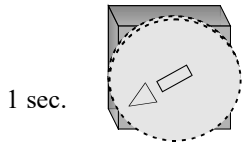
Select the type of operation using the micro switches.

| | |
|---|---|
|  | Non-synchronized timer activated, adjustable time of 1 sec. to 15 sec. |
|  | Non-synchronized timer deactivated, fixed time of 2 sec. |

### 05.05.07 – Timers

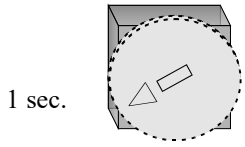
**Leveller raising time:** Regulates the automatic raising time with micro switch nº 1 ON and activating S4.

OPERATING T.




**Non-synchronized time:** Regulates the non-synchronised times between the pump and the lip electro valve.

NON-SYNCHRONISED T.




### 05.05.08 – Operation

The automatism manoeuvres vary, depending on the type of operation selected.

*a) RETRACTABLE LEVELLE type, Man present manual operation*
RAISE (**S1**) activates the pump and deactivates the safety electro valve.
OPEN (**S2**) activates the pump, deactivates the safety electro valve and activates the bay opening electro valve.
CLOSE (**S2**) activates the pump, deactivates the safety electro valve and activates the bay closing electro valve.
**FC1** deactivates the pump.

If no button is activated the safety electro valve remains activated.

*b) Bay with automatic return retractable lip type, semi-automatic operation.*
RAISE (**S1**) activates the pump and deactivates the safety electro valve.
OPEN (**S2**) activates the pump, deactivates the safety electro valve and activates the bay opening electro valve.
CLOSE (**S2**) activates the pump, deactivates the safety electro valve and activates the bay closing electro valve.
AUTOMATIC RETURN (**S4**) activates the pump, deactivates the safety electro valve and activates the bay closing electro valve for the time programmed in OPERATING T.
**FC1** deactivates the pump.

If no button is activated the safety electro valve remains activated.

*c) Automatic return operation + press down*
RAISE (**S1**) activates the pump and deactivates the safety electro valve.
OPEN (**S2**) activates the pump, deactivates the safety electro valve and activates the bay opening electro valve.
CLOSE (**S2**) activates the pump, deactivates the safety electro valve and activates the bay closing electro valve.
AUTOMATIC RETURN (**S4**) activates the pump, deactivates the safety electro valve and activates the bay closing electro valve for the time programmed in OPERATING T.
DOWN (**S5**) activates the safety electro valve and is connected when released.
**FC1** deactivates the pump.

If any button is released, the safety electro valve is **not** reconnected, unless DOWN (**S5**) is pressed.

### 05.05.09 – Characteristics

| | |
|---|---|
| Power supply | 24V ac ±10% |
| Fuse | 2Amp. |
| Non-synchronised time | 1 sec. to 15 sec. |
| Automatic Raising Rime | 1 sec. to 30 sec. |
| Operating Temperature | -20º C to +85ºC |

# 06 – Dismantling

## 06.01 – Dismantling an embedded leveller

**VERY IMPORTANT:** When handling the leveller, always respect the occupation risk prevention legislation and the regulations regarding safety, hygiene and health at work.

To dismantle the leveller, it must be in the rest position.

Disconnect from the mains and also disconnect the electrical panel. D ismantle the electrical panel box and electrical conduction tube.

Strap the front of the leveller to prevent it from opening when being handled. To do so, use at least 2 steel flanges of 30x1mm.

Then cut all the welding attaching the leveller to the subframe, at the front and back.

Once the above tasks have been completed, remove the leveller from the pit.

This operation should be made using a crane or similar element, using chains, slings or similar elements to raise it. With a load capacity equal to or greater than the weight of the leveller

