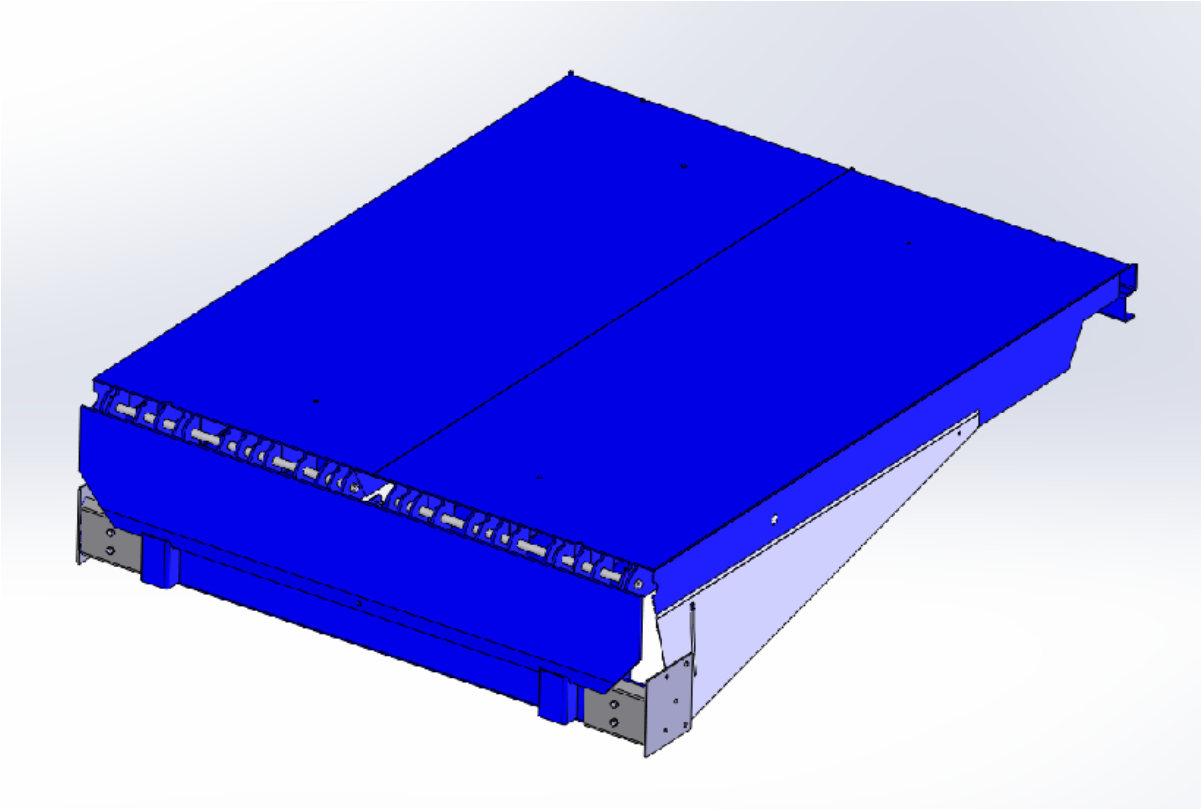
BRIDGE URH
DOCK LEVELLERS

MANUAL OF INSTRUCTIONS AND USE



Cod. 6M0000051 **June 2015**

INDEX

1. GENERAL INFORMATION

1.1. PURPOSE AND CONTENT OF THE MANUAL

This manual is a main part of the machine supply and must follow the entire sales course till the final user. In it you will find all the documents certifying that the machine complies with the law limitations and any information regarding the correct and safe use of the dock leveller. Moreover, it gives instructions to carry out a proper and rational installation, starting up, adjustment, maintenance and inspection.

! Some pictures of this manual might show some details or parts that may be different from the dock leveller's, but this doesn't change the validity of the information included.

1.2. MANUAL'S USERS

This manual is meant for:

- the staff in charge of installation (INSTALLER)
- the operator (CONDUCTOR)
- the staff in charge of maintenance (MAINTENANCE MAN)

! Conductors must not undertake any action destined to Maintenance men or qualified technicians. The building form is not responsible for damage coming from the non-observance of this prohibition.

The manual must be kept by a reliable person in charge of this purpose and in a suitable place, so that it is always available for consulting and in perfect conditions.

In case of loss or deterioration, the substitute documents must be requested directly to ARCO Industrie s.r.l. or to the retailer near the area you live by mentioning the dock leveller's registration number.

! Anyone using the dock leveller must know the manual perfectly. Making any change in the manual without previous written authorization by the building firm is strictly forbidden.

The instruction book and the declaration of conformity must always be with the machine. Three different symbols have been used in this manual to signal any possible danger to pepople or to the door or any possible remarkregarding the works in progress. Here below you'll find some a few symbols used in this manual for mandatory signs and dangers.

WARNING / GENERAL DANGER

OBLIGATION

ELECTRICAL DANGER

1.3. LIABILITY OF THE BUILDING FIRM

The instructions of this manual do not substitute the obligations and duties for the respect of the laws in force on the safety and accident-prevention standards, but instead they supplement them.
Arco Industrie s.r.l. refuses all responsibility regarding what is written in this manual in case of:

- improper installation of the dock leveller without following the procedures shown in the manual or without respecting the domestic current safety standards;
- different use of the dock leveller with respect of what is included in the manual or with no respect of the domestic current laws on safety and accident prevention;
- non-observance or wrong observance of the instructions included in this manual;
- voltage and power-supply faults in the system;
- mechanical and electrical changes or modifications of other kind that have not been authorized in writing by the building firm;
- use by unauthorized or untrained staff;
- lack of use of the personal-safety devices established by the regulations regarding any manoeuvring or maintenance servicing to be made;
- lack of use of suitable clothes during the carrying out of one's job with no dangerous obstacles or entanglement;
- use of the dock leveller before it is tested or before any recurrent control and maintenance service;
- the mass-produced dock levellers are meant to work in ordinary places, therefore it is forbidden to install them in:
  - special places
  - particularly-damp places;
  - particularly-dusty places;
  - places with a high concentration of acids or of any other agent that might corrode or damage the door parts;
  - polluting areas;
  - places with a high risk of explosion.

1.4. GUARANTEE

The guarantee on the Machine Components starts from the date shown on the corresponding delivery note and it splits as follows:
12 months on the mechanical parts;
12 months on the electrical parts, electronics and engines.
The guarantee only includes the replaced parts, and not the manpower or the transport expenses.
The guarantee does not include any damage to the machine caused by:

- transport or moving
- mistakes made by the operator
- improper use of the machine by the operator
- lack of maintenance as recommended in this manual
- breakdowns or breaks not due to the machine malfunction;
- awkward use of the machine by the operator

1.5. BUILDING FIRM'S IDENTITY

The electrohydraulic dock leveller is designed and created by:

ARCO Industrie S.r.l.

Via Valtesino Km 4,500 - 63065 Ripatransone AP - Italy –
Ph. +39-0735-907711 Fax +39-0735-907799
Fiscal number, VAT number and Register of companies no. AP 0166226 0445
R.E.A. 163494 - Company's capital Euros 750.000 i.v.
e-mail: Info@arcoindustrie.it – www.arcoindustrie.it

1.6. IDENTITY OF THE DOCK LEVELLER

Every dock leveller has an identification plate on it, like the one shown here below:

The plate is usually placed onto the front side of the dock leveller.
On it you can clearly see all data of the dock leveller, such as the building firm, model and type of dock leveller, its registration number, manufacturing year and maximum capacity.

! **Every dock leveller comes with a declaration of conformità as per the EN 13241 – 1 European standard.**

The machine is built according with the existing and applicable EU directives at the moment it is placed in the market.
As provided by the Machine directive no. 2006/42/CE, gives a self-certification in order to affix the EC marking.

! **After installation every dock leveller must have a certificate of testing.**

! **Without a written authorization by ARCO Industrie making any change that mihjt compromise the safety of the dock leveller is strictly forbidden.**

! **An improper use, tampering the safety devices, the lack of maintenance, and the unfilling of the certificate of testing and inspections or services made without following the written procedures or by unqualified staff**

immediately decline ARCO Industrie's responsibility and any form of insurance or guarantee.

2. TECHNICAL INFORMATION

2.1. DEFINITIONS FOR THE DOCK LEVELLER'S DESCRIPTION

To the aim of this manual, the following definitions are used:

Level: this component of the dock leveller is used as a transit way by people and means of transport, lip excepted (see picture).

Beams: this is a main part of the dock leveller and it is fixed at its lower side (see picture)

Lip-supporting beam: C-shaped part of the dock leveller that supports it when it is closed and in resting position.

