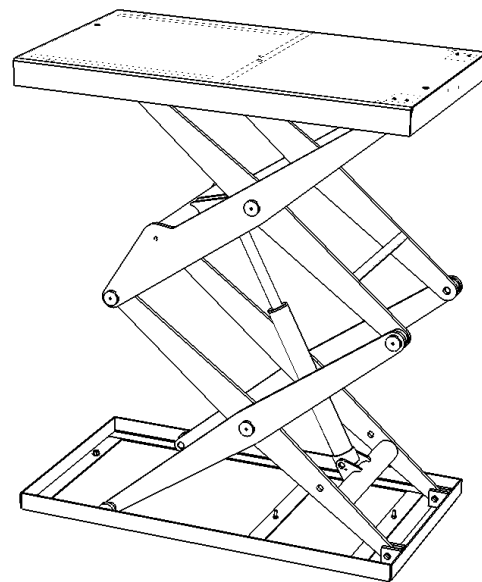
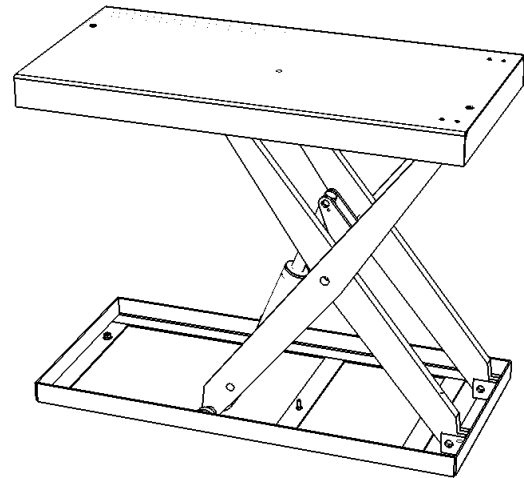
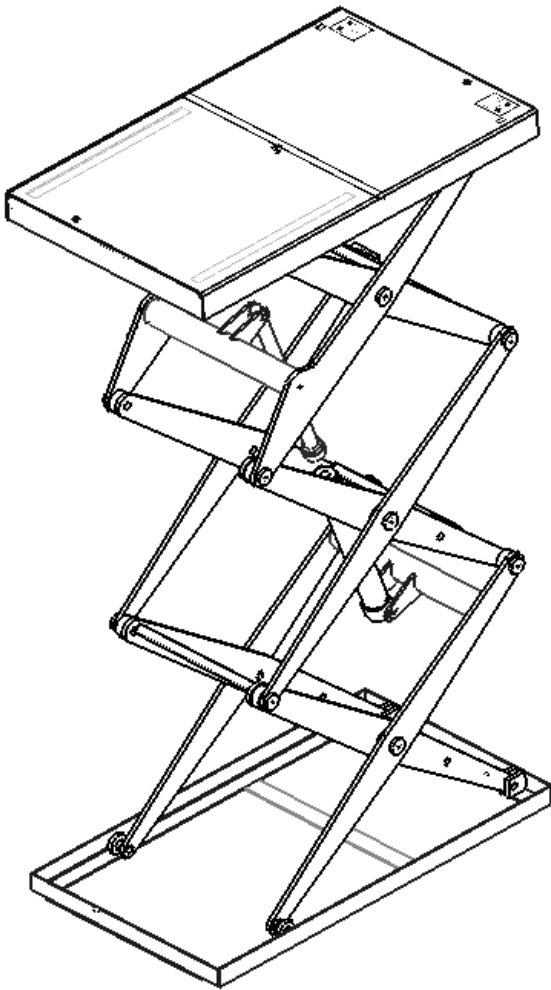


Scissor lifting tables

Technical description Nr. 8805



armo

Descrizione tecnica
Armo s.p.a.

Born in 1972, Armo developed day by day, with the quality of their production, the efficiency of their industrial organization and the experience of their personnel.

Today Armo is an industry with an international and experimental vocation. It is leader of the Italian market and it has a vast range and variety of machines for the lifting, maintenance and loading point.

COMPANY PROFILE YEAR 2008

Name of the company:	Armo s.p.a.
Date founded:	1972
Capital stock:	€ 1.600.000
Business:	Dock levellers, lifting tables, tippers.
Sales:	€ 13.000.000 ca.
Armo group collaborators:	50 ca.
Banks:	Istituto Intesa – San Paolo IMI Unicredit Banca D'Impresa CRT Asti

The managing staff

Another strong aspect about Armo is surely its staff, who is able to manage all the suppliers, the customer orders, the production planning, the accountancy management, the shipment and the after-sale departments. The company, thanks to the new computer web, new managerial programs and the preparation of its staff, is in a position to supply fast and exhausting answers to any problem the customer can submit.