## 06.02 – Dismantling a self-supporting leveller

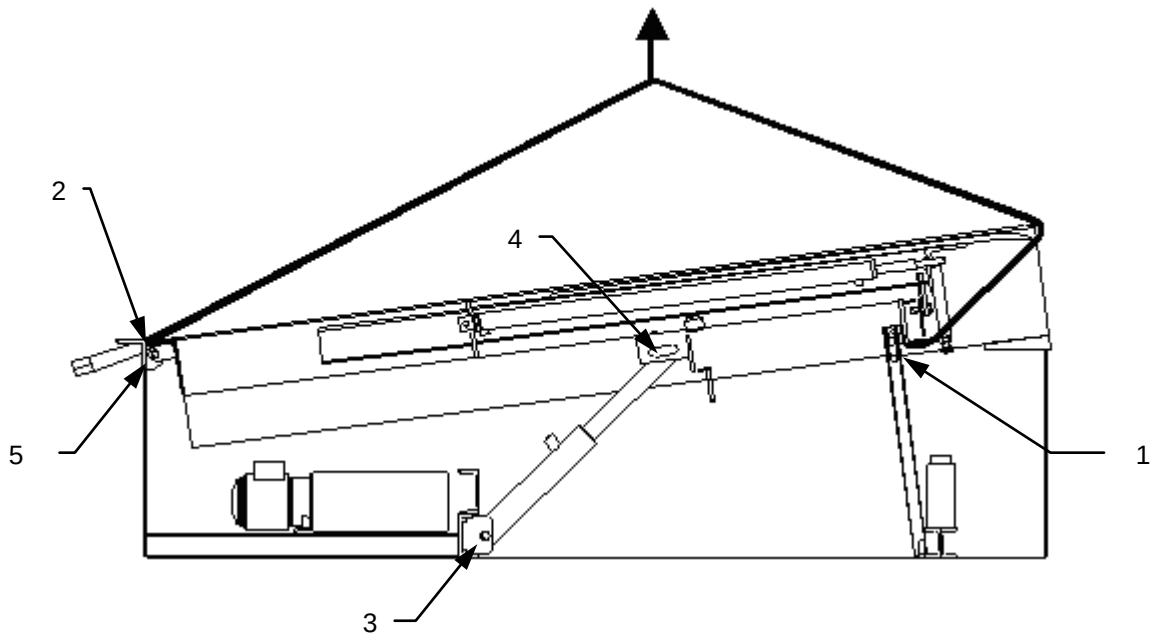
It is important to bear in mind that this type of leveller cannot be dismantled completely as the bedplate is attached to the loading bay paving using formwork.

**VERY IMPORTANT**: When handling the leveller, always respect the occupation risk prevention legislation and the regulations regarding safety, hygiene and health at work.

Proceed as follows:

- With the leveller in the rest position, press the up button. The machine will start to rise. Just before the lip starts to open, press the emergency **STOP** button turning the selection switch to the (0) setting.
- In this position, release the maintenance bar and place it in the operating position.
- Connect the power and press the up/down button (once). Let the machine rest on the bar. Unless selecting the 5 buttons, it will only descend when the down button is pressed.
- Turn off the power.

**VERY IMPORTANT**: Check that the maintenance bar is in the correct position, as the dismantling work must be done inside the machine.



- As an additional safety measure, a sling will be placed on the platform as follows:
  - *At the ends of the lip axle (1) to embrace the back part (2).*
  - *Use chains, slings or similar elements (with a load capacity equal to or greater than the weight of the leveller and keep under voltage, ensuring that the platform is not raised, so as not to block the maintenance lever.*
  - *This operation will be done using a crane or similar element, with a load capacity equal to or greater than the weight of the leveller.*
- Disconnect from the mains and dismantle the electrical control panel and electrical conduction tube.
- Dismantle the elevation cylinders, including the bedplate bolts (3) and the platform bolts (4).
- Dismantle the hydraulic sleeves from the lip cylinders.
- Dismantle the rear hinge bolts (5).
- Once all the bolts have been dismantled, raise the platform.

# 07 – Incidents

**Warning: All checks must be made taking the opportune safety measures:**

- **Do not perform checks when under voltage.**
- **Ensure which voltage is being measured with the multimeter.**
- **All cable connections and disconnections will be made when not under voltage.**
- **Put the safety bar in place whenever it is necessary to work underneath the machine.**
- **Do not test the machine when the operator is underneath it.**
- **Do not push out the lip too much. It could become detached from its housing and cause an accident**