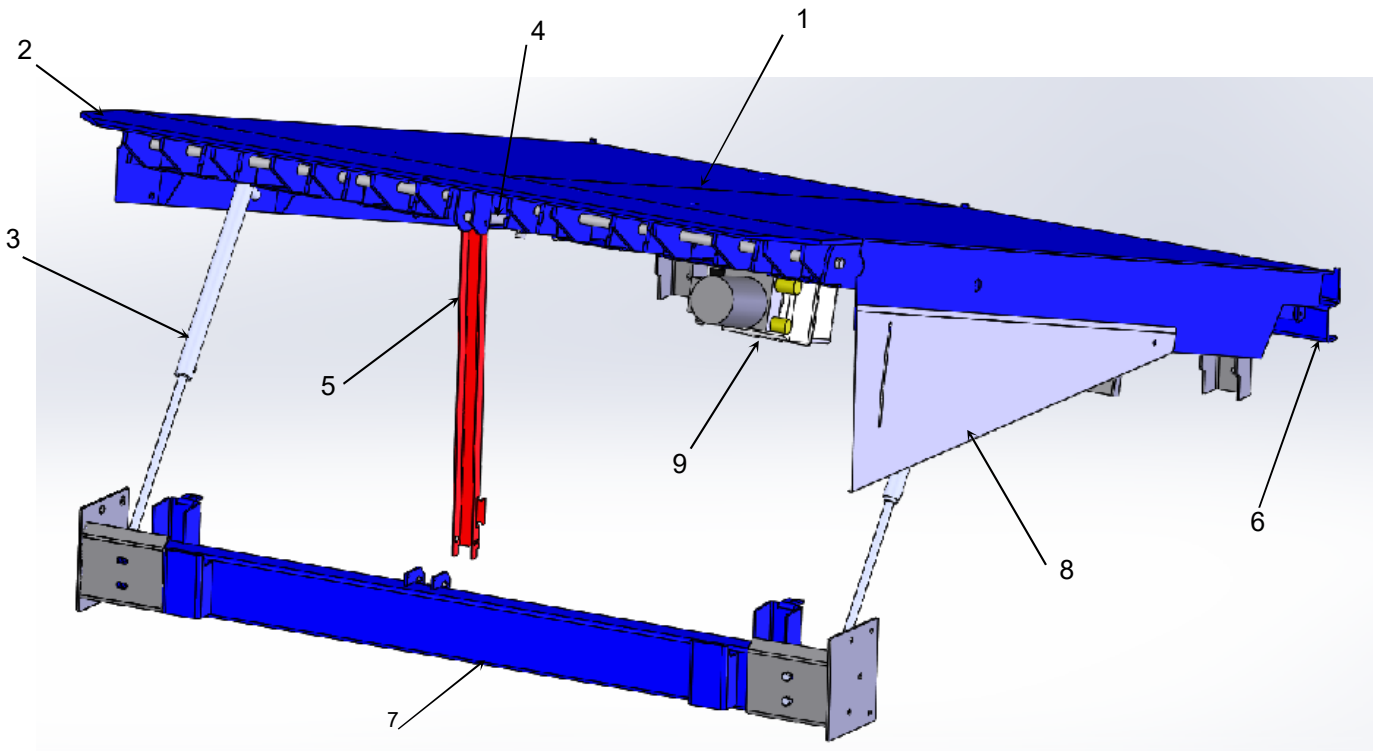
Resting position: position in which the dock leveller is placed or goes back to once the loading and unloading operations are over.

Lip: this part is hinged to the level and leans on the lane while in working position.

Flaps: they allow the reduction of the lip size. These two lateral parts move automatically through a ball device; it is possible to lower the flaps by pressing them manually.

Frame: this is the base for the ground anchorage of the dock leveller.

Prop: it is a bar for the mechanical block and it is necessary to carry out all maintenance operations safely.



Part list:
1) Platform
2) Lip
3) Lifting cylinder
4) Lip cylinder
5) Support
6) Rear beam
7) Front Beam
8) Safety panels
9) Hydraulic control unit

2.2. PURPOSE OF THE DOCK LEVELLER

The dock leveller is an appliance suitable to level the differences in height and the spaces between a similar loading point or loading areas and the surface of a vehicle; it is solely designed to allow the loading and unloading operations.

! The dock leveller is not meant to lift or lower loads or people.

! The dock leveller is not suitable for supporting loads unless it is perfectly and stably leant to the surface of the vehicle.

2.3. PRINCIPLE OF FUNCTIONING

The dock leveller works as explained here below::

- the level rises thanks to the push of the oil-prssure piston;
- once the maximum height is reached, the lip, well-fixed at the level,rotates of 90° (“it opens”);
- the level goes down by itself by leaning onto the case of the machine, so to allow the transit of the means and the loading and unloading operations.

! During these operations the dock leveller makes a sort of inclined level that rotates around the frame’s back hinges, adjusting itself to the machine height.

- Once loading and unloading are over, the level must be lifted and afterwards the lip must be closed. With this posititon of the lip and with the level completely down, the dock leveller will automatically go back to its resting position.

2.4. ENVIRONMENTAL CONDITIONS

The machine is designed to be normally installed inside an industrial lit, aired building, endowed with a stable and level floor. An outdoor installation and safe from bad weather is allowed (for instance the covering shelter).
In case of environmental conditions different from the ones written here below there must be specific agreements.

Allowed temperatures:	-10°/+40° C
Proportional dampness:	max. 80 %

LIGHTING

The lighting on work place must comply with the laws in force in the Country in which the machine has been installed, and in any case it must ensure a good visibility from every point of view (300 lx suggested), in order to avoid dangerous reflections and to allow a clear reading of the control board as well as the identifying of the emergency push button.

SOUNDS

The machine is designed and manufactured in order to reduce the level of sounds at its source.
The level of sound pressure is lower than 70 dBs (A), as registered from the position of the operator.

2.5. TECHNICAL DATA

2.5.1. LOAD TYPE

All dock levellers are designed in order to allow the transit of manual or electrical transpallets, fork-lift trucks and similar industrial trucks complying with the alle EN 1398 standards.
The wheels of the fork-lift trucks must not widen less than 150 mms.

2.5.2. LOADING CAPACITY

The maximum loading capacity clearly shown on the identification plate tells the the maximum load allowed on the dock leveller while in working position.

! The maximum capacity to be considered is with fully-loaded lifting truck
! Using overloaded lifting trucks, compared to what is shown on the plate, is strictly forbidden.

2.5.3. WORKING POSITIONS

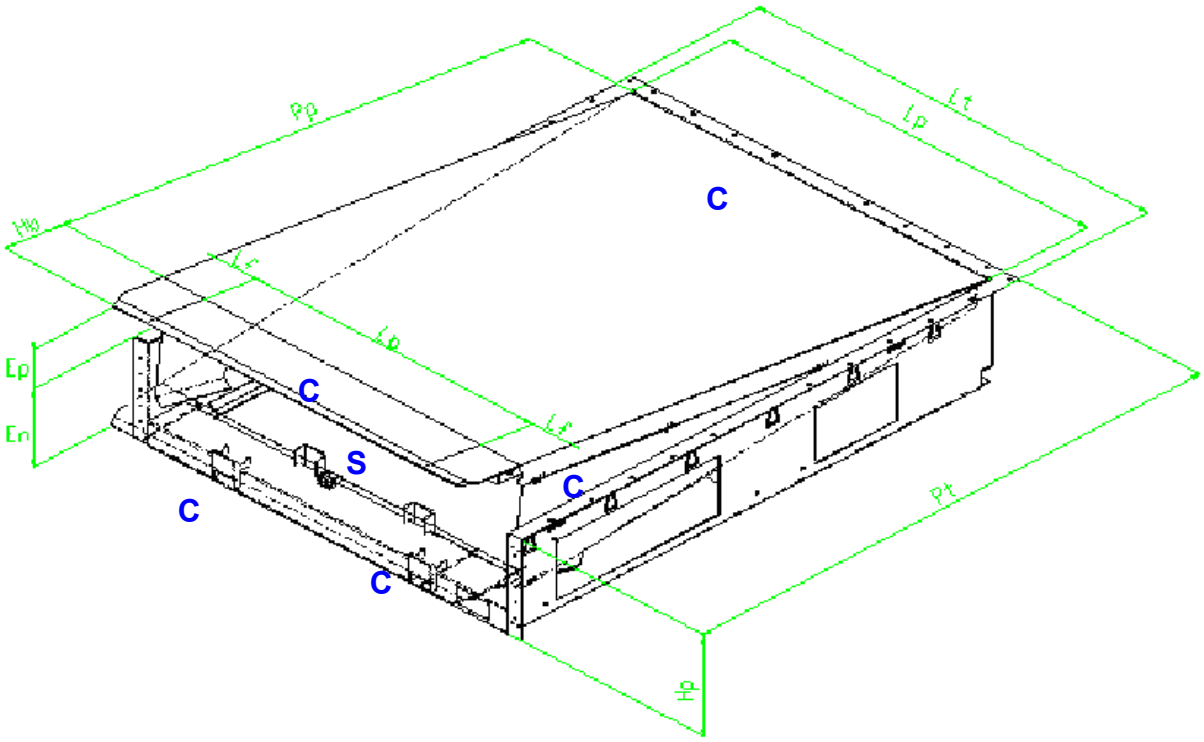
As to the current regulations, all dock levellers must be designed so that their slope while in working position is not overi ± 12.5% (about ± 7°).
For some kinds of dock levellers it is necessary to have the level incline more often than what fixed by the regulations, but this is only to favour the docking operations.

Loading and unloading must always be carried out with total respect for the rule.

For this reason, some red stripes are placeds when necessary in order to clearly show the maximum positive (or negative) working inclined position. For a maximum positive inclination, the stripes to be considered are the ones on the side protection panels, while for a maximum negative inclination the stripes to be considered are the ones shown on the frame.

! LIMIT FOR POSITIVE INCLINATION – In case the red stripes on the side panels are visible from above the floor level, using the dock leveller is strictly forbidden.
! LIMIT FOR NEGATIVE INCLINATION – In case the level is below the red stripes of the frame, using the dock leveller is strictly forbidden.

2.6. OVERALL DIMENSIONS AND WEIGHTS



2.7. STANDARD EQUIPMENT

The equipment listed here below refer to the mass-produced machines; as a consequence, any possible special supply might need different components from the ones listed.
When supplied, the machine is equipped with:

- control board;
- manual of instructions;
- rubber bumpers;
- identification plate

2.8. SAFETY DEVICES

a) A one-way blocking valve (shield valve) is placed at the bottom of the level's lifting piston, which interferes by blocking a possible accidental or uncontrolled descent (for instance.: the truck leaves before the loading or unloading is over).

