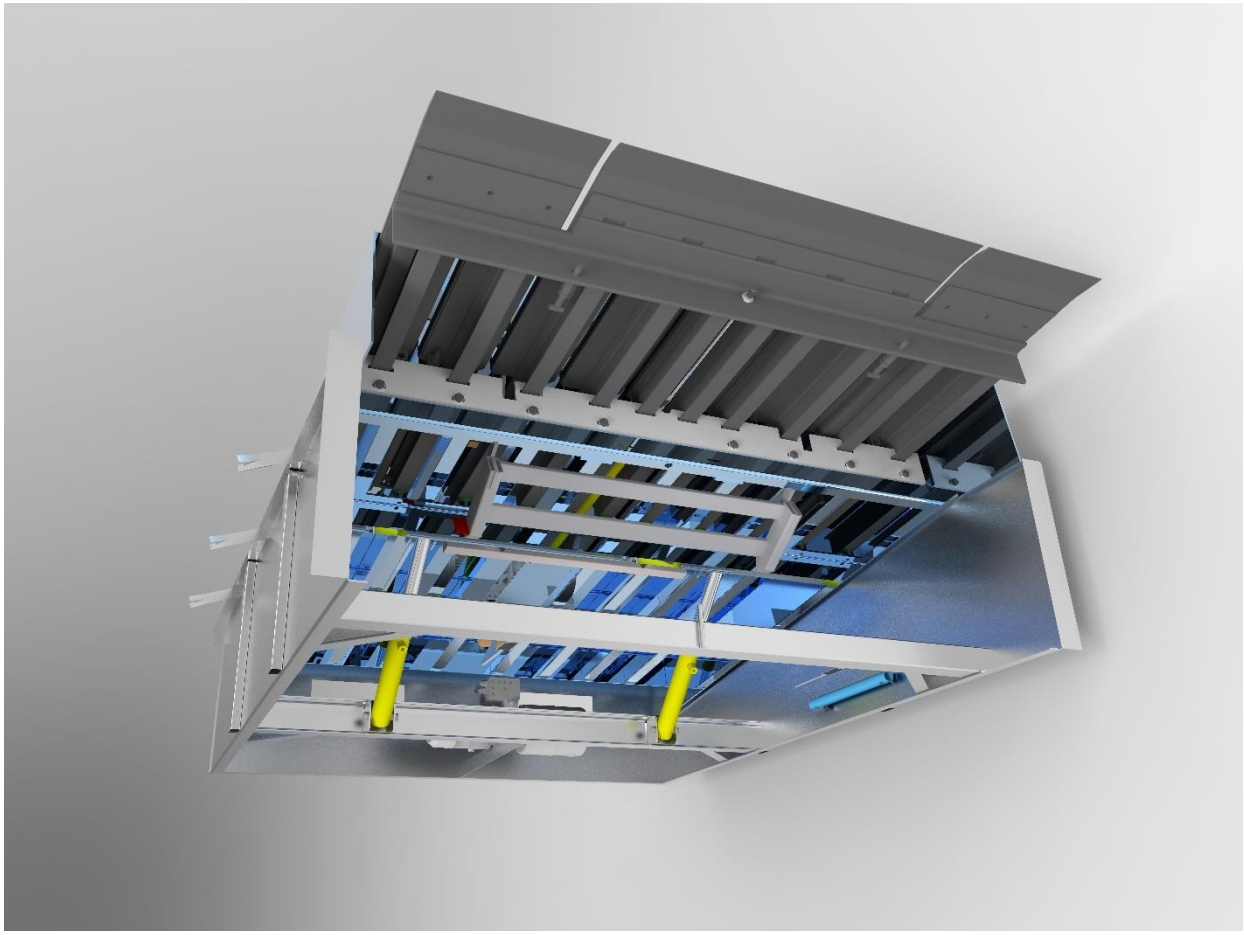
Inkema

Loading Bays • Dock Shelters • High-Speed Doors
Fire Doors • Free Standing Frames and Dock Houses • Scissor Lifts
Loading Bridges • Industrial Doors

Instruction manual
Hydraulic dock leveller

Models: **RH22-RH33 (B)**
with 3 hydraulic lips

BOX MODEL



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01 – Introduction

This manual is a guide for the correct, safe installation, use and maintenance of the dock leveller **RH23 - RH33 (B) with 3 hydraulic lips.**

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.

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

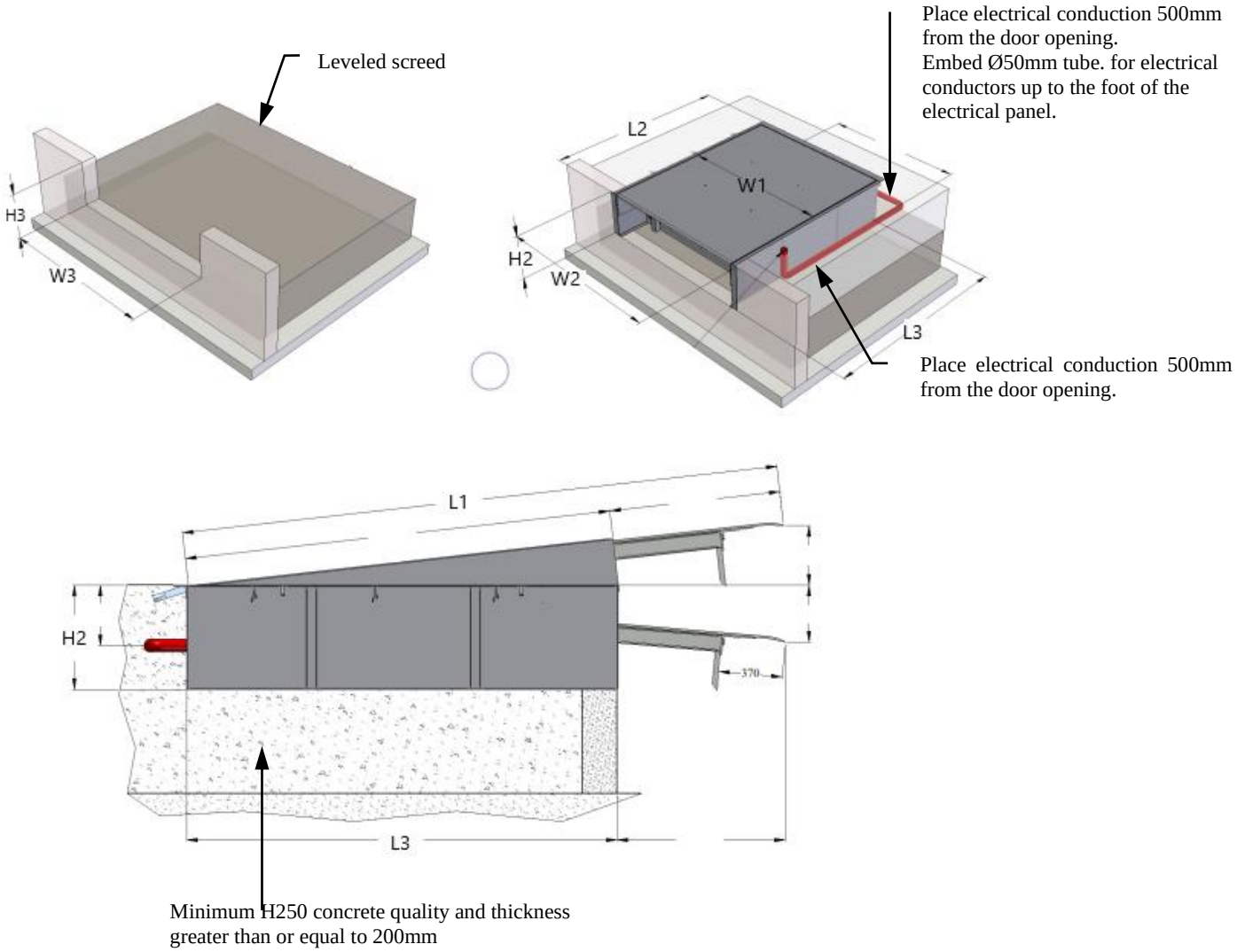
02 – Technical specifications

Leveller designed pursuant to the **EN 1398:2009** standard.
Calculated for a maximum nominal load of: (See its plate characteristics)

02.01 – Usage conditions and limits

- Nominal load capacity 6t
  - *using 3 lips: 6t*
  - *only with the central lip: 3t*
- Motor electrical voltage 230/400 V. 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 – RH23-RH33 (B) Pit



02.03 – Platform

- Superior tear plate (thickness 8/10mm.), quality S235JR.
- 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.