According to the sales and after-sales service, we grant the availability of at least one of the following people to answer your requests:

Deborah Corgiat - Manuela Cifarelli (tel. +39.011.71760.20),

For commercial requirements: commerciale@armoweb.com

For production and delivery: prod@armoweb.com

Web site www.armoweb.com

Direct fax number: +39.011.77.277.70

ARMO S.p.a
Sales and technical dept.

Chapter 1 – Capacity of production

In Armo, everything is organised in order to guarantee a safe, quick and effective production. We work within wide spaces (over 14.000 sq. m) in which raw materials and components can be stored, processed and assembled. It's thus possible to work in optimal conditions, by taking care of all the work-phases thanks to an impressive system of 18 overhead travelling cranes combined with 8 fork-lift trucks.

Every single phase, from the exclusive design to the cutting of raw materials, from the assembly to the testing – is performed in our plants, by guarantee an absolute control of production and a continuity of quality.

In order to simplify Armo's production force, we can subdivide it in 5 parts:

- **Stoking plant.** It receives all the semi-finished goods which will be used to compose our products. The semi-finished goods are prepared in series, with obvious savings on the working costs. They are stocked and therefore used when necessary. The warehouse of the semi-finished goods is the foundations of our productive flexibility, guaranteeing the immediate availability of any necessary piece.
- **Special goods plant.** Armo produces its “special” goods in this plant. Our 30 years long experience in the manufacturing of lifting tables with special dimensions, reaches its maximum application in this plant: any special request the customer should submit is successfully and quickly faced and solved.
- **Semi-finished goods and mass production plant.** This plant is the feather in Armo's capacity of production cap. With its 10 robots, it can face any remarkable size of work. An automated robot plant, by repeating cycle by cycle the exact sequence of the operations, guarantees that all manufactures have got the same features and these features are maintained over time time. Only by the automation of the producing process, it is possible that the quality level keep being constant. The quality guarantee, which has always been considered a primary aim of Armo's production, has become a standard with the robots usage.
- **Testing plant.** Each Armo's product is tested using rigorous procedures. The results of the final test on each part produced are carefully recorded, together with a detailed list of the used components, in special files which, over time, will be useful for the reproducing of the exact “identikit” of each piece of machinery. For Armo's customers, it will never be a problem to get a spare-part.
- **Warehouse and shipments.** A total covered surface area of 3000 sq. m., in which 4 complete trucks can be loaded at the same time. About 400 dock levellers and 500 lifting tables can be stocked on average. Thanks to this warehouse Armo can easily manage all the changes in production and all shipments forwarding.

Chapter 2 – References regulations

For the lifting tables, the European Rule is the **EN 1570**, approved by the CEN (Regulation's European Committee), on May the 7th, 1998 and published in the GUCE (Official Gazette of the European Community), on October the 15th, 1998. According to the introduction of the above mentioned regulation, it has become a national regulation in all the countries which adhere to the CEN since November '98 and that all national regulations in conflict had to be withdrawn within that date.

The CEN members have to follow the common rules of the CEN/CENELEC which define the procedures according to which the status of national regulation has to be conferred to the European regulation **without making any modifications**.

This regulation has to be followed together with the other regulations above listed:

EN 292	Safety of machinery, basic concepts, general principles for design Part 1 : Basic terminology, methodology Part 2 : technical principles and specifications
EN 294	Safety of machinery: safety distances to prevent danger areas being reached by the upper limbs
EN 349	Safety of machinery: minimum distances to avoid crushing of parts of the human body.
EN 414	Safety of machinery: rules for draft or preparation of standards.
EN 418	Safety of machinery: emergency stop equipment: functional aspects.
EN 563	Safety of machinery: temperature of the reachable surfaces.
EN 954	Part 1: Safety of machinery: safety details of the control systems – general code for planning
EN 982	Safety of machinery: safety conditions related to systems and their components for hydraulic and pneumatic transmissions.
EN 60204	Part 1: Safety of machinery: machines electrical equipments, general rules
EN 60529	Degrees of protection: protection of electrical equipment against contacts, foreign bodies and water.
EN 60947	Lower tension switches and control devices: part 4-1, electromechanical counter and starter – motors
HD 419.2	Lower tension switches and control devices: semiconductors
HD 364	Electrical appliance; part 4; safety protection; chapter 41; protection against electrical hurts
HD 364	Electrical appliance; part 4; safety protection; chapter 47; safety protection measures