! WARNING: the interference of the blocking valve with a load that is over 20 kN (2000 Kgs) may cause permanent damage at the structure.

b) In the oil-pressure circuit there is a limiting pressure valve which is adjusted in order to avoid a functioning with a pressure over 115% compared to the standard working pressure.

c) The minimum protection level of the electrical appliances against the danger of water- or foreign-bodies penetration is IP 54 as to what is established in the EN 60529 rule of 1991.
d) The control board is equipped with an emergency push-button control; in case it is set in action, the dock leveller stops immediately, no matter what position it is in.
e) Yellow and black stripes for the safety of the cross-traffic.
f) The red stripes on the side panels or on the frame show the maximum gradients allowed when the dock leveller is in working position.

! Working at greater inclined positions than what is signalled by the red stripes is strictly forbidden.

g) Two rubber bumpers in order to avoid possible damage at the dock leveller coming from a wrong manoeuvring of the vehicle.

2.9. RESIDUAL RISKS

The machine is meant and manufactured in order to remove all risks deriving from its use. During the standard use and maintenance operators are exposed to some residual risks that, for the kind of operations themselves, cannot be completely removed.

The residual risks noticed are:

- Shearing: in the areas signalled with a “C” letter (see picture at previous page).
- Entangling: while the machine is moving, it is due to inappropriate clothes and footwear
- Dragging: during the lifting/descent stages of the level and the lip’s returning/coming-out stages.
- Collisions: while the lip is closing or opening. **Never stop in the lip area while it is working.**
- Crushing: between the level and the frame in the area marked with an “S” letter.

To reduce these dangers, a “dead-man” drive was arranged to move the dock leveller; moreover, during installation it is absolutely necessary to:

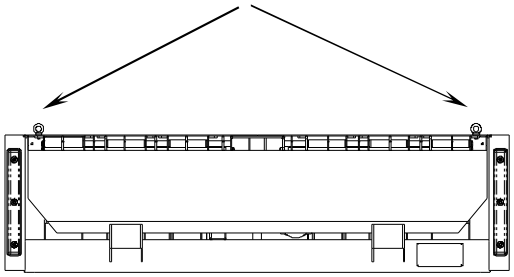
choose a favourable position of the control board so that the operator can perceive all moves of the dock levellers and the possible danger that might derive from them.

mark the “working area” of the dock leveller appropriately, which includes all areas with moving parts and nearby. Place some suitable visible signs and train your staff to not enter this area when the dock leveller is running or under maintenance.

3. INSTALLATION

3.1 TRANSPORT AND HANDLING

Transport must be carried out by qualified staff; the machine must be transported as if it were positioned for installation and so to avoid any damage to the components. The dock leveller is endowed with a lip which is placed in some special supports, and such position must be kept during all moving operations. For moving and lifting there are four holes on the frame that allow to insert some suitable hookings for the lifting through some cables or chains..



! ! Using any hooking point or sling different from the ones shown is strictly forbidden.
! Forking the dock leveler directly with a forklift is not allowed.
! It is very important to verify that the forklift, the crane, the bridge crane and any other means used for the lifting have a capacity that suits the weight and the dimensions of the dock leveler. These data can be checked on the delivery papers.
! Make sure the lip is well inserted and tight into its special front supports while the dock leveler is moved.

During delivery it is important to make sure the goods have not been damaged during transportation: in case of any damage present a written letter to the forwarding agent and a copy to ARCO Industrie, by writing clearly all data shown on the product identification plate.

! All damage caused during transportation and handling are not under guarantee. The repairing or replacing of any damaged part is on the customer's.

3.2 STOCCAGGIO

Se dopo la consegna non si procede all'immediata installazione, le rampe possono essere immagazzinate. L'ambiente in cui dovrà essere stoccata la rampa deve:

- horizontal and flat floor

- the place must be closed (protected from bad weather and dampness)
- place without danger of flooding
- place with no dust, acids or corrosive substances
- temperature between -10°C and +40°C

! **The dock levellers can also be put one onto the other, for a maximum of 3 dock levellers.**

! **When you store the dock levellers and put them one onto the other, remember to lay a shield to protect the paint between them.**

! **In case of long-lasting storage, all unpainted parts must be greased and protected.**

3.3 TIGHTENING TORQUES FOR SCREWS

For the tightening torques, see the table at the end of the manual

3.4 MASONRY PREPARATION

To install the dock leveler a pit must be built with the characteristics and dimensions specified in the data tables. It is necessary to insert on one of the two side walls a pipe to be used for the power supply cable. The pipe exit point from the floor must coincide with the area in which will then be installed the control panel.

! Always place the control panel so that the operator always has a perfect view of the dock leveler movements.

! It is strictly forbidden to place the control panel next to or near any combustible material; ensure that the area is sufficiently unobstructed around and above the control panel for a distance greater than or equal 1 meter in all directions

3.5 LAYING OF THE PIT

! Before laying the dock leveler on the pit, make sure its dimensions match with the ones shown in the drawings and that they are compatible with the dock leveler dimensions.

Dock leveler with subframe

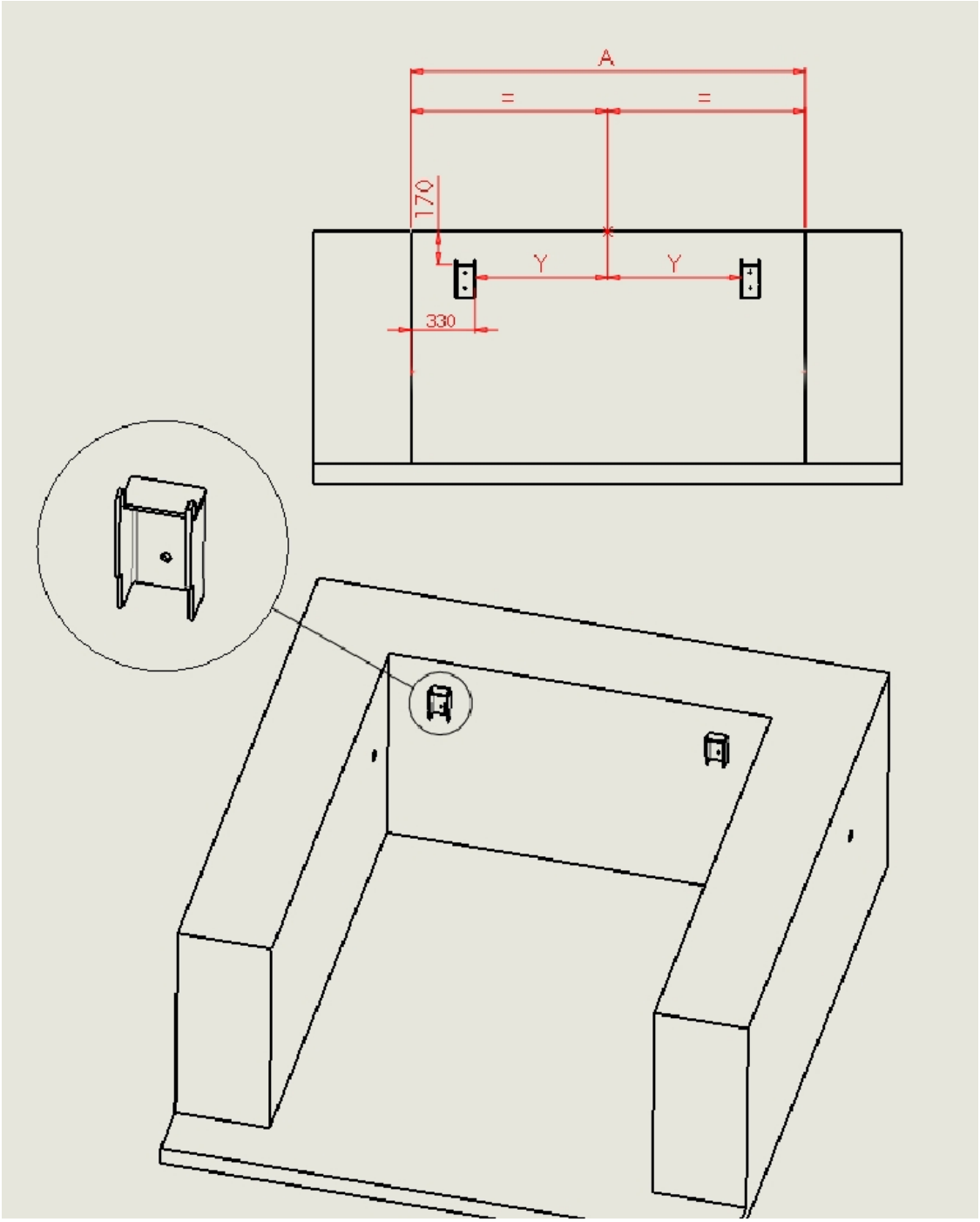
The pit for this dock leveler type must be framed with an angular subframe (min. 80x80x6) to guarantee an adequate support.

Before inserting the dock leveler inside the pit, fix with anchor bolts (n. 4 anchor bolts 12x80) the two rear feet as shown in the following figures.

Check carefully their position, level and perpendicularity with the pit plane.

Then position the front feet (next figure), also in this case check carefully their position and level. Fix the front feet using anchor bolts with flared head.