02.04 – 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).

02.05 – Inferior structure

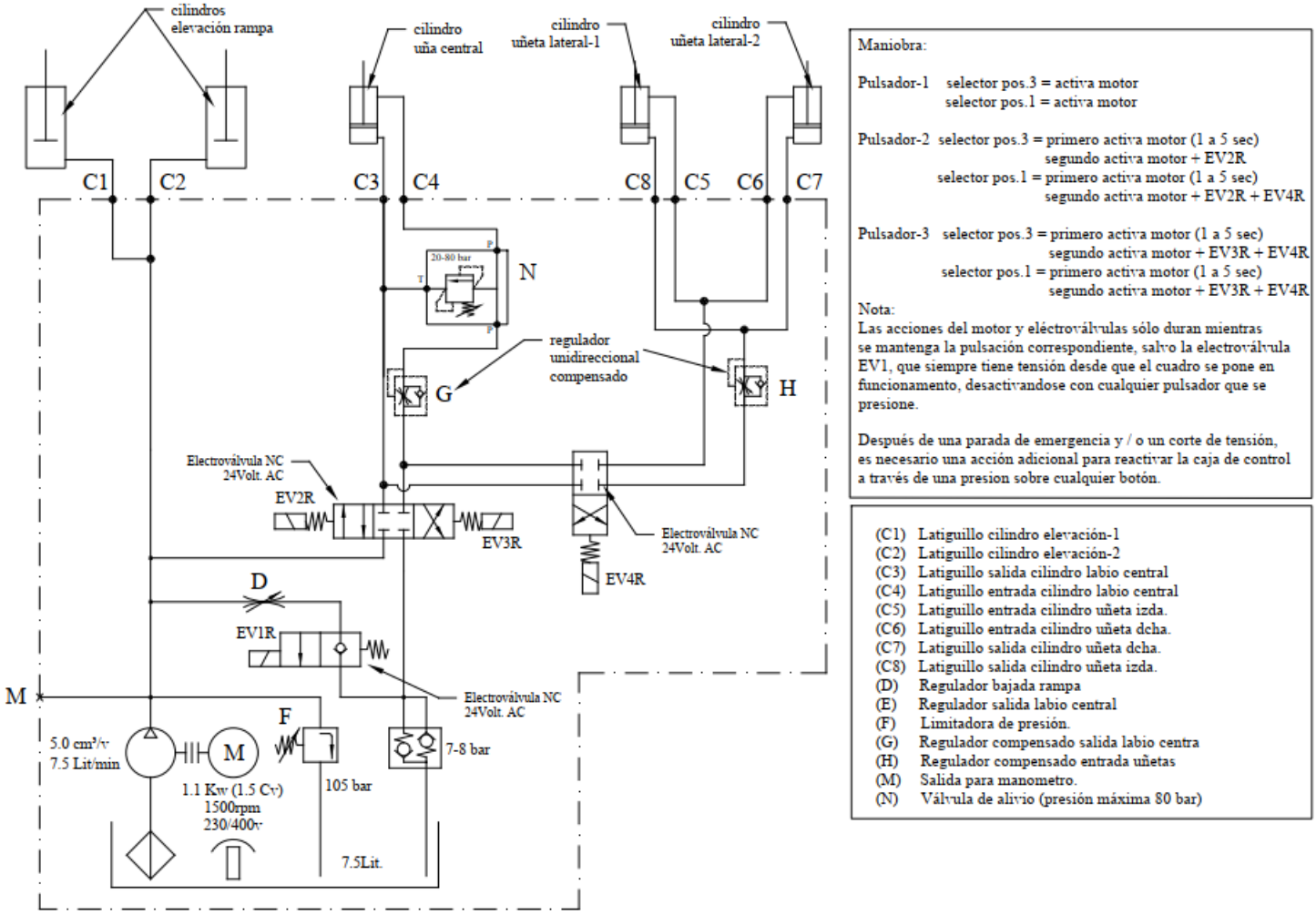
- Rear assembly (head) formed by rolled profiles.
- Front assembly with profiles for supporting the lip.
- 4mm sheet metal sides with reinforcements in the cylinder beam area.
- Rear and lateral lips for securing the machine to the concrete.

02.06 – Hydraulic power unit

- 1.5CV electric motor. 230/400Volt 3F 50Hz.
- Hydraulic pump with flow rate of 5 litres/minute.
- 7-litre tank.
- Block in which all the elements are incorporated (including 24V electro valves).
- 2 Ø50mm. cylinders with rod for raising platform, with parachute safety valve.
- 1 Ø25mm. cylinder with rod for the lip movement.
- 2 double-acting cylinders for hydraulic clamps.
- Leads.

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

02.06.01 – Hydraulic unit



Maniobra:

Pulsador-1 selector pos.3 = activa motor
selector pos.1 = activa motor

Pulsador-2 selector pos.3 = primero activa motor (1 a 5 sec)
segundo activa motor + EV2R
selector pos.1 = primero activa motor (1 a 5 sec)
segundo activa motor + EV2R + EV4R

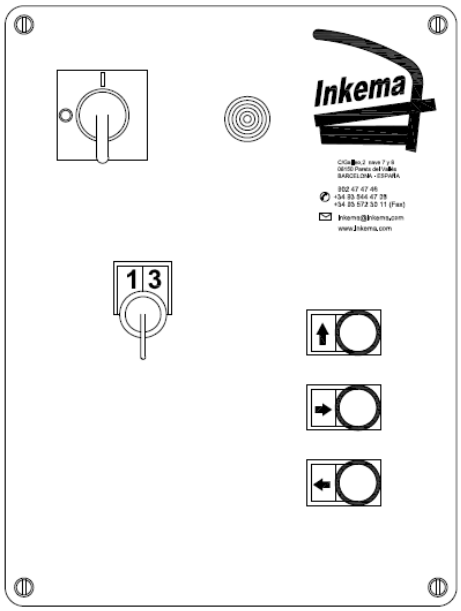
Pulsador-3 selector pos.3 = primero activa motor (1 a 5 sec)
segundo activa motor + EV3R + EV4R
selector pos.1 = primero activa motor (1 a 5 sec)
segundo activa motor + EV3R + EV4R

Nota:
Las acciones del motor y eléctroválvulas sólo duran mientras se mantenga la pulsación correspondiente, salvo la electroválvula EV1, que siempre tiene tensión desde que el cuadro se pone en funcionamento, desactivandose con cualquier pulsador que se presione.

Después de una parada de emergencia y / o un corte de tensión, es necesario una acción adicional para reactivar la caja de control a través de una presion sobre cualquier botón.

(C1) Latiguillo cilindro elevación-1
(C2) Latiguillo cilindro elevación-2
(C3) Latiguillo salida cilindro labio central
(C4) Latiguillo entrada cilindro labio central
(C5) Latiguillo entrada cilindro uñeta izda.
(C6) Latiguillo entrada cilindro uñeta dcha.
(C7) Latiguillo salida cilindro uñeta dcha.
(C8) Latiguillo salida cilindro uñeta izda.
(D) Regulador bajada rampa
(E) Regulador salida labio central
(F) Limitadora de presión.
(G) Regulador compensado salida labio centra
(H) Regulador compensado entrada uñetas
(M) Salida para manometro.
(N) Válvula de alivio (presión máxima 80 bar)

02.07 – Electrical control panel



- (See electrical control panel connections, page 19)
- 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)

02.08 – Safety systems

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

02.09 – 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 two-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.

02.09.01 – 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.