Besides, the EN 1570 confirms the basic conditions of the following UE Laws:

2006/42/CE Machine Regulation

(dtd. 17th May 2006 – in substitution of 98/37/CE rule of the European Parliament – called “ machines regulation” – publed on the Official Gazette dtd. 7/12/1998, with reference to all machines and all safety components sell alone on the market – and at its turn it modified the rule 89/392/CEE of the council, dtd. 14/06/1989)

2006/95/CE Low voltage regulations

2004/108CE EMC electromagnetic consistency regulations

DRAWINGS - TECHNICAL BOOKLET

For each structure a product's technical booklet concerning structure calculations and used securities is provided.

The technical booklet is available on request by the authorized control Authority to verify the conformity of products to the security conditions.

LIST OF RISKS

The lifting tables are equipped with all the safety devices in order to overcome any risk, as much as possible.

The risks and the solutions concerning the lifting tables are listed in the safety requirements.

Chapter 3 – Technical features - structure

TECHNICAL FEATURES

The “lifting table” is a fix lifting device hydraulically operated. It is measured to support uniformly, partially distributed and/or concentrated loads in movement, such as fork lifts.

It has an upper frame, a lower frame and a pantograph system, operated by one or more cylinders.

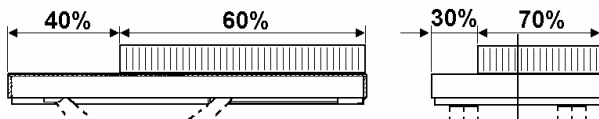
The upper frame has made with a covering in smooth or diamond plate and it has a vertical movement in parallel with the floor. The pantograph is hinged in an end part of the lower and upper frame. The other end of the pantograph slides on wheels in proper horizontal tracks obtained in the upper and in the lower frame.

The lifting table has got one self-carrying en-block structure and it's equipped with threaded hooks for the lifting and its installation provided for the purpose. Proper props are foreseen in order to allow the maintenance inside the lifting table.

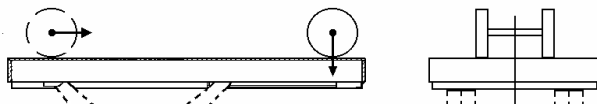
The cylinder/s is/are controlled by an hydraulic power-pack. On each cylinder two safety valves are mounted: a balanced limited device which, in case of the breaking of the tubes, even if the down-stroke control is operated, it could allow the down-stroke of the lifting table at a controlled speed; a sphere seal solenoid-valve to avoid oil blow-by and guarantee the positioning at the floor. The hydraulic installation on the lifting table ends with a proper pipe union welded on the lower frame.

The electrical system on the lifting table (including safety perimeter, up-stroke limiting device and the solenoid valve/s cables) in the inside power-pack version is connected to the table, in the outside or excluded power-pack version it ends in a proper shunt box which is fixed to the lower frame.

Load distribution (according to models)



Type 200: Partially distributed load. . It is not foreseen the entering to the frame of equipments for moving goods (forklifts, trans-pallet)



Type 300: Partially concentrated load in motion towards the longitudinal axis. The translation of a load is foreseen with the distribution of 50% of the weight per axis.



Type 400: Concentrated load and in motion in every point of the frame. The translation of a load is foreseen with fork lift. In this case the 90% of the load charges on the 2 rear wheels

Using conditions

The lifting table must be only used to raise or low loads; another usage, as for example for compressing or stretching, is considered not up to the using.

Loads must be applied on the table in a way that it could avoid unexpected changes of their position. The load must be laid, it must not be hanged up or stuck out of the upper frame rest area.