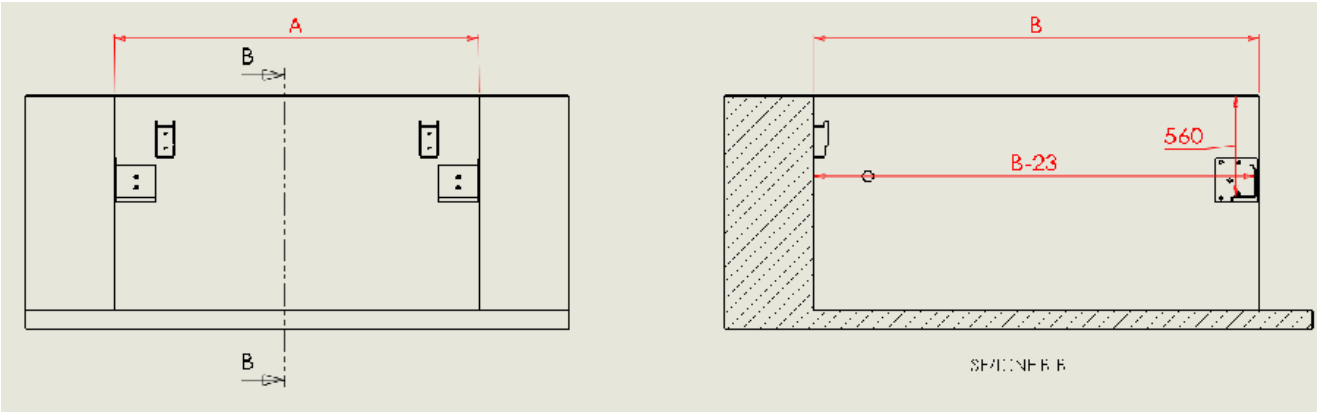
Lower the dock leveler placing the front and rear beams on their respective feet. Check and adjust the dock leveler level using the adjusting screw in the back and shims in the front.

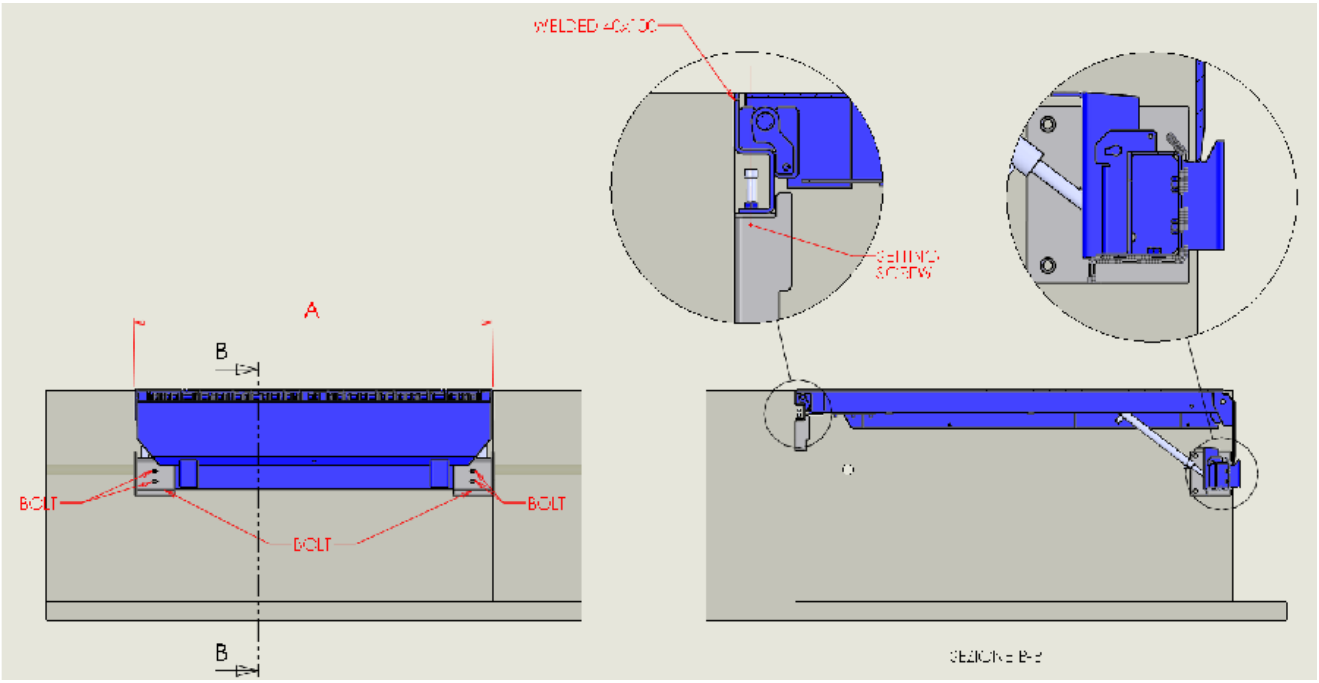


	Dock Leveller (Length xWidth)								
	22x30	**22x25**	**22x20**	**20x30**	**20x25**	**20x20**	**17x30**	**17x25**	**17x20**
A	*2230*	*2230*	*2230*	*2030*	*2030*	*2030*	*1780*	*1780*	*1780*
B	*2980*	*2480*	*1980*	*2980*	*2480*	*1980*	*2980*	*2480*	*1980*
Y	*785*	*785*	*785*	*685*	*685*	*685*	*560*	*560*	*560*

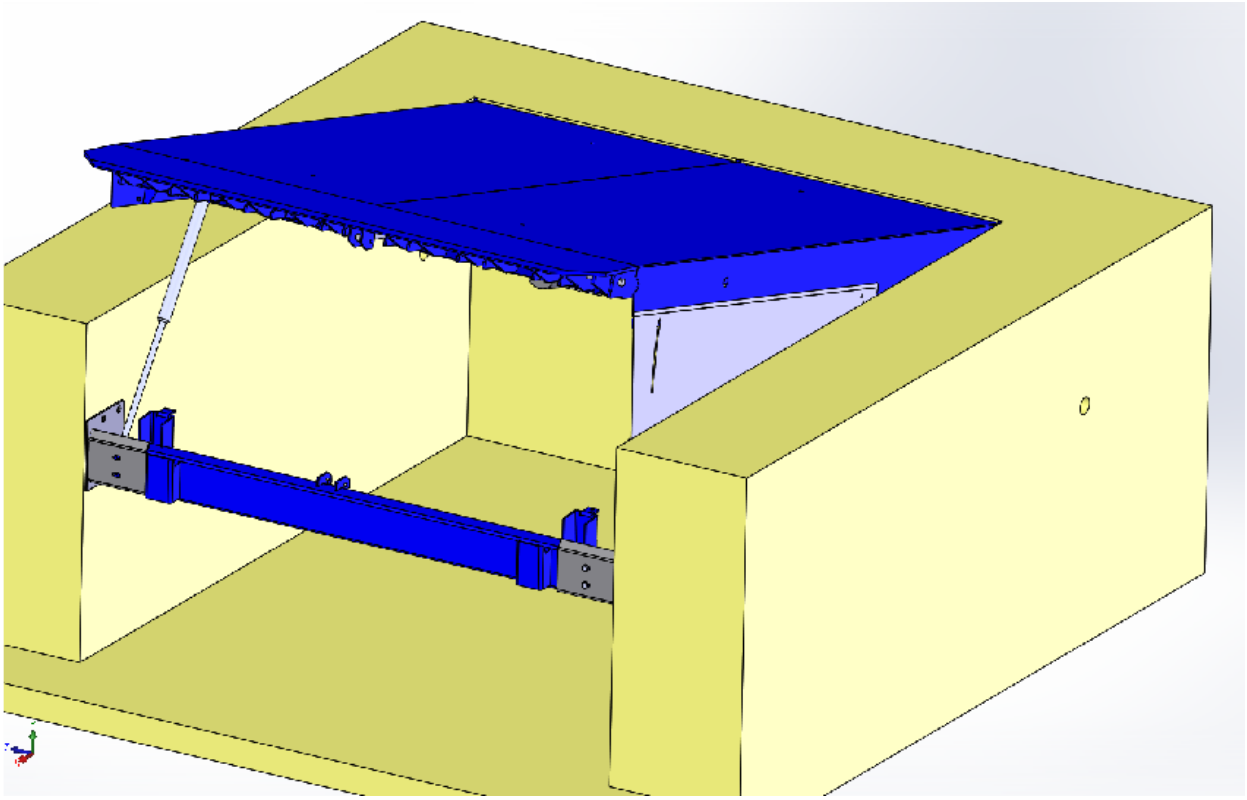
Fix the platform rear to the subframe with adequate welding for a good stability. We suggest to weld the dock leveler directly to the angular subframe with sections of welding of 40 mm every 100mm.
Before welding remove the paint on the sections to be welded and after welding check for any defect. Fix the front part to the feet with nr. 8 bolts 12x30 and grower washers. Lift and fix the platform insert the side safety sheets (bend must be on the inside), screws and bushings are already fixed on the dock leveler.

Afterwards insert the electrical cables in the passage pipe. Normally cables are already connected to the hydraulic control and must be connected only to the main panel.





*) BOLT with hexagon M12x30, washer and spring washer.



3.6 ELECTRICAL CONNECTION

Fix the electrical panel in the spot you have chosen and start the connection. The console must be fixed with 4 screw anchors to the wall over the exit of the pipes on the floor.

! Make sure voltage and frequency are ok.

! Always place the push-button controls so that the operator has a perfect view of the movements of the dock leveller and of the load.

! Cut the electrical line close to the machine by using wires that suit the machine power.

! The power supply and the installation of this equipment must be carried out solely by quailified installers and in total respect of Law 186/86, Law 46/90, the Directives CEE B.T and EMC, the CEI and CEI EN standards, of Decrees 547/55, 626/94 and 96, and the current Laws and rules.