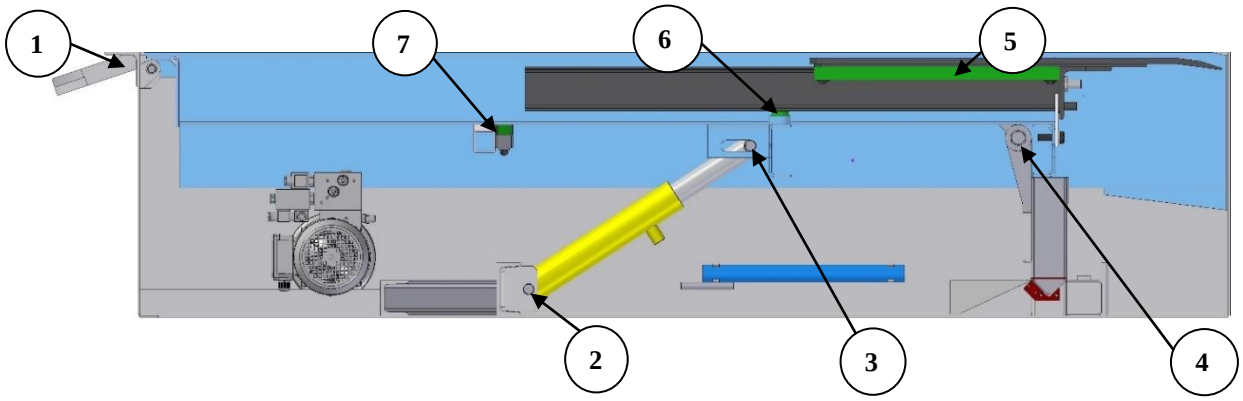
It is important to check the oil level every 6 months. The oil tank must be filled to its maximum level with the machine in the lowest possible position.

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

Hydraulic oil for levellers 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.

02.09.02 – Grease points.

Every six months, check the grease points shown in the diagram, points 01, 02 and 03 of the rear axles and elevation cylinder, legs, and points 04, 05, 06, 07 and 08 of the different retractable lip sliding skids:



02.09.03 – Dock leveller descent speed regulation

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

02.09.04 – Lip opening speed

The lip opening/closing speed is determined in the factory, but can be regulated using the respective adjuster (E). *(See only hydraulic unit version 15, page 6)*

02.09.05 – 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					♦

02.10 – Instructions for use

02.10.01 – Before use

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

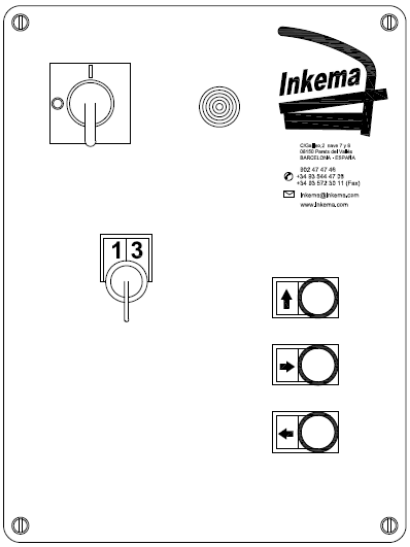
Centre the vehicle against the rubber stops of the leveller.

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.

- Selector use
  Position the sector of the frame a1 / 3 according to what you want to operate with the central claw
  (1) With a maximum load of half the nominal load of the 3t ramp or (3) with the three claws with a maximum load equal to the nominal load of the machine (see ramp nameplate)
- 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 100mm. along the whole width of the lip.

02.10.02 – 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 and depending on whether only one lip or three lips are used (see use of the selector)

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.

02.10.03 – 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 inferior structure.

02.10.04 – 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 use of selector).

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 100 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

Manufacturer, Inkema Sistemas, S.L.
Carretera de Cardedeu, C-251, Km.3
08520 Les Franqueses del Vallès
(Barcelona) Spain

INKEMA SISTEMAS, S.L. declares, under its own responsibility, that the electro hydraulic dock levellers RH2/RH3:

Make : **INKEMA**
Model : **RH23** and **RH33 (B) 3 hydraulic lips** with a capacity of **6000 Kg**(*)

Are compliant with the essential requirements of the following directives:

2006 / 42 / EC	Machine safety directive.
2014 / 30 / EU	Electromagnetic compatibility.
2011 / 65 / EU	RoHS Directive.

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

EN 1398:2009	**EN 349**	**EN 12100:2010**	**EN 13857:2019**
EN 60204-1	**EN 61000-6-2**	**EN 61000-6-3**	**EN 61000-6-4**

The manufacturing process ensures the conformity of the equipment with the technical file.

Compilation of technical file:
Prisco Crespo
Inkema Sistemas, S.L.
Carretera de Cardedeu, C-251, Km.3
08520 Les Franqueses del Vallés
(Barcelona) Spain

(*) In the event of alterations made to this machine without the written approval of Inkema, this declaration of conformity will no longer be valid.