Chapter 4 – Technical features – Hydraulic power-pack

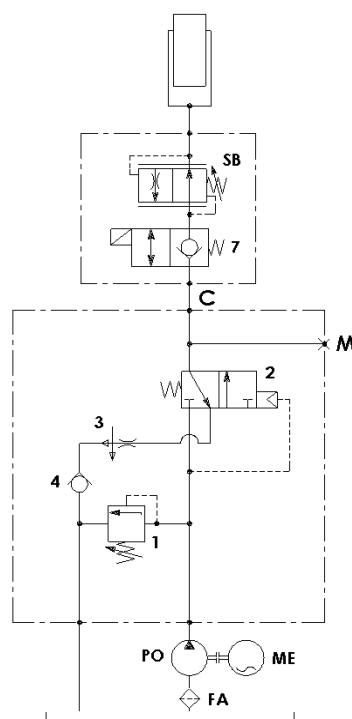
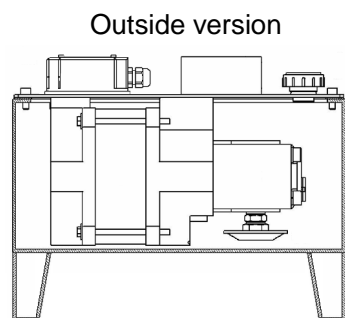
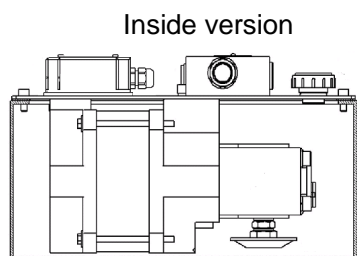
HYDRAULIC POWER PACK WITH PLUNGED MOTOR

The main advantages of the plunged motor power-packs are: the high consistency, the perfect cleaning, the perfect noiselessness, the lower maintenance and, as the components are plunged in the oil, a longer duration.

The feeding tension is for intermittent use (maximum 30%). The power pack can be placed inside the lifting table. When it is placed outside the lifting table, it is supplied with a flexible pipe L= 3 mt for the connection to the pipe union, which is welded on the lower frame of the lifting table.

The up-stroke speed is fix, it doesn't depend on the load of the lifting table – the down-stroke speed is adjustable by a self-balanced mounted on line limited device, which allows a constant speed (with a 5% tolerance) which doesn't depend on the load of the frame.

The hydraulic group is completed with an anti-emptying valve. If the frame is mechanically blocked, even by operating the down-stroke push button, the cylinder keeps being full of oil.



Hydraulic power pack 230/400V 50 Hz three-phase						
Inside model	Outside model	Power [HP]	Power [kW]	Pump [l/min]	Outside dim. mm (Lu×La×H)	lt. Tank oil
CAAI10V17	CAAE10V17	1	0,75	3,55	440x310x470	12
CAAI20V17	CAAE20V17	2	1,5	5,7	440x310x470	12
CABI40V20	CABE40V20	4	3	12,2	520x310x570	26
CABI50V20	CABE50V20	5,5	4	14,6	520x310x570	26
CABI70V20	CABE70V20	7,5	5,5	23,1	520x400x700	55

Hydraulic power pack 230V 50 Hz mono-phase					
Inside Model only	Power [HP]	Power [kW]	Pump [l/min]	Dim. (Lu×La×H) mm	lt. Tank oil
CAME10V17	1	0,75	3,55	440x310x470	12

Chapter 5 – Technical features – Electrical part

Cod. CC0 Electrical system excluded

We only supply the shunt box which is fixed on the lower frame of the lifting table. In the box the perimeter limit switch, the up-stroke and down-stroke limit switch cables and the solenoid valve (one or two) cables end. We remind that the electrical protection, both according to the circuit and if there is a 2 cylinders lifting table, the lifting table block, in the event of failure of one of the 2 solenoid valves, is at the customer care.

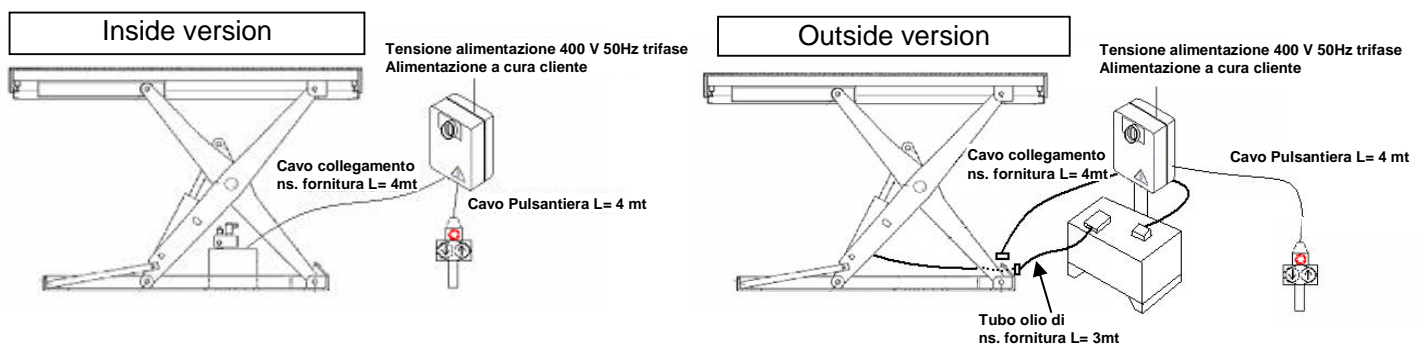
Cod. CD00 - Emergency device for lifting tables without electrical control