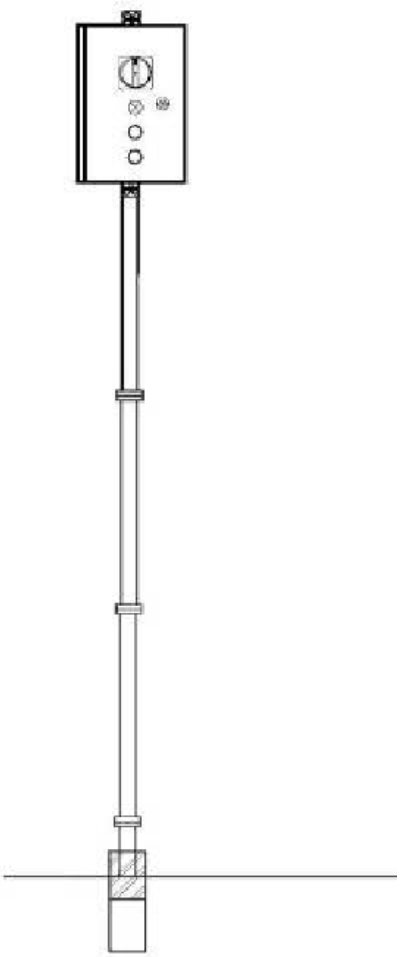
Put the feeding cable of the network into the special spot on the control board(see pictures here below) and connect the three cables of the three-phase current to the special screw clamps.
Connect the wire to the suitable clamp.

! !Check the three poles of the three-phase current are properly connected: to do it, it is enough to supply the dock leveller with power

and to check the right rotation direction of the engine. In case you don't succeed, invert two phase wires in the terminal board.

! Feeding the equipment while the panels are open is strictly forbidden.

! Feeding the equipment without having controlled they have a magnetic, thermic and differential protection and without having checked the proper functioning of the protection wire is strictly forbidden.



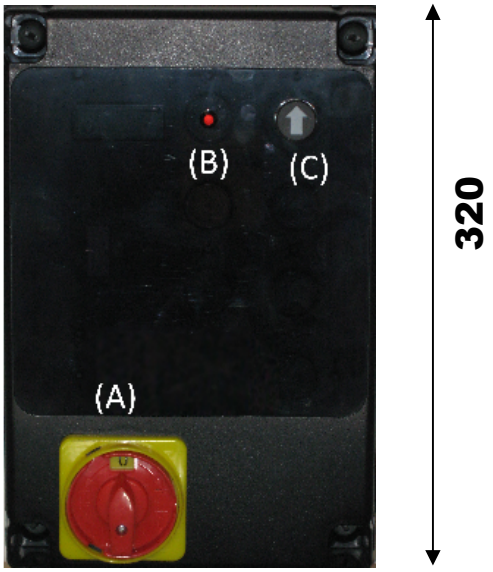
3.6.1 FEATURES OF THE CONTROL BOARD

- Dimensions H ≅ 250 B ≅ 200 P ≅ 220;
- Max. installed power: 0,75 kW
- Protection level of the control board IP54;
- Suitable equipment only for the functioning:
  - Ordinary/standard place (CEI 64-8 4° ed)
  - Average temperature ≤ 30° C
  - Max. temperature ≤ 35° C
  - Related dampness not over 50% with a temperature of ≤ 30° C
  - Polluting level: 1

3.6.2 USER'S AND INSTALLER'S LIABILITY

- The minimum features to follow (type and section) for the feeding cables are completely on the installer's or planner's, as well as the control and the calculation; however, they have to follow a proper coordination as to the current rules and laws with your automatic switch which is placedat the bottom of our equipment, with the kind of laying and with the cable itself.
- The protection devices against overvoltage, the lack-of-phase control and minimum-voltage control are completely at the customer's charge and must be installed at the bottom of our equipment.
- Ensure total protection against indirect connections with the automatic block of the circuit that feeds this equipment.
- Thermic and magnetic adjustment of your limiting switch placed at the bottom of your connection line.
- It must also ensure a suitable and differential protection that ha sto be immune to external troubles and indifferent to harmonics while staring up the engines.

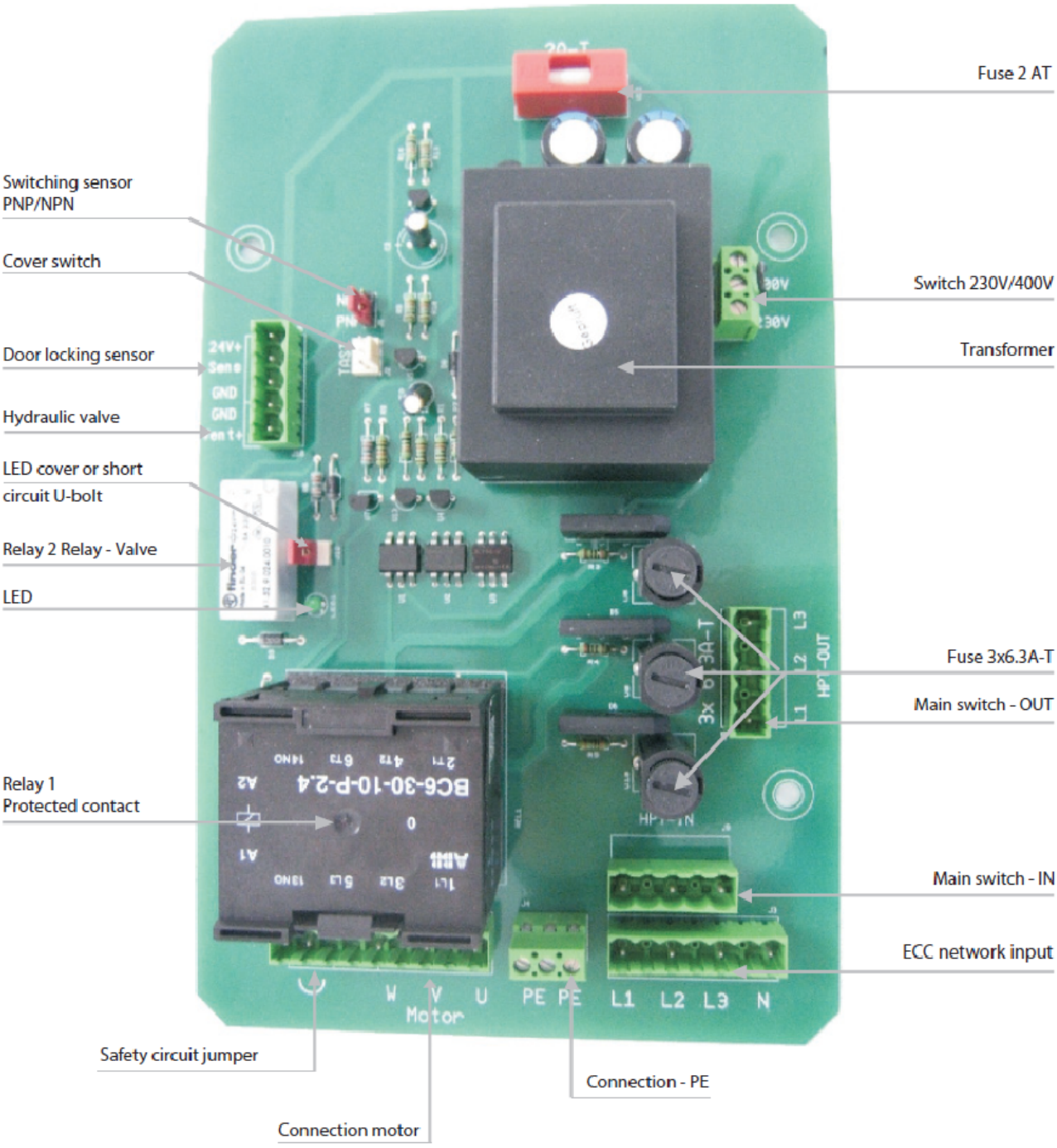
! **<u>WARNING</u>: the above specifications and regulations are totally on the customer's before the starting up, as per the Laws and rules in force.**



Key:

(A) THREE-PHASE MAIN SWITCH
(B) WARNING LIGHT
(C) DOCK LEVELLER UP BUTTON

! **WARNING: it is absolutely forbidden to transit on the dock leveller when the warning light is off.**



Connection:
Three-phase power supply: connect to terminal “ECC network input”
Hydraulic motor wiring: connect to terminal “Connection motor”
Hydraulic valve wiring: connect to terminal “Hydraulic valve” (valv + GND)

If not necessary short-circuit the "door locking sensor" (24V + sens) terminal.

3.6.3 CONTROL BOARD

- Power: 0,75 kW
- Nominal voltage: 230 – 400 V, 50 Hz
- Absorption: 230 V – 3,1 A; 400V – 1,8 A
- Turns: 2740 min.
- Cos φ = 0,84

Pump:

- With gears and fixed capacity

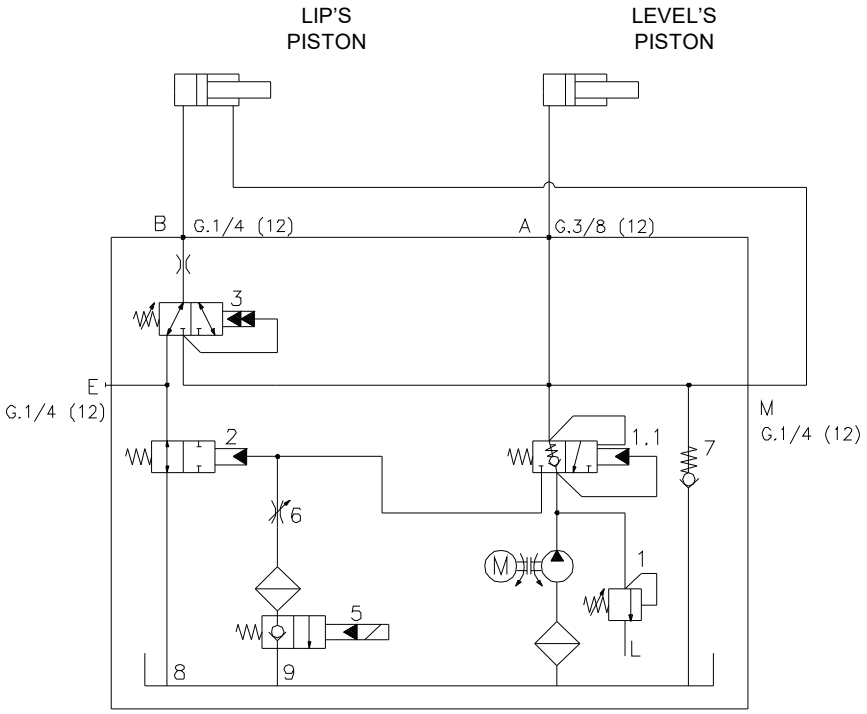
! **If the pump works without intaking oil, it will break irreparably .**