04 – Machine units and parts

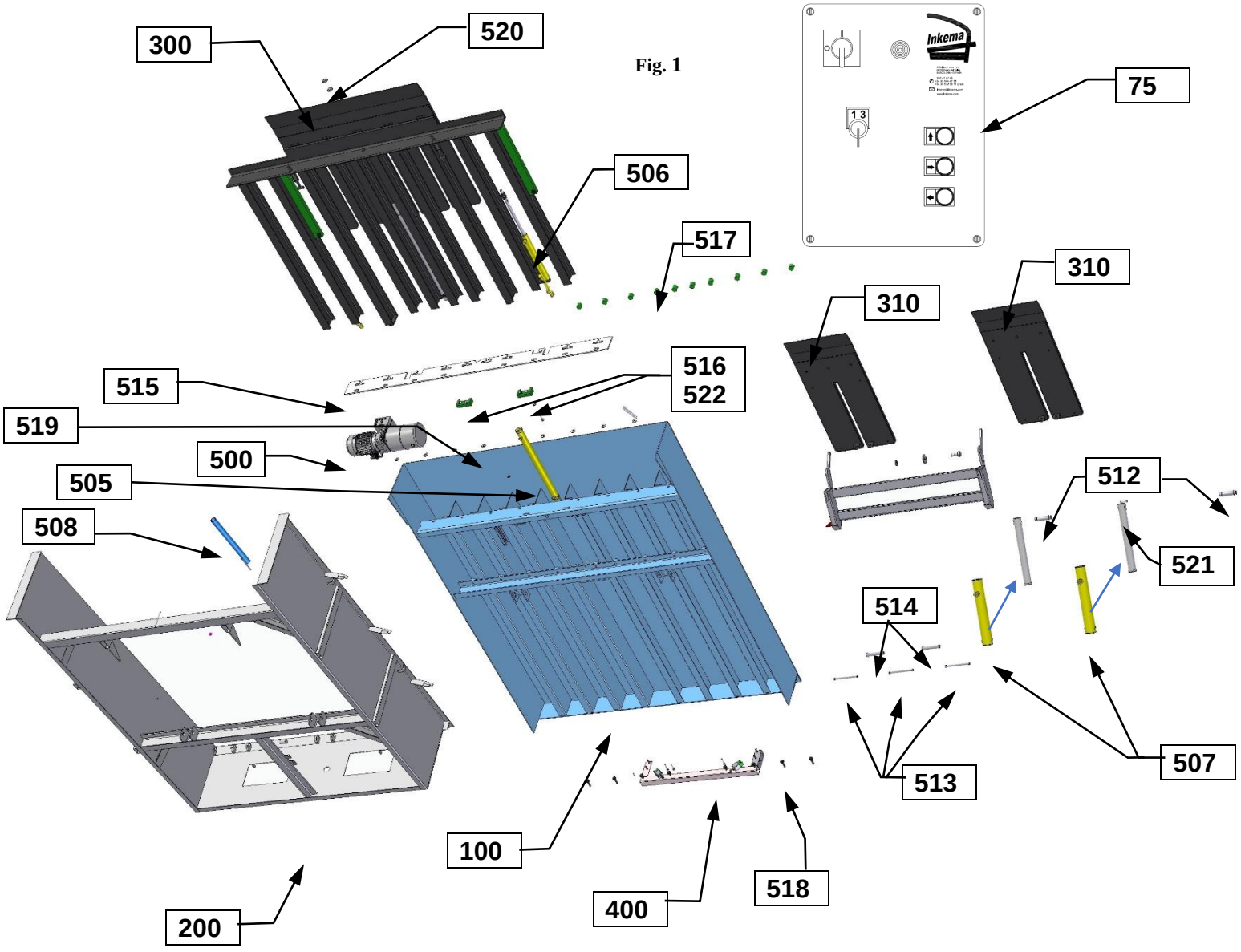


Fig. 1

Pos.	Part code	TC Code	Description	Quant.
75	005802	-	Standard retractable electrical control panel	1
100	*006583	-	Leveller upper structure RH2/3 AB 6T	1
200	*006585	-	Leveller inferior structure RH21/31 or RH22/32 AB	1
300	-	C-003681*	Retractable lip RH2/3	1
310	007429*	P-006893*	Lateral retractable lips RH2/3	2
400	006839	C-000338	Skids assembly unit and accessories	1
500	003398	000707	400v 3F 1.5cv Power Unit with 7-litre tank	1
505	002376*	P-006853*	Ø25 Retractable lip cylinder	1
506	001938	P-000920	RH2-RH3 3 retractable lip cylinder	2
507	001331*	P-000258*	Leveller elevation cylinder	2
508	000989	C-001080	Maintenance bar Ø40x3	1
512	001356	P-000283	Zinqued axle for mounting hole Ø30x103	2
513	001354	P-000281	Zinqued rear hinge axle Ø19 x 175	3
514	001355	P-000282	Zinqued axle for cylinder Ø25x120	2
515	006560*	-	Machined plate supporting retractable lip	2
516	000224	C-000268	RH2B/3B machined skid assembly	2
517	001822	P-000793	Skid Ø40x35	10
518	002759	P-001783	Zinqued M16x50 DIN-933 screw	8
519	001080	P-000004	Zinqued M16 DIN-125 washer	8
520	002761	P-001785	M20 DIN-936 Screw	2
521	001357	P-000284	Zinqued axle Ø16 x 70	2
522	002760	P-001784	Zinqued M10x50 DIN-912 washer	4

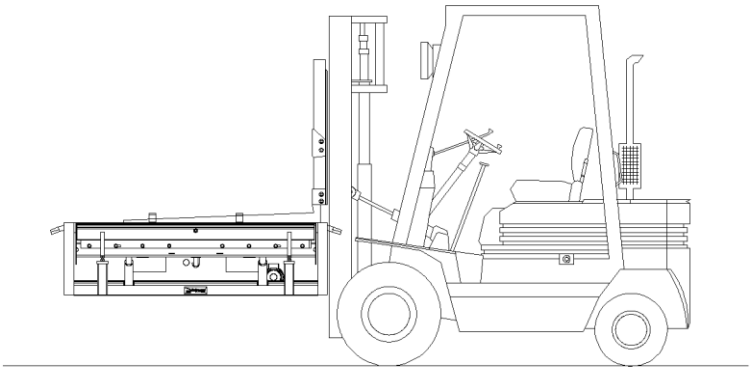
(*) Specify the part code and description, and the machine model and dimension.

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.

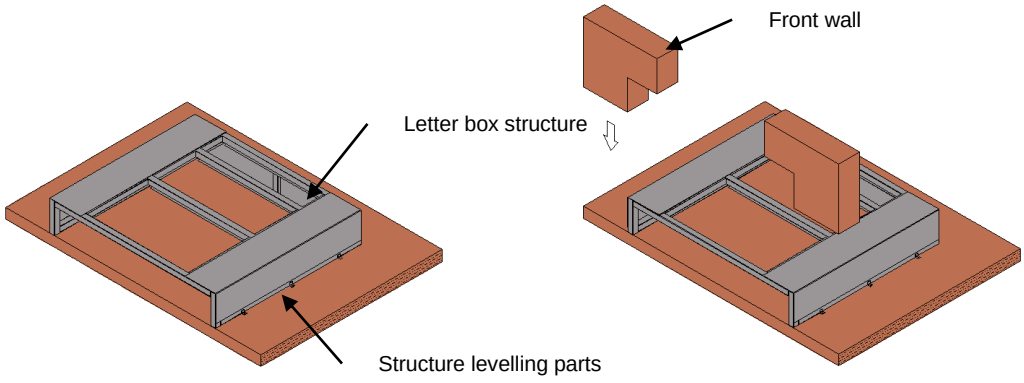
Place it in the pit with the help of a crane, fork lift truck or similar element, using the worm screws, and chains, slings and similar items to lift it. With a load capacity equal to or greater than the weight of the leveller.



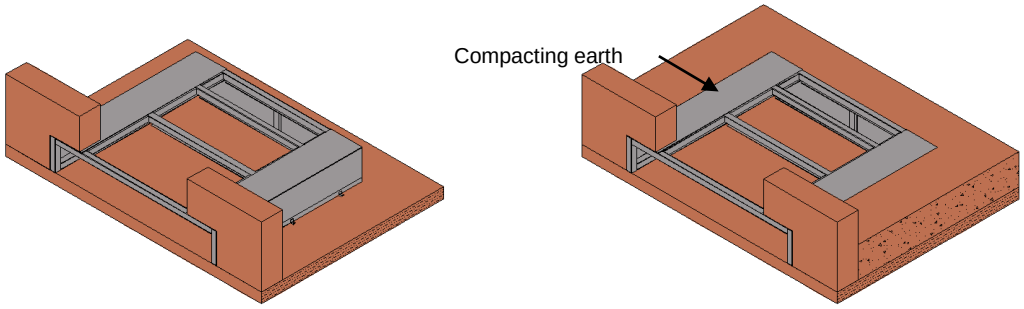
Then unwind the electrical cable and pass it through the tube that is centred at the back of the pit. Once the cable has emerged at the other end of the tube, position the leveller correctly in the pit.

05.01.01 – Installation of permanent framework with letter box and leveller WITHOUT wall.

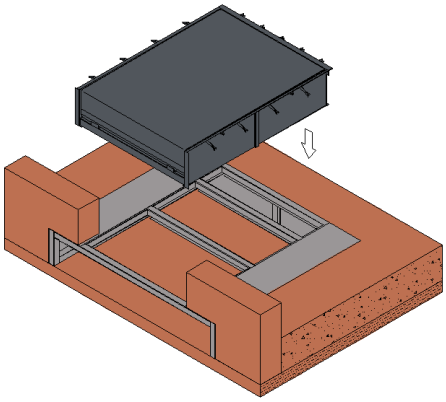
The permanent framework will be placed on the hardened concrete slab and anchored and levelled using the levelling parts supplied. Then the front wall will be built.

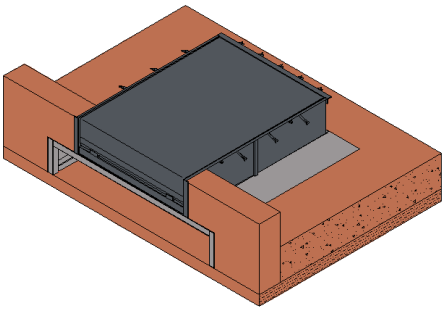


Once the permanent framework has been anchored and levelled and the front wall built, the earth will be supplied for compacting. Compacting of earth will ONLY be done up to the level of the letter box structure.

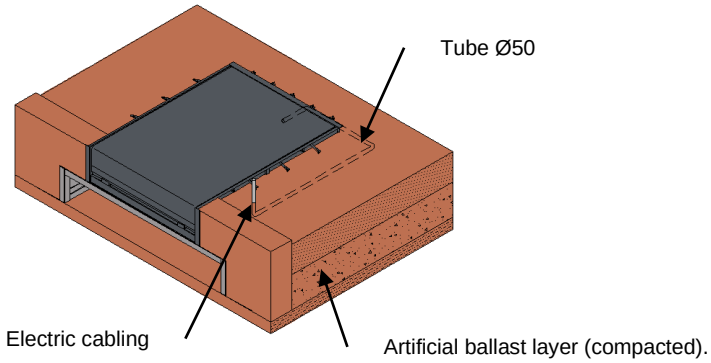


Then place the leveller on the framework, fitting it into the front wall. Once in place, it will be anchored to the permanent framework with weld spots.