## 07.01 – The panel *DOES NOT* light up

| | |
|---|---|
| **No power** | • Check the input voltage of the panel **R, S, T** and **N**<br>- *There should be 400v between **R** and **S***<br>- *There should be 400v between **R** and **T***<br>- *There should be 400v between **R** and **N***<br>• Check the voltage in the section switch terminal block<br>- *There should be 400v between **R** and **S***<br>- *There should be 400v between **R** and **T***<br>• Check the voltage at the section switch input **L1, L2** and **L3**<br>- *There should be 400v between **L1** and **L2***<br>- *There should be 400v between **L1** and **L3***<br>• Check the voltage at the section switch output **T1, T2** and **T3**<br>- *There should be 400v between **T1** and T2*<br>- *There should be 400v between **T1** and **T3***<br>• Check the voltage in the contactor **2L1, 4L2 and 6L3**<br>- *There should be 400v between **2T1** and **4T2***<br>- *There should be 400v between **2T1** and **6T3*** |
| **The panel does not light up**<br>***Red led*** | • Check that the voltage between **N** and **R** in the terminal block is 230v<br>- *The same voltage should also be present between **N** and **2T1** of the contactor*<br>• Fuse blown<br>- *Check the fuse next to the contactor of **1A**. If it blows after being changed the transformer is burnt. Replace the transformer (transformer swollen or there is a smell of burning)*<br>▪ *Replace the board*<br>- *Fault in board or damaged tracks*<br>▪ *Replace the board* |

## 07.02 – The leveller DOES NOT rise

| | |
|---|---|
| **Voltage or phase failure** | • Check the input voltage of the panel **R, S** and **T**<br>*There should be 400v between **R** and **S***<br>*There should be 400v between **R** and **T***<br>• Check the voltage in the section switch terminal block<br>There should be 400v between **R** and **S**<br>- *There should be 400v between **R** and **T***<br>• Check the voltage at the section switch input **L1, L2** and **L3**<br>- *There should be 400v between **L1** and **L2***<br>- *There should be 400v between **L1** and **L3***<br>• Check the voltage at the section switch output **T1, T2** and **T3**<br>- *There should be 400v between **T1** and T2*<br>- *There should be 400v between **T1** and **T3***<br>• Check the voltage in the contactor **2T1, 4T2 and 6T3**<br>- *There should be 400v between **2T1** and **4T2***<br>- *There should be 400v between **2T1** and **6T3***<br>• Check the voltage at the contactor output in **1L1**, **3L2** and **5L3.** *(activate the contactor manually or with the button)*<br>- *There should be 400v between **1L1** and **3L2***<br>- *There should be 400v between **1L1** and **5L3***<br>• Check that the motor guard has not fused<br>- *The black button should be pushed in and the red one out*<br>• Check the input voltage of the motor guard **1L1, 3L2 and 5L3** *(activate the contactor manually or with the button)*<br>- *There should be 400v between **1L1** and **3L2***<br>- *There should be 400v between **1L1** and **5L3***<br>• Check the output voltage of the motor guard **2T1, 4T2** and **6T3** *(activate the contactor manually or with the button)*<br>- *There should be 400v between **2T1** and **4T2***<br>- *There should be 400v between **2T1** and **6T3***<br>• Check the voltage of the cables from the motor guard to the terminal block. *(activate the contactor manually or with the button)*<br>- *There must be 400v between them*<br>• Check the voltage in the terminal block **U**, **V** and **W** (activate the contactor manually or with the button)<br>- *There must be 400v between **U** and **V***<br>- *There must be 400v between **U** and **W*** |
| **The motor guard shuts** | • Motor guard amperage low. *(Check the motor characteristics plate)*<br>- *Turn the amp adjuster in a clockwise direction to raise the amps.*<br>• Faulty cabling<br>- *Disconnect the **U**, **V** and **W** cables in the contactor and **Motor** and check the cable continuities with the multimeter at each end of the cables*<br>- *Check that the cables are not crossed. Place the multimeter between the following cables (<u>they must be no continuity between them</u>):*<br>▪ *brown and black*<br>▪ *brown and grey*<br>▪ *black and grey*<br>• Shunt to ground<br>- *Place the multimeter between the following cables (there must be no continuity between them):*<br>▪ *ground and brown*<br>▪ *ground and grey*<br>▪ *ground and black*<br>- *There must be no continuity between the motor housing and the motor connections **U**, **V** and **W**.* |