! **Reversing the rotation direction of the pump is not allowed, not even for a short time.**

Oil:

- Shell TELLUS OIL T 15

! **<u>WARNING</u>: Do not throw the used oil into any drainage, drift or water flow. Gather it and give it to the Syndicate for Used Oils (Decree 691/82).**



Control board's scheme

4. INSPECTIONS AND TESTINGS

4.1. INSPECTIONS

- Through a careful visual testing make sure the main structures of the dock leveller don't have any deformation, damage or dent that may interfere with the good functioning of the dock leveller.
- Check that the dock leveller's maintenance prop is perfectly integral with it and that it threads in its position properly.
- Make sure there are yellow/black stripes and red stripes on the sides of the level and on the lateral panels of the frame; also make sure they are not worn out and still well clear.
- The cylinders must not have any sign of collision, non devono presentare tracce di urti, scratch, rust or foreign body that may interfere with the good functioning of the dock leveller.
- The flexible tubes must not have any too-tight curve, flattening or abrasion.
- Make sure the electric wires are not disconnected, cut off or worn out.
- Make sure that bolts, nuts, connections and flexible parts are not loosened up and that there isn't any hydraulic leakage in the pipes or in the cylinder.

4.2. TESTINGS AFTER INSTALLATION

The test of the installed dock leveller is on the user's and must be done by following the steps here below:

a) Check that the control board is properly connected to the electricel system.
b) Supply the dock leveller with power and get it have a working/opening and leaning cycle on a truck, and going up by placing it back to its resting position. While the dock leveller is going down make sure it gets blocked when the emergency stop-button is set in action. Unblock the stop-button, reset the dock leveller and make sure it finishes the working cycle.
c) Get the dock leveller have some working cycles and make sure it makes them properly, especially the opening and the closing cycles; moreover, check that the li pleans exactely inside the support while resting.
d) Set the dock leveller in action and put it in its working position, then place a weight corresponding to 10% of the nominal load in the middle of the level. Take away the leaning point off the li by checking that the dock leveller immediately blocks thanks to the "shield" valve.

The testing must be done by qualified staff (preferably the same staff in charge of the installation), that must ensures to be working by following the safety standards in force in the Country of installation.
If this is not the case, turn to ARCO Industrie.

! **Before starting the test, make sure in the working area of the dock leveller there aren't any unauthorized people.**

5. OPERATIONAL INSTRUCTIONS

5.1. STARTING-UP CHECKS

- **Every time you start working make sure the dock leveller's safety devices work efficiently.**
- **Make sure the truck is positioned exactely in fron of the dock leveller.**
- **IN CASE THE TRUCK IS PLACED DIAGONALLY AT THE DOCK LEVELLER'S SIDE, USING THE DOCK LEVELLER IS STRICTLY FORBIDDEN.**
- **Make sure there is voltage**
- **Make sure that in the working area of the dock leveller there aren't any unauthorized people.**
- **Make sure on the dock leveller there isn't any foreign body or any dirt that may cause interfere with the movements of the level or li pwith two flaps (if there are).**

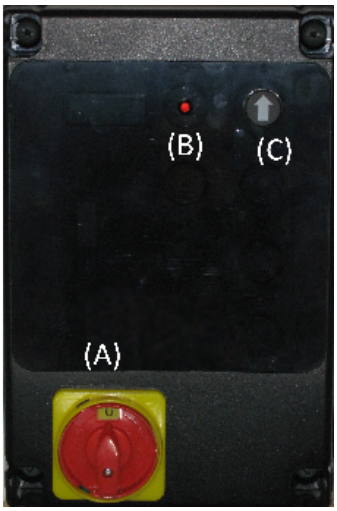
5.2. DESCRIPTION OF THE DRIVES

The control board is made up of a disconnecting switch that is the main switch and also works as emergency stop-button. The bright light shows that the solenoid for the taxiing is stirred up. The going-up push-button allows the dock leveller to go up and the lip to open. Once you release the push-button (with the bright light on), the dock leveller goes down.

(A) THREE-PHASE MAIN SWITCH

(B) WARNING LIGHT

(C) Going-up push-button



! WARNING: transit on the dock leveller when the light is off is strictly forbidden.

! WARNING: in case of switch disconnect, it is necessary to move it to the OFF position and then turn it into the ON position in order to re-engage it.

5.3. ALLOWED USE

5.3.1. FUNCTIONING OF THE DOCK LEVELLER

All dock levellers are used in order to connect the dock to the truck's level, so that the lifting trucks can get on it properly. The right procedure for the good functioning of the dock leveller is the following:

1) Make sure the dock leveller is in its resting position, the level placed horizontally and the li pplaced vertically and well at its supports.

! **Before doing anything make sure the dock leveller has not been damaged (all weldings must be complete and the parts must not be strained), there isn't any obstructing object near the rear hinges and the telescopic parts so to allow their proper movement. Moreover, ther mustn't be any load on the level of the dock leveller.**

2) Open the sectional door

3) Place the vehicle properly with the door previously opened.

! **Take special care to the truck so that it draws back perpendicularly to the dock level so to get a uniform distance between the truck's back side and the dock level.**

! **<u>WARNING</u>: check that there isn't anybody at the back of the truck when it is drawing back towards the dock.**

4) Make sure the driver has put on the hand brake, then get him give you the keys of the truck.

! **The keys will be given back to him only when loading is finished and when the dockleveller is in its resting postition.**

5) Bring the main switch (A) into position 1, press the push-button for the "going-up" and then bring the lip in a proper position by using the "forward and "backward" push-buttons. Realease the push-buttons and wait until the level comes down and li leans tightly on the truck's level.

! **Make sure the set in motion of the dock leveller doesn't cause any danger for people or things.**

6) In this position the loading and unloading of the vehicle is allowed.

! **<u>WARNING</u>: during loading and unloading make sure the bright light of the control board is always on: in case it is not, stop loading immediately and check the unsuccessful functioning.**

7) Once loading and unloading are over, press tha "going-up" push-button again and close the lip completely.

! **WARNING: never bring the level into its maximum inclination during this phase in order to avoid lip-waving; in case it happens, you must have the lip come out completely and lean it to the level of the truck again, than repeat the former operation.**

8) Release the “going-up” button and have the level come down.

! **While the lip goes down, check that it goes back into its special supports properly.**

9) Bring the main switch (A) into OFF position: the light (B) will turn off.

10) At this stage the keys can be given back to the truck driver.

! **<u>WARNING:</u> to set the stop button in action you have to turn the main switch anticlockwise (A) and bring it into position 0, the light (B) will turn off and the dock leveller stops and remains like that no matter which position it is in. To reset the push-button control turn the switch clockwise and bring it into position 1, then set the going-up button in action.**

! **Supplying the equipment with power while the doors are open is strictly forbidden.**

! **Supplying the equipment with power without checking that they have a differential magnetic and thermic shield at their botton and that the protecting conductive cable properly works is strictly forbidden.**

! **<u>WARNING</u>: transit on the dock leveller when the light is off is strictly forbidden. To bring i tinto use again, consult the table of breakdowns.**

5.3.2. STOP

The dock leveller can stop in dfferent ways:
a)Stop with interblock of the leveller: (upon request only) with this tool it is possible to prevent the dock leveller drive before the opening of the sectional door. The interblock takes away the power supplì both off the engine and off the coil; to reset the operation you have to lift the door (so that the interblock system closes the contacts) and set the going-up button in action in order to stimulate the electric valve and the engine of the control board.
b)Emergency stop: in case of danger set the main switch (A) in action and the dock leveller will stop immediately. To unblock and the reset the operation it is enough to turn the switch clockwise. Set the going-up button in action in order to stimulate the solenoid and have the dock leveller move.
c)Stop due to lack of voltage (uncontrolled stop): if there is no power the dock leveller stops, no matter what position it is in. When voltage is back again it is enough to set the going-up button in action in order to reset the warning light signalling and have the dock leveller move.

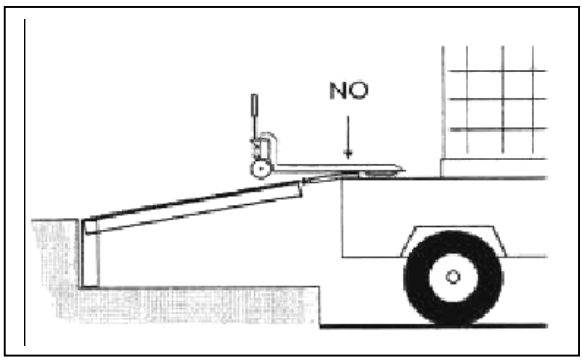
5.5. FORBIDDEN USE

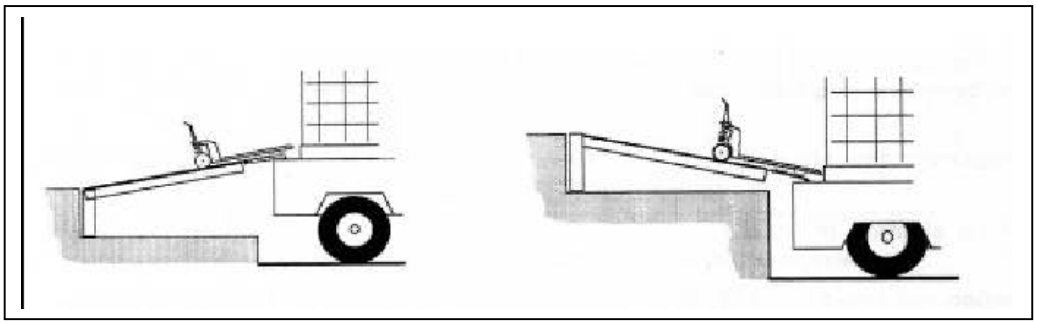
- Touching the moving parts or leaning onto them during the dock leveller’s going-up/down is strictly forbidden..
- Using the dock leveller in a working position that is more inclined than what established by the standards is strictly forbidden.The maximum gradient levels allowed are marked by the red stripes on the side panels and on the frame for the dock levellers measuring 2000 mms.