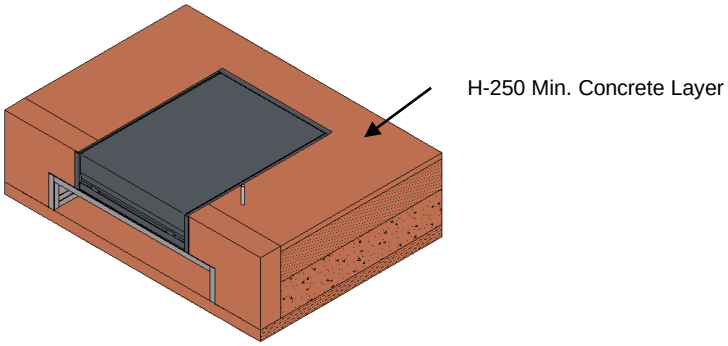




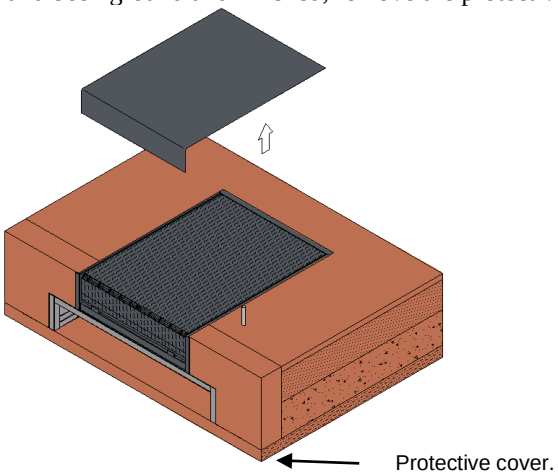
Install the Ø50 tube for the electrical ducts. Install a cable guide in the tube or pass the cables directly from the leveller through the tube.
Take the tube from the ground next to the site foreseen for the electrical panel, and finish adding and compacting the earth.



Open all the claws and weld the ends of the claws of the leveller to the framework of the building floor and add the final paving concrete.

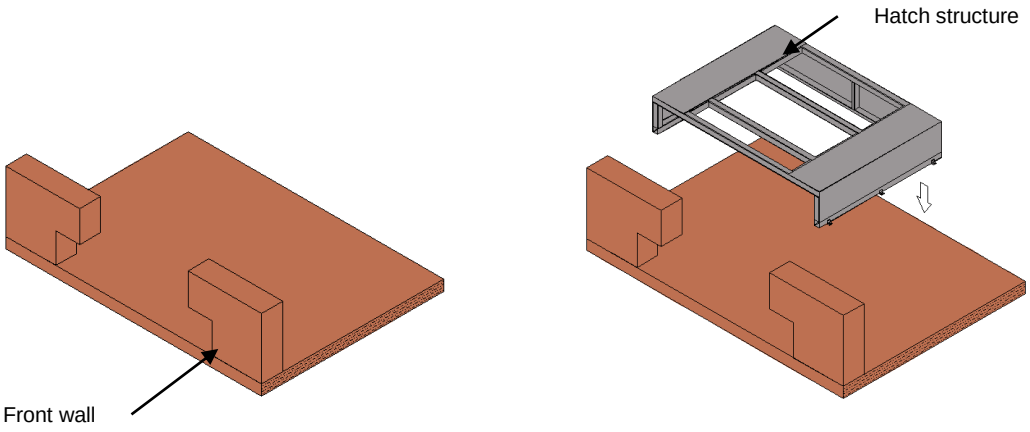


Lastly, after the paving has hardened and been ground and finished, remove the protective cover.

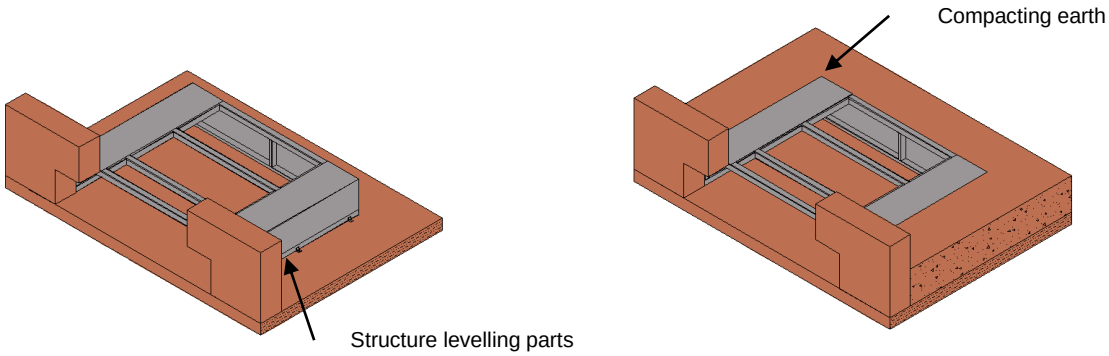


05.01.02 – Installation of permanent framework with letter box and leveller WITH previous wall.

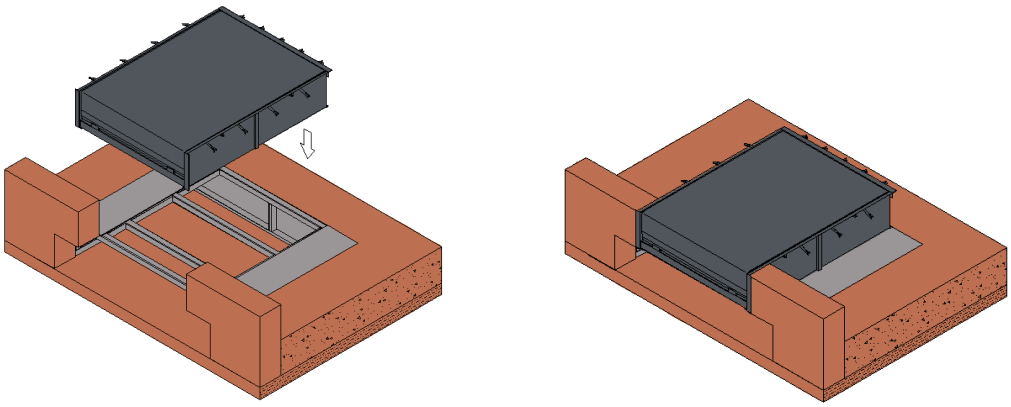
The front wall will be executed together with the base flooring, depending on the type of leveller. Then the permanent framework will be put in position, anchored and levelled using the levelling parts.



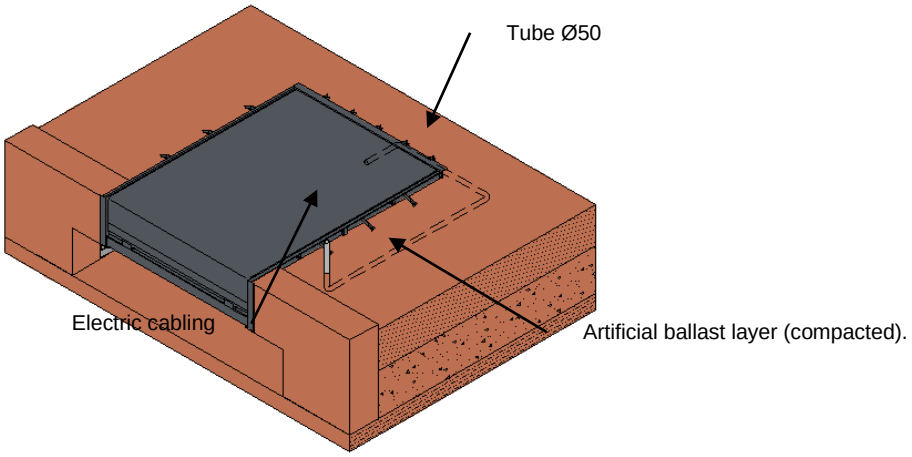
Once the permanent framework is anchored, fill with earth and compact it. Compacting of earth will ONLY be done up to the level of the letter box structure.