| | |
|---|---|
| **The motor DOES NOT work** | • Check the output voltage **U**, **V** and **W**<br>- *There must be 400v between **U** and **V***<br>- *There must be 400v between **U** and **W***<br>• Check the motor cables and motor connections<br>- *There must be 400v between **U** and **V***<br>- *There must be 400v between **U** and **W***<br>• Check that the motor has not seized up<br>- *Dismantle the fan housing and turn manually*<br>• The contactor does not function<br>- *Check whether there is continuity in the button*<br>- *Check the terminal block connection (terminal **S1**) (18 and 19)*<br>- *Check the safety connection (terminal **FC1**) (24 and 25)*<br>- *If **no** safety element is installed there must be a bridge connection between terminal **FC1** or 24 and 25*<br>- *If a safety device is connected check it is on **NC** (contact closed)*<br>• Check the STOP connection in the terminal block (terminal 23-24)<br>- *Check whether a safety device is connected in the stop terminal or check the bridge connection*<br>• Contactor relay damaged<br>- *Make a visual check on the first relay at the top, it must be activated when pressing the button and the second relay must be deactivated*<br>• Contactor damaged<br>- *Check whether voltage is present in the contactor between **A1** and **A2** m, there must be 230vwhen pressing the button.* |
| **The motor works, but the leveler does not ascend** | • The motor is turning in reverse<br>- *Change 2 motor phases (**U** for **V**)*<br>• The limit valve of the power unit is not correctly adjusted<br>- *Tighten the valve by quarter turns and check* |
| **Lack of hydraulic oil** | • Replenish the hydraulic oil<br>• Hydraulic oil leak (piston or sleeve) |

## 07.03 – The leveller DOES NOT descend

| | |
|---|---|
| **No voltage in the electro valve** | • Check the fuse of **2A** (below the transformer)<br>- *This fuse only protects the electro valves, in order to verify that the transformer is functioning check 24v voltage in the terminal block (terminal 16-17)*<br>• Check the STOP safety in terminals 23-24<br>- *If **no** safety element is installed there must be a bridge connection between terminal 23 and 24*<br>- *If a safety device is connected check it is on **NC** (contact closed)*<br>• Check the output voltage of terminal **EV1** (14-15)<br>- *There must be 24v between terminals 14 and 15 after pressing once (the second relay is blocked)*<br>• Configuration of the 5 button mode micro switches<br>- *Micro switches 1 and 2 of the panel at **ON** and micro switch 1 of the **S4** and **S5** card at **ON*** |
| **Electro valve** | • Cable cut<br>- *Disconnect the cable of terminals **EV1** (14-15) in the electro valve and check the cable continuity*<br>• Check the input voltage of the cowl is 24v ~<br>- *Disconnect the cowl from the coil and check that the input voltage is 24v in alternating current and 24v ± in continuous current at the cowl output*<br>• Electro valve coil<br>- *Check that the coil is magnetising. Remove the coil from the sliding door and insert a screwdriver, under voltage, for 2 or 3 seconds, but **no longer, as the coil will be burned.***<br>• Electro valve in sliding door<br>- *Check that when the electro valve cowl is taken off and replaced, the sliding door can be heard activating and deactivating* |
| **Power unit** | • Lowering regulator too tight or too loose<br>- *If the valve is too tight turn the screw in an anti-clockwise direction (loosen)*<br>- *If the vale is too loose, the piston safety valve could be triggered (tighten)*<br>• Piston safety valve<br>- *Dismantle the piston sleeve and connection fitting and check that the safety valve is not blocked* |