- Transit on the dock leveller of loads heavier than what allowed is strictly forbidden.
- Tampering with the structural, oil-pressure and electrical part of the dock is strictly forbidden to everybody.
- Using the dock leveller before making the necessary checks, tests and maintenance services established in this manual is strictly forbidden.
- The use of the dock leveller by unqualified staff is strictly forbidden.
- Do not use the dock leveller in case its frame has any strain or it has a trouble of any kind.
- You must always check that the level doesn't bump into people or things or doesn't cause any damage of any kind.
- Transit on the dock leveller when the warning light is off is strictly forbidden.
- When the dock leveller is in its resting position, transit on it if the lip is not well leant on the supports is strictly forbidden.
- The mass-produced dock levellers are manufactured to operate in standard places, therefore it is forbidden to install it:
  - in special places
  - in particularly-humid places
  - in places with a temperature over 35° C or over –10° C.
  - in particularly-dusty places
  - in places with a high concentration of acids or agents of any kind that might corrode or damage the dock leveller's components
  - in polluting places
  - in places with a high risk of explosion
- Using the dock leveller differently from what established in this manual is strictly forbidden.

5.5. TRANSPALLET LIMITS OF USE

When a transpallet is used, it is absolutely necessary that you reduce the grading to 4-5 %. In case you don't, you might face the following troubles:





6. MAINTENANCE

6.1. SAFETY STANDARDS

Any kind of maintenance or cleaning process must be carried out by qualified and authorized staff that have read and understood all safety standards established by the current Lawdi and all necessary precautions and safety maintenance operations shown in this manual.
All maintenance and cleaning operations must always be done when the dock leveller is off and not supplied with power: to do this, it is enough to disconnect the control board's disconnecting switch.

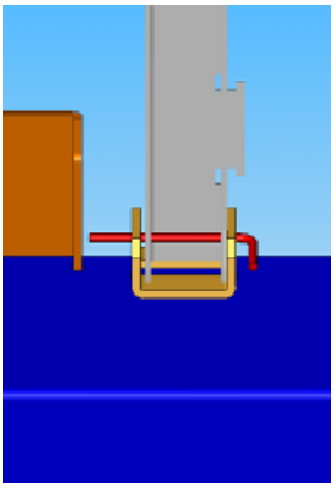
- **Any maintenance service or repairing while the dock leveller is moving is strictly forbidden; all maintenance servicings and cleanings must be done when the dock is not moving.**
- **All maintenance servicing to be done below the dock leveller must be done without load on the the dock and with the prop properly inserted.**
- **During the maintenance of mechanical and electrical part sit is necessary to disconnect the general switch.**
- **Before making any kind of work or operation place some visible signs, like the one shown here below:**

- **Don't use any solvent or inflammable.**
- **The maintenance of the dock leveller must be done solely by qualified staff, by following the instructions shown in this manual and taking all the necessary precautions so to not compromise the safety of people.**

6.2. MAINTENANCE PROCEDURE

To make a proper maintenance you need to:

- turn voltage off by disconnecting the general switch;
- lift the level through the special eyebolts;
- clasp both props to support the level;



- check all points shown in the following table and respect its continuity;
- the person in charge of maintenance will have to fill in a table similar to the one shown here below and keep it;
- when maintenance is over, get the dock leveller have a complete working cycle, by making sure the dock leveller doesn't vibrate too much or doesn't utter an irregular noise or any other "strange" and unusual noise;
- if this last control results to be positive, you can use the dock leveller again.

6.3. TABLE: MAINTENANCE TO BE DONE

- ! **Any kind of cleaning or maintenance must always be done when the dock leveller is off and not supplied with power (disconnect the general switch of the control board).**
- ! **Any kind of cleaning or maintenance must always be done by qualified staff that have read and understood all safety standards of this manual and must be aware of any possible risk.**
- ! **Always use protection devices for personal safety as provided by the current rules.**
- ! **Never sprinkle water, damp or lubricated air on the electrical components.**
- ! **The non- or improper filling in of this form will decline any kind of insurance or warranty.**

WARNIING: For the screws tightening torque refer to the table at the end of the manual.

KIND OF SERVICE	RECURRENCE	DATE OF CHECKING	RESULT	SIGNATURE
Check of the functioning of the emergency stop	Before any start			
Check of the signalling stickers	Daily			
General cleaning	Once a week *			
Weekly check of the control board	Once a week (*)			
Check the conditions of mechanical parts and weldings	Every 3 months			
Check shield valve	Every 3 months(*)			
Monthly check of the control board	Every month			
Check oil level in the tank	Every 3 months			
Hinges, lips and level lubrication	Every 3 months			
Check of the cylinders	Every 3 months			
Check the sealing and the conditionse of the connections	Every 3 months			
Check the efficiency of the microswitches	Every 3 months			
Check screws tightening	Every 3 months			
Mechanical and electrical check of the control board	Not over 3 months-time			
Check integrity of the oil pipes	Once a year			
Replacing the oil in the control board	Every 2 years			
Replacing of the oil-pressure and flexible tubes	Every 5 years			

(*) this period of time has to be intended as maximum limit allowed; the operation can even be done more frequently and any time it is necessary.

Weekly check of the control boards: check voltage absorption of the temperature in the control boards, the airing efficiency of the control boards' coffers and of the room's, withour forgetting that the average temperature must not be over 30° C eand the maximum temperature not over 35° C.

Monthly check of the control boards: visually check all electric wires, clampings, boltings, terminals'lugs, active-, protection- and auxiliary circuits and the mechanical part with suitable dynamometric keys (see tables CEI EN 60947 – 1).

Check the conditions of mechanical parts and weldings: visually and carefully all mechanical parts and weldings so to make sure there is no imperfection (lacerations, bendings, cracks, sloughs, and so on); this check ha sto be done not later than every 3 months and before or after an intensive use of the dock leveller.

Check of the shield valve: check the cleaning, the proper position and the functioning.

Check level of the oil in the tank: the oil level can be controlled through a little bar, and its level has to be at ¾ of the tank (about 5.5 liters) when dock leveller is estende.
Replacing oil in the control board: olio duration depends on different factors, such as working hours, impurities and possible humidity. We suggest to replace the oil at least once every two years.

! **Always use the kind of oil suggested or one with similar features. The quantity is 5.5 litres.**

Check the efficiency of microswitches (if there is any)**:** for a good functioning of the dock leveller, especially to protect engine duration, check the electrical connections and the functioning of the limit switches. If a limit switch doesn't work you must replace it immediately.
Mechanical and electrical check of the control board: mechanically and electrically check the electric wires, the disconnecting switches, the magnet and thermic relays, the differentials, the control tools and all the other appliances. Make sure the safety circuits and the warning lights are appropriate (replace them at least once every 6 months). Make a general cleaning of the electric system with a suitable vacuum cleaner, a spray-brush and some deoxidizer for the contacts and the magnetic unit of the contactors. Completely clean the control boards with some paper or cloths by following the safety procedur on the appliance's dissection at the bottom of the power supply.

! **Cleaning the contacts, the switches the disconnecting switches and any other appliance with abrasive paper or with a file is strictly forbidden.**
! **WARNING: DUST AND COBWEBS FAVOUR FIRE PROPAGATION AND CAUSE SERIOUS DAMAGE AND INEFFICIENCY OF THE EQUIPMENT, SUCH AS VIBRATIONS, NOISES, BUZZINGS, CONTACTS STICKING AND WEAR AND TEAR, DAMAGE OF THE MAGNETIC UNITS AND OF CHAMBERS.**
! **The recurrence of the control board cleaning can vary and then must be more frequent in particularly dusty, humid and hard places (to be decided by the person in charge of safety).**

Check the sealing and the conditions of the connections: for a good and safe functioning of the dock leveller it is very important to make a careful control of the oil-pressure connections' tightening; in case you notice a loosening of the connections, tight them up again so to get a perfect sealing. In case of damage due to an accidental collision you must replace the parts
Check integrity of the oil pipes: in particular, you must check the sealing of the connections and the wear and tear: any possible cut or other kinds of damage due to accidental collisions impose the parts' replacing.

Replacing of the oil-pressure and flexible tubes: all over time the tubes might lose their initial performances , therefore it is important to replace them at least once every 5 years.

Check of the cylinders: in case of oil leaking replace the gaskets and check the stem: in case of any dent or other kinds of damage replace them.
Lubrication of hinges, lips and level: lubricate the hinges of the level very carefully.
General cleaning: dirt and foreign bodies on the dock leveller's moving parts may interfere with the good functioning or wear the hinges out.

! **Before any use of the dock leveller it is extremely important to make sure there isn't any foreign body or dirt that may obstruct the level's or the lip's movings.**

Check of the signalling stickers: check that the yellow and black stripes and the ones for the delimitation of the dock leveller's working-area (red stripes) on the level's sides and on the frame's lateral panels are well visible.
Check the functioning of the emergency stop: make sure the emergency stop works properly.

7. BREAKDOWNS AND REMEDIES

Please find here below all possible causes of malfunction and all checks and remedies to be undertaken.