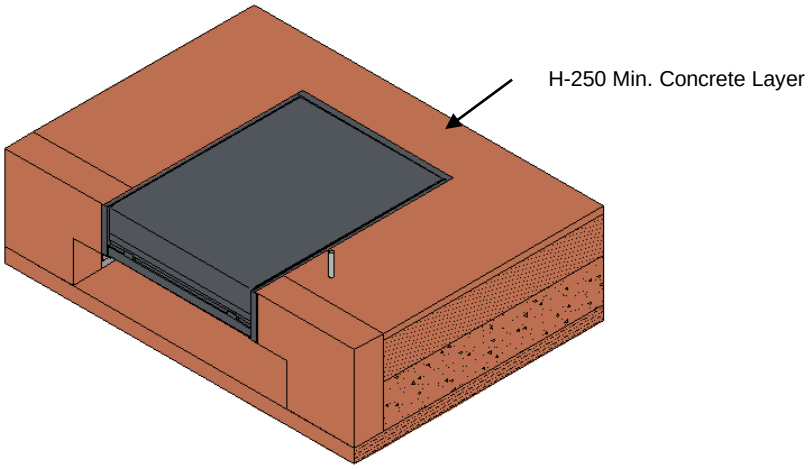
Then place the leveller on the framework, fitting it into the front wall. Once in place, it will be anchored to the permanent framework with weld spots.



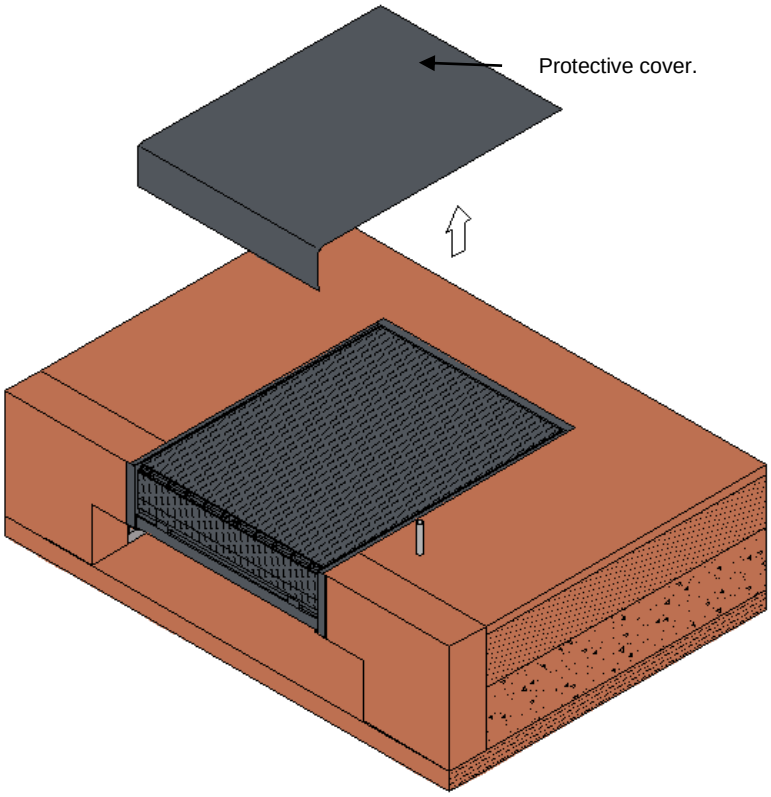
Install the Ø50 tube for the electrical ducts. Install a cable guide in the tube or pass the cables directly from the leveller through the tube.
Take the tube from the ground next to the site foreseen for the electrical panel, and finish adding and compacting the earth.



Open all the claws and weld the ends of the claws of the leveller to the framework of the building floor and add the final paving concrete.

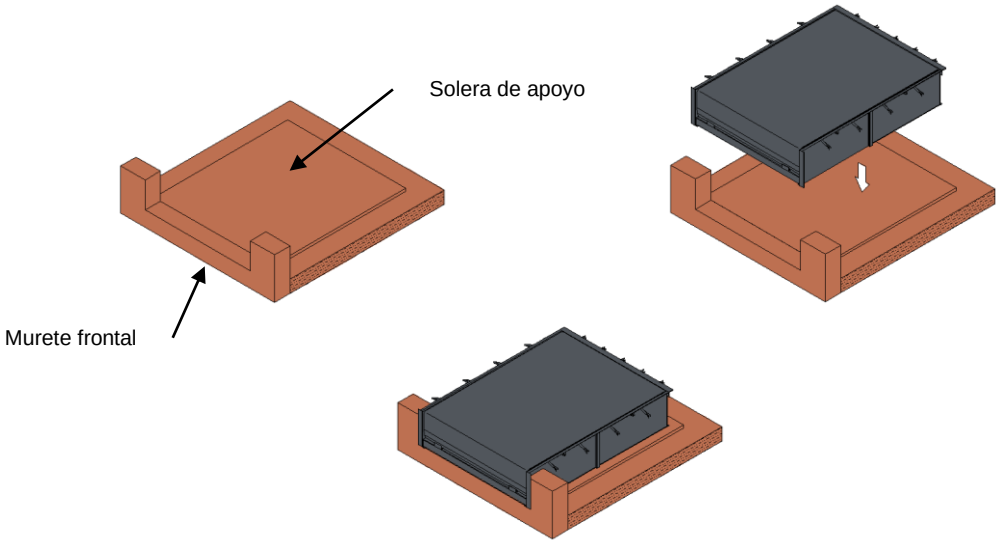


Lastly, after the paving has hardened and been ground and finished, remove the protective cover.

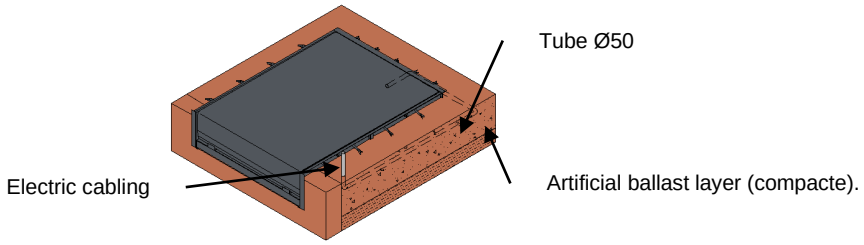


05.01.03 – Positioning of the leveller WITHOUT the permanent framework

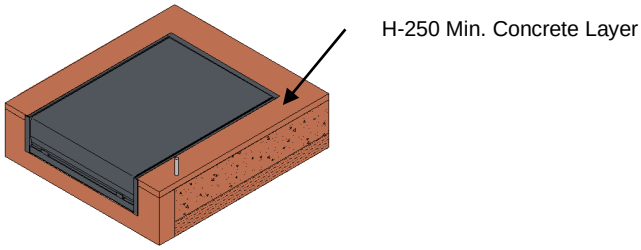
The front wall will be built as well as the supporting flooring, depending on the leveller.
The leveller will be put in position, anchored and levelled on the flooring using the levelling parts supplied.



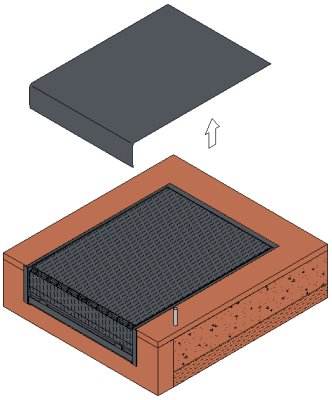
Position the Ø50 tube for the electrical ducts, passing the electric cables of the leveller through it.
Take the tube from the ground next to the site foreseen for the electrical panel, and finish adding and compacting the earth.



Open all the claws and weld the ends of the claws of the leveller to the framework of the building floor and add the final paving concrete.



Lastly, after the paving has hardened and been ground and finished, remove the protective cover.