## 07.04 – The lip DOES NOT emerge

| | |
|---|---|
| **No power in the electro valve** | • Check the fuse of **2A** (below the transformer)<br>- *This fuse only protects the electro valves, in order to verify that the transformer is functioning check 24v voltage in the terminal block (terminal 16-17)*<br>• Check the STOP safety in terminals 23-24<br>- *If **no** safety element is installed there must be a bridge connection between terminal 23 and 24*<br>- *If a safety device is connected check it is on **NC** (contact closed)*<br>• Check the output voltage of terminal **EV2** (12-13)<br>- *There must be 24v between terminals 12 and 13 after pressing once (the first and third relays are blocked)* |
| **Electro valve** | • Cable cut<br>- *Disconnect the cable of terminals **EV2** (12-13) in the electro valve and check the cable continuity*<br>• Check the input voltage of the cowl is 24v ~<br>- *Disconnect the cowl from the coil and check that the input voltage is 24v in alternating current and 24v ± in continuous current at the cowl output*<br>• Electro valve coil<br>- *Check that the coil is magnetising. Remove the coil from the sliding door and insert a screwdriver, under voltage, for 2 or 3 seconds, but **no longer, as the coil will be burned.***<br>• Electro valve in sliding door<br>- *Check that when the electro valve cowl is taken off and replaced, the sliding door can be heard activating and deactivating*<br>To perform this operation you can connect the electro valve at 24v (16-17) |
| **Power unit** | • The lip operating adjuster is closed (power unit version 00)<br>- *Open the valve in quarter turns and check*<br>• Hydraulic oil level |
| **Piston** | • Check that the piston and sleeve have no leaks and that the piston is not bent |
| **Lip** | • Lip too stiff<br>- *Dismantle the piston and check whether the lip moves correctly or whether it becomes blocked at some point along the way*<br>DO NOT push out the lip too much. It could become detached from its housing and cause an accident |

## 07.05 – The lip DOES NOT go back in

| | |
|---|---|
| **No power in the electro valve** | • Check the fuse of **2A** (below the transformer)<br>- *This fuse only protects the electro valves, in order to verify that the transformer is functioning check 24v voltage in the terminal block (terminal 16-17)*<br>• Check the STOP safety in terminals 23-24<br>- *If **no** safety element is installed there must be a bridge connection between terminal 23 and 24*<br>- *If a safety device is connected check it is on **NC** (contact closed)*<br>• Check the output voltage of terminal **EV3** (10-11)<br>- *There must be 24v between terminals 10 and 11 after pressing insert lip (the first and fourth relays are blocked)* |
| **Electro valve** | • Cable cut<br>- *Disconnect the cable of terminals **EV3** (10-11) in the electro valve and check the cable continuity*<br>• Check the input voltage of the cowl is 24v ~<br>- *Disconnect the cowl from the coil and check that the input voltage is 24v in alternating current and 24v ± in continuous current at the cowl output*<br>• Electro valve coil<br>- *Check that the coil is magnetising. Remove the coil from the sliding door and insert a screwdriver, under voltage, for 2 or 3 seconds, but **no longer, as the coil will be burned.***<br>• Electro valve in sliding door<br>- *Check that when the electro valve cowl is taken off and replaced, the sliding door can be heard activating and deactivating*<br>To perform this operation you can connect the electro valve at 24v (16-17) |
| **Power unit** | • The lip in regulator is closed (power unit version 00)<br>- *Open the valve in quarter turns and check*<br>• Hydraulic oil level |
| **Piston** | • Check that the piston and sleeve have no leaks and that the piston is not bent |
| **Lip** | • Lip too stiff<br>- *Dismantle the piston and check whether the lip moves correctly or whether it becomes blocked at some point along the way*<br>DO NOT push out the lip too much. It could become detached from its housing and cause an accident |

## 07.06 – The lip enters when you press: take out lip

- The buttons are connected in reverse
  - *Check that the lip out button is connected at **S2** (terminal 19-20) and that **EV2** is activated (third relay)*
- Electro valve cables not correctly connected
  - *Check that the cable activating the electro valve is the correct one (grey cable)*
- Sleeves assembled in reverse
  - *Change the sleeves (the out sleeve must be at the rear of the piston)*

## 07.07 – The lip comes out when you press: lip in

- The buttons are connected in reverse
  - *Check that the lip in button is connected at **S3** (terminal 21-22) and that **EV3** is activated (fourth relay)*
- Electro valve cables not correctly connected
  - *Check that the cable activating the electro valve is the correct one (white cable)*
- Sleeves assembled in reverse
  - *Change the sleeves (the out sleeve must be at the front of the piston)*

## 07.08 – The automatic return mode does not withdraw the machine

- Check that the micro switches 1 and 2 of the board are at ON
- Check the operating time
  - *Regulate the Operating T. power meter*
- Check the connection by pressing S4 in the auxiliary card

# 08 – Contact

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