! **WARNING: anytime a breakdown occurrs due to circuits, overvoltage or breakdowns at the ground, make all the necessary checks and inspections and take the necessary measures; remove the cause of the malfunction so that the initial features of the appliance are reset. Partly or entirely replace the appliance if necessary.**

! **In case the control boards have any trouble for overtemperature, buzzings, vibrations and noises, find the problem and remove it. In case you don't find the cause, contact the building firm by sending a written inquiry.**

! **Before doing anything, place visible signs indicating the works in progress.**

! **Finding breakdowns and possibly solving them must be done by qualified staff and with all the necessary precautions in order to not compromise people's safety.**

! **WARNING: turn voltage off through the general switch. If necessary, lift the level with the special eyebolts and clamp the prop properly.**

! WARNING: ARCO Industrie is always at disposal t ogive you any detailed information or suggestion.

Kind of break down	Possible cause	Remedy
Nothing works	a) Lack of voltage b) Broken fuse	a) Reset b) Reset
The dock leveller doesn't go up, the engine doesn't work.	a) The electric engine doesn't start. b) The electric engine is burnt c) The dock interblock started	a) Check the power supplì, the contactors and the overload cutout b) Replace c) Open the sectional door
The dock leveller cannot go up, while the engine works.	a) The phase of the power supplì is wrong, so the engine's rotaion direction is not right. b) There is a load or some bodies on the dock that prevent it from going up. c) The gear pump is broken d) The maximum-pressure valve is not set. e) Lack of oil. f) The pump-valves unit tube is broken or the connections are loose. g) The pump coupling joint is broken.	a) Invert power phases b) Take it away c) Replace the pump d) Re-set e) Tuck up f) Replace the tube or tighten the connections up or both. g) Replace the control board.
The dock leveller goes up slowly	a) The engine works with two phases or is undersupplied with power. b) The gear pump is worn out and doesn't give enough pressure. c) Oil leakages from a pipe. d) The maximum-pressure valve is working e) The pump filter is obstructed. f) The pump-manifold gasket is damaged. g) Leakages coming from the valves unit.	a) Check the electrical connection and the line voltage. b) Replace the control board c) Replace the pipe or tighten the connections up or borh. d) Re-set e) Dismantle the filter and clean it. f) Dismantle the manifold pump and replace the gasket. g) Check the tightening or replace.
The dock leveller doesn't go down	a) The electric valve doesn't get any power supply b) The coil of the electric valve is burnt c) The electric valve is blocked d) The maintenance prop is inserted e) The safety valve is blocked f) The control board doesn't work properly because the oil is too thick due to a temperature < -10° g) The dock leveller is against a mechanical resistance.	a) Check the electrical system b) Replace coil c) Dismantle and clean the lectric valve d) Disconnect the prop e) Check the shield valve f) Replace oil with another kind that suits lower temperatures. g) Remove obstacle
The warning light of the control board is off	a) The lampi s broken b) The electric valve doesn't get any power supply c) The coil of the electric val vis burnt	a) Replace lamp b) Check the electrical system c) Replace the coil
The dock leveller moves in bursts	d) There are foreign bodies in the front and back hinges e) The oil level is inadequate f) The dock leveller is against a mechanical resistance	d) Remove dirt and foreign bodies e) Put some oil in the tank f) Remove obstacle
The lip doesn't open	a) Lack of oil b) The electric valve doesn't get any power supply c) The coil of the electric valve is burnt	a) Make sure there are leakages and if so find and remove the problem. Tuck oil b) Check the electrical system c) Remove
It is impossibile toc lise the lip	a) The sequence and maximum-pressure valves are not set.	a) Reset
The li pgets opened but doesn't keep the position.	b) The sequence and maximum-pressure valves are not set.	c) Reset

8. PROCEDURE TO REQUEST THE SPARE PARTS

All dock levellers are designed and manufactured without the need of requiring spare parts, of course if they are used properly and by undertaking an adequate maintenance as shown in this manual. All parts that can be worn out are written in a list of spare parts in this manual.
In case of need, replace the worn-out or damaged parts. Only original spare parts are allowed, so send a request to :

ARCO Industrie s.r.l.
Via Valtesino Km 4,500 - 63065 Ripatransone AP - Italy –
Ph.: (+39) 0735/907711 Fax: (+39) 0735/907799
e-mail: postvendita@arcoindustrie.it – www.arcoindustrie.it

Re	PART NUMBER	DESCRIPTION	NOTES
1	6ETB00100	Buffer-holding plate	
2	430011100	Rubber buffer Model 5TM040II	
3	5ECE00001	Oil-pressure control board	
4	4PI000041	Bore PISTON 60 Stem 40	Piston for level lifting
5	4PI000027	Bore PISTON 40 Stem 25	Piston for lip moving
6	4TU000022	Kit for joined Flex tube D 3/8” L 600 mms	With 2 pierced bolts and 4 BoltSeal gaskets
7	4TU000014	Kit for joined Flex tube D 1/4” model “A”L 1100 mms	With 2 pierced bolts and 4 BoltSeal gaskets
8	4TU000013	Kit for joined Flex tube D 1/4” model “B” L 1100 mms	With 2 pierced bolts and 4 BoltSeal gaskets
9	4VA000001	Shield valve with 3/8” BSPP	
10	XP0609020	Electric control board for Dock leveller	
	421SH0015	Shell Tellus Oil T15	
	348900021	1/4" BoltSeal gaskets	
	348900023	3/8" BoltSeal gaskets	
	33T11STGN	Yellow/black stripe	

! **NN: the use of unoriginal spare parts declines any form of insurance or warranty and may compromise the good functioning of the dock leveller.**

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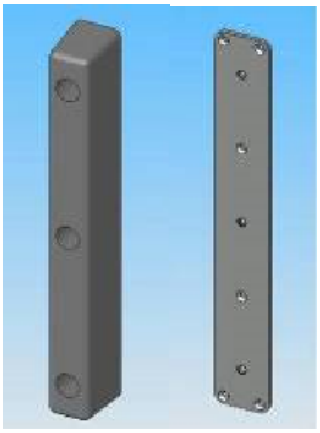

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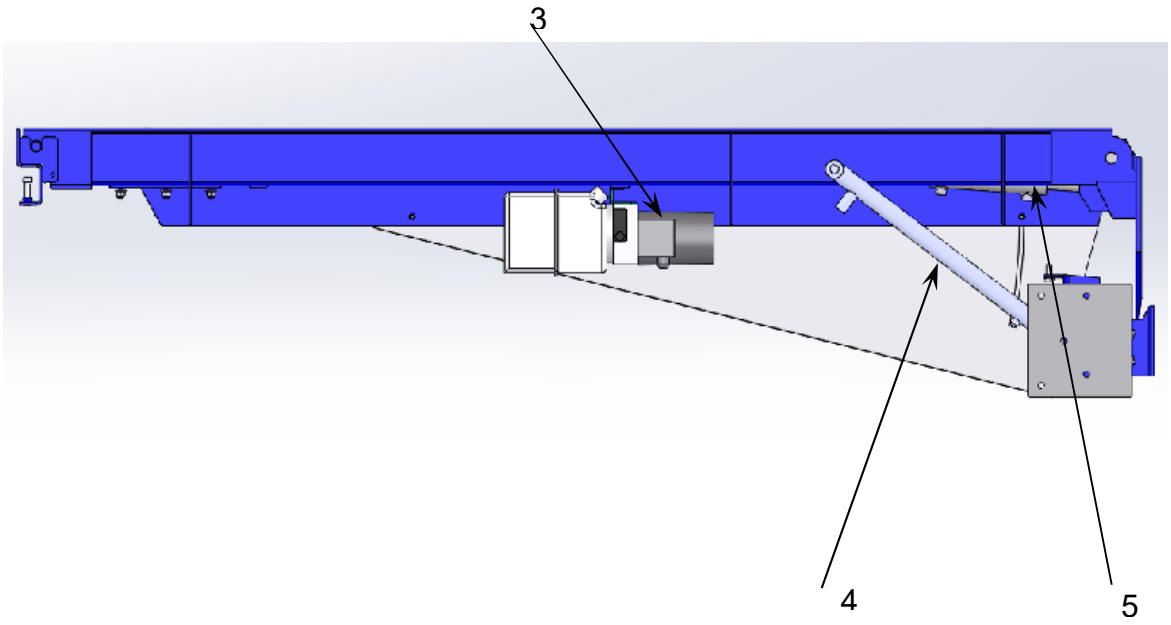

9. PRE-LOAD AND TIGHTENING TORQUES

The following table refer to metric screws, class 8.8 with triangular and coarse thread. Considering a friction coefficient μ = 0.15 and a load amounting to 75% of the screw elastic limit.

DIAMETER	**PITCH** (mm)	**SPANNER SIZE** (mm)	**PRELOAD** (N)	**TIGHTENING TORQUE** (Nm)
M 3	0,5	5,5	2075	1,21
M 4	0,7	7	3594	2,78
M 5	0,8	8	5886	5,5
M 6	1	10	8302	9,5
M 8	1,25	13	15242	23
M 10	1,5	16	24275	46
M 12	1,75	18	35401	79
M 14	2	21	48618	127
M 16	2	24	66955	198
M 18	2,5	27	83746	283
M 20	2,5	30	107941	402
M 22	2,5	34	134806	552
M 24	3	36	155489	691
M 27	3	41	204577	1022
M 30	3,5	46	248811	1387
M 33	3,5	50	310343	1884
M 36	4	55	363972	2418
M 39	4	60	437669	3139
M 42	4,5	65	500694	3872
M 45	4,5	70	586548	4847
M 48	5	75	658966	5849

Attention: If the connection has been made using ring nuts or self-locking nuts increase the tightening torque by 15%.

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