05.02 – Installing the electrical control panel

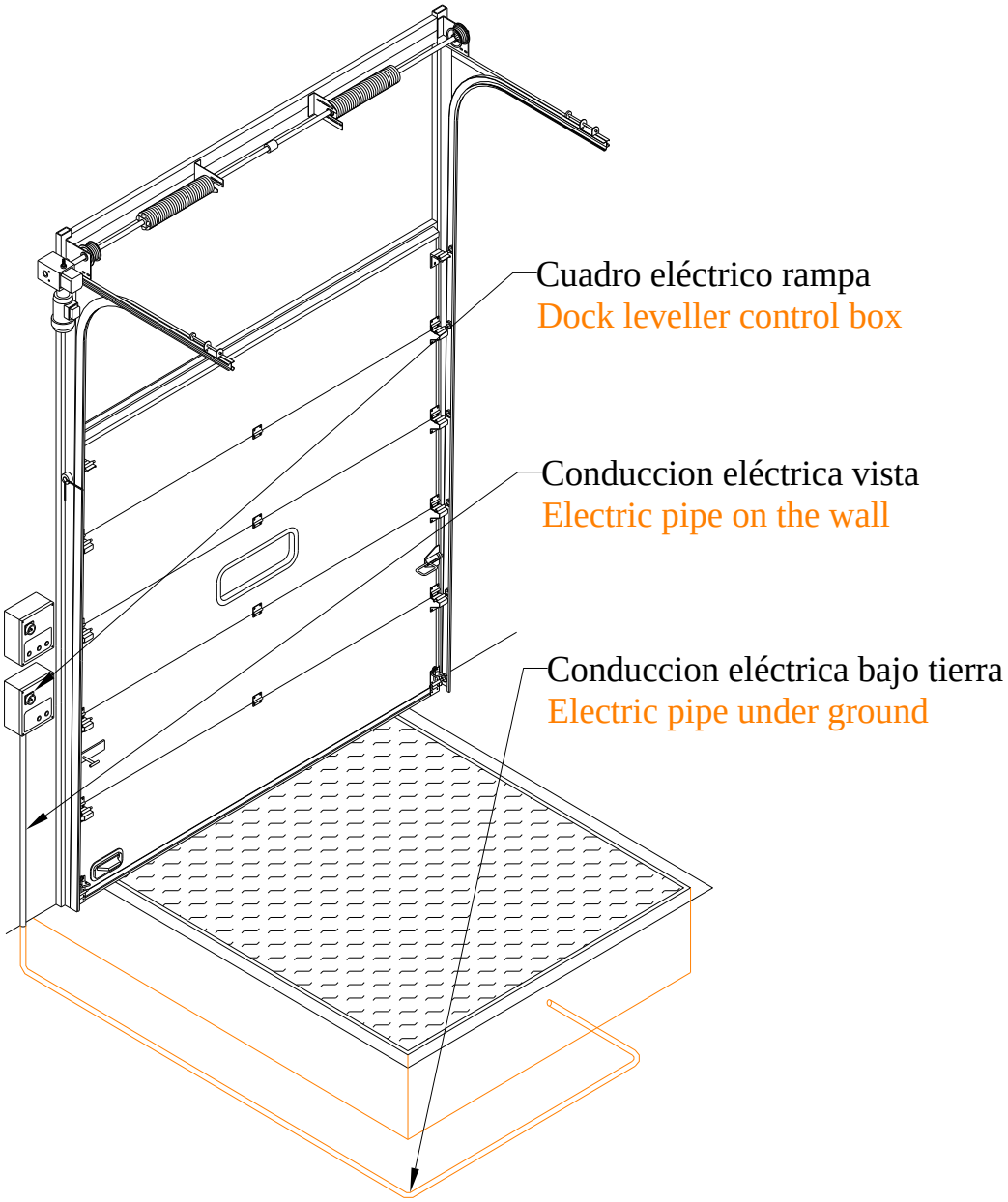
The electrical panel must be installed in the wall on the truck driver side, to allow the dock leveller operator to see and talk to the driver if necessary. (See *control panel connections, page 19)*

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 inferior structure.



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 19)*

05.03 – Completed installation

Eliminate the front flanges joining the lip to the inferior structure.

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.

05.04 – Electrical control panel connection

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

05.04.01 – Connecting the power input

Acometida eléctrica

1	2	3	4	5
Terra	R	S	T	N

Conexión motor eléctrico

6	7	8	9
Terra	U	V	W

Maniobra

10	11	12	13	14	15
EV3	EV3	EV2	EV2	EV1	EV1

16	17	18	19	20	21
24v	24v	S1	COM	S2	S3

22	23	24	25	26
S3	Stop	Stop	EV4	EV4

05.04.02 – Electro valves connection

1 Electrical connection ground
2 Power input R – 1 phase
3 Power input S – 2 phase
4 Power input T – 3 phase
5 Netural power input
6 Ground
7 U – phase 1 pump motor output
8 V – phase 2 pump motor output
9 W – phase 3 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
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.O. stop button (Connection between 23 and 24 if not used)
24 N.O. stop button (Connection between 23 and 24 if not used)
25 EV4 segmented lip 24V ac electro valve
26 EV4 segmented lip 24V ac electro valve

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

06 – Dismantling

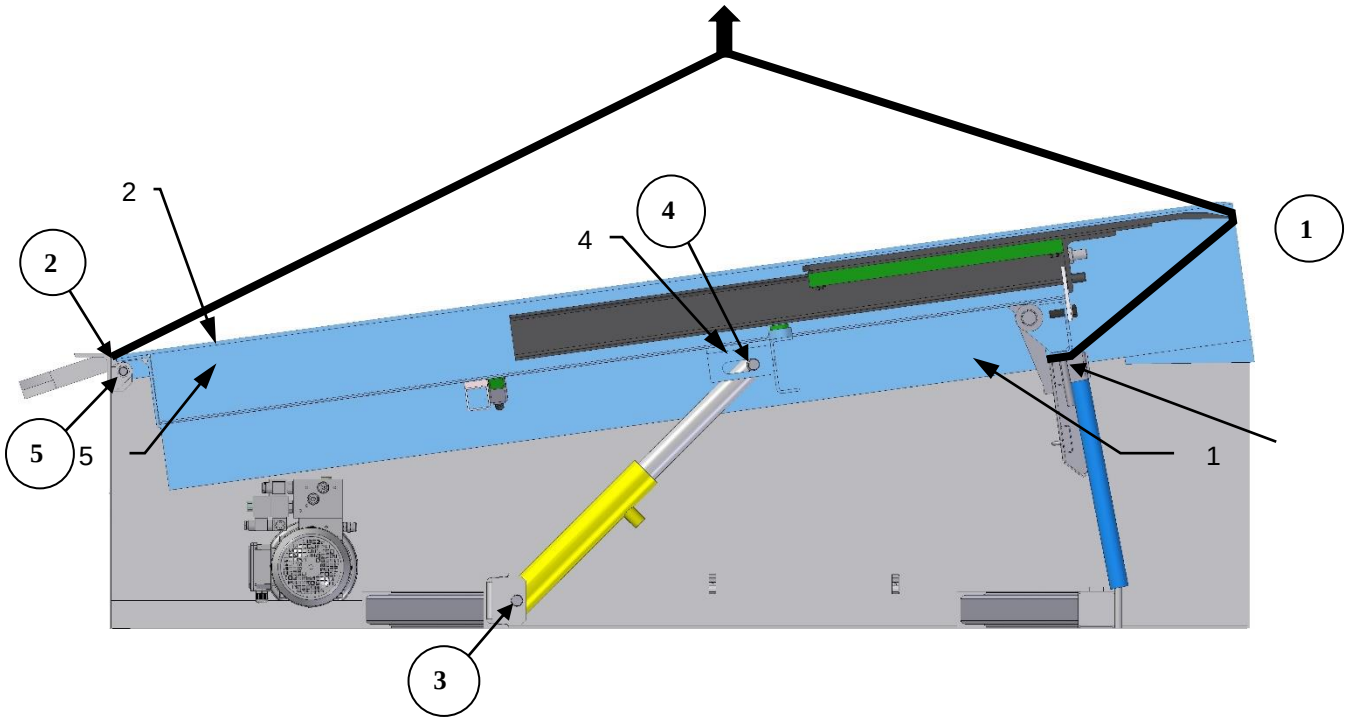
It is important to bear in mind that this type of leveller cannot be dismantled completely as the inferior structure is attached to the loading bay paving using framework.

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 to its maximum opening. Then 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 inferior structure 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** - *There must be 400v between **R** and **S*** - *There must be 400v between **R** and **T*** - *There must be 400v between **R** and **N*** • Check the voltage in the section switch terminal block - *There must be 400v between **R** and **S*** - *There must be 400v between **R** and **T*** • Check the voltage at the input of section switch **L1**, **L2** and **L3** - *There must be 400v between **L1** and **L2*** - *There must be 400v between **L1** and **L3*** • Check the voltage at the output of section switch **T1**, **T2** and **T3** - *There must be 400v between **T1** and **T2*** - *There must be 400v between **T1** and **T3*** • Check the voltage in contactor **2T1**, **4T2** and **6T3** - *There must be 400v between **2T1** and **4T2*** - *There must be 400v between **2T1** and **6T3***
The board does not light up ***Red led***	• Check that the voltage between **N** and **R** in the terminal block is 230v - *The same voltage should also be present between **N** and **2T1** of the contactor* • Fuse blown - *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)* ▪ *Replace the board* - *Fault in board or damaged tracks* ▪ *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** *There should be 400v between **R** and **S*** - *There should be 400v between **R** and **T*** • Check the voltage in the section switch terminal block - *There should be 400v between **R** and **S*** - *There should be 400v between **R** and **T*** • Check the voltage at the input of section switch **L1**, **L2** and **L3** - *There should be 400v between **L1** and **L2*** - *There should be 400v between **L1** and **L3*** • Check the voltage at the output of section switch **T1**, **T2** and **T3** - *There should be 400 v between **T1** and **T2*** - *There should be 400v between **T1** and **T3*** • Check the voltage at contactor **2T1**, **4T2** and **6T3** - *There should be 400v between **2T1** and **4T2***

	- *There should be 400v between **2T1** and **6T3*** • Check the voltage at the contactor output in **1L1**, **3L2** and **5L3.** *(activate the contactor manually or with the button)* - *There should be 400v between **1L1** and **3L2*** - *There should be 400v between **1L1** and **5L3*** • Check that the motor guard has not fused - *The black button should be pushed in and the red one out* • Check the input voltage of the motor guard **1L1, 3L2 and 5L3** *(activate the contactor manually or with the button)* - *There should be 400v between **1L1** and **3L2*** - *There should be 400v between **1L1** and **5L3*** • Check the output voltage of the motor guard **2T1, 4T2** and **6T3** *(activate the contactor manually or with the button)* - *There should be 400v between **2T1** and **4T2*** - *There should be 400v between **2T1** and **6T3*** • Check the voltage of the cables from the motor guard to the terminal block. *(activate the contactor manually or with the button)* - *There must be 400v between them* • Check the voltage in the terminal block **U**, **V** and **W** (activate the contactor manually or with the button) - *There must be 400v between **U** and **V*** - *There must be 400v between **U** and **W***
The motor guard jumps	• Motor guard amperage low. *(Check the motor characteristics plate)* - *Turn the amp adjuster in a clockwise direction to raise the amps.* • Faulty cabling - *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* - *Check that the cables are not crossed. Place the multimeter between the following cables (there must be no continuity between them):* ▪ *brown and black* ▪ *brown and grey* ▪ *black and grey* • Shunt to ground - *Place the multimeter between the following cables (there must be no continuity between them):* ▪ *ground and brown* ▪ *ground and grey* ▪ *ground and black* - *There must be no continuity between the motor housing and the motor connections **U**, **V** and **W.***
The motor DOES NOT function	• Check the output voltage **U**, **V** and **W** - *There must be 400v between **U** and **V*** - *There must be 400v between **U** and **W*** • Check the motor cables and motor connections - *There must be 400v between **U** and **V*** - *There must be 400v between **U** and **W*** • Check that the motor has not seized up - *Dismantle the fan housing and turn manually* • The contactor does not function - *Check whether there is continuity in the button* - *Check the terminal block connection (terminal **S1**) (18 and 19)* - *Check the safety connection (terminal **FC1**) (24 and 25)* - *If **no** safety element is installed there must be a bridge connection between terminal **FC1** or 24 and 25* - *If a safety device is connected check it is on **NC** (contact closed)* • Check the STOP connection in the terminal block (terminal 23-24) - *Check whether a safety device is connected in the stop terminal or check the bridge connection* • Contactor relay damaged - *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* • Contactor damaged - *Check whether voltage is present in the contactor between **A1** and **A2** m, there must be 230vwhen pressing the button.*
The motor functions but it does not ascend	• The motor is turning in reverse - *Change 2 motor phases (**U** for **V**)* • The limit valve of the power unit is not correctly adjusted - *Tighten the valve by quarter turns and check*
Lack of hydraulic oil	• Fill the hydraulic circuit • 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) - *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)* • Check the STOP safety in connection terminals 23-24 - *If **no** safety element is installed there must be a bridge connection between connection terminals 23 and 24* - *If a safety device is connected check it is on **NC** (contact closed)* • Check the output voltage of terminal **EV1** (14-15) - *There must be 24v between connection terminals 14 and 15 after pressing once (the second relay is blocked)* • Configuration of the 5 button mode micro switches - *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 - *Disconnect the cable of connection terminals **EV1** (14-15) in the electro valve and check the cable continuity* • Check the input voltage of the cowl is 24v ~ - *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* • Electro valve coil - *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.*** • Electro valve in sliding door - *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 - *If the valve is too tight turn the screw in an anti-clockwise direction (loosen)* - *If the vale is too loose, the piston safety valve could be triggered (tighten)* • Piston safety valve - *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 on the electro valve	• Check the fuse of **2A** (below the transformer) - *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)* • Check the STOP safety in connection terminals 23-24 - *If **no** safety element is installed there must be a bridge connection between connection terminals 23 and 24* - *If a safety device is connected check it is on **NC** (contact closed)* • Check the output voltage of terminal **EV2** (12-13) - *There must be 24v between terminals 12 and 13 after pressing once (the first and third relays are blocked)*
Electro valve	• Cable cut - *Disconnect the cable of terminals **EV2** (12-13) in the electro valve and check the cable continuity* • Check the input voltage of the cowl is 24v ~ - *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* • Electro valve coil - *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.*** • Electro valve in sliding door - *Check that when the electro valve cowl is taken off and replaced, the sliding door can be heard activating and deactivating* 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) - *Open the valve in quarter turns and check* • Hydraulic oil level
Piston	• Check that the piston and sleeve have no leaks and that the piston is not bent
Lip	• Lip too stiff - *Dismantle the piston and check whether the lip moves correctly or whether it*

	becomes blocked at some point along the way 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) - *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)* • Check the STOP safety in connection terminals 23-24 - *If **no** safety element is installed there must be a bridge connection between connection terminals 23 and 24* - *If a safety device is connected check it is on **NC** (contact closed)* • Check the output voltage of terminal **EV3** (10-11) - *There must be 24v between terminals 10 and 11 after pressing insert lip (the first and fourth relays are blocked)*
Electro valve	• Cable cut - *Disconnect the cable of terminals **EV3** (10-11) in the electro valve and check the cable continuity* • Check the input voltage of the cowl is 24v ~ - *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* • Electro valve coil - *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.*** • Electro valve in sliding door - *Check that when the electro valve cowl is taken off and replaced, the sliding door can be heard activating and deactivating* 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) - *Open the valve in quarter turns and check* • Hydraulic oil level
Piston	• Check that the piston and sleeve have no leaks and that the piston is not bent
Lip	• Lip too stiff - *Dismantle the piston and check whether the lip moves correctly or whether it becomes blocked at some point along the way* 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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