It is a small square placed on the power-pack with a push button for operating the lifting table only during the down-stroke in the event of lack of electric power. The device is fed by plug batteries which have to be charged by a 24V feeding. After a possible use, for the battery recharge, 24 hours are necessary before being able to effect another urgency down-stroke. We supply the “electrical” protection on the cylinders both according to the circuit and if there is a 2 cylinders lifting table, the lifting table block, in the event of failure of one of the 2 solenoid valves.

Cod. CQ00 - Electric board without emergency device

The electrical board is supplied with a push button panel with 2 buttons (up-stroke/down-stroke with dead man) plus emergency mushroom button; the following configurations are foreseen:

- In the inside power-pack version, it is supplied external and for fixing at wall; a shunt box is connected to the electric box where safety perimeter, up-stroke limiting device, and the solenoid valve/s cables end.
- In the outside power-pack version it is placed on the hydraulic power-pack. A shunt box is connected to the electric box, where safety perimeter, up-stroke limiting device, and the solenoid valve/s cables end.



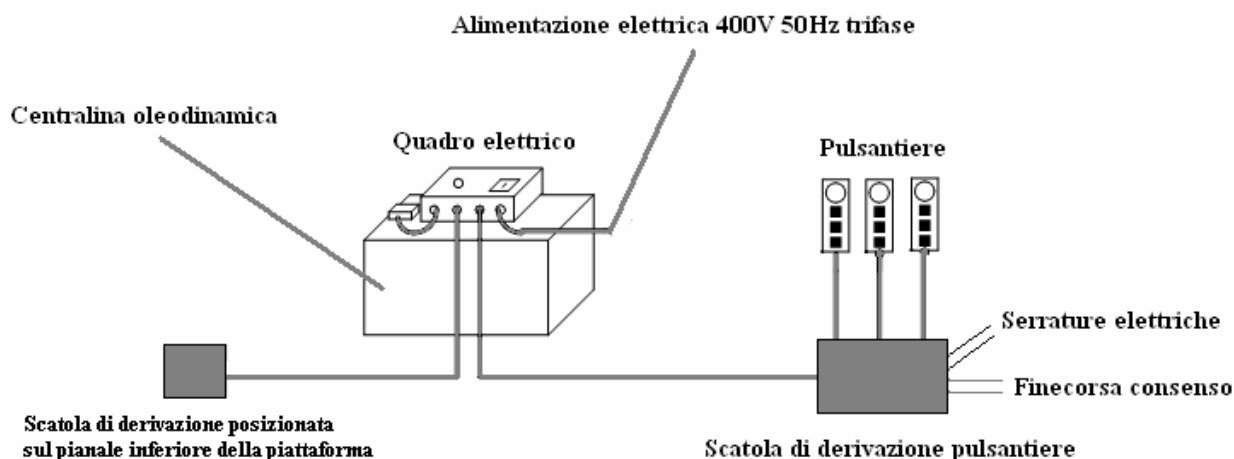
Cod. CQD0 – Electric box with down-stroke emergency device

The electric box is supplied as Cod. CQ00 but equipped with the emergency device as the Cod. CD00

In case of two floors connecting lifting tables, the electrical part is offered with the following additional options:

Cod. MQ00 - Control box (push button panels not included)

The control box is placed on the power-pack and it includes the emergency device and the above mentioned safety measures. A shunt box is connected to the control box where the customer can connect from one to three push button panels, two electrical locks and two limiting devices. The connecting cables between control box and shunt boxes are included. The push button panels, the electric locks, the limit switches and the control box feeding, are not included.



Cod. MQ0B – Control box with “use and throw it away” push button panel

The electric board is the same as indicated in the drawing, but with a push button panel to be used during the installation phases. The push button panel has to be taken off, and it can be recovered for possible future installations.

Cod. MQ02 o MQ03 – Control box with push button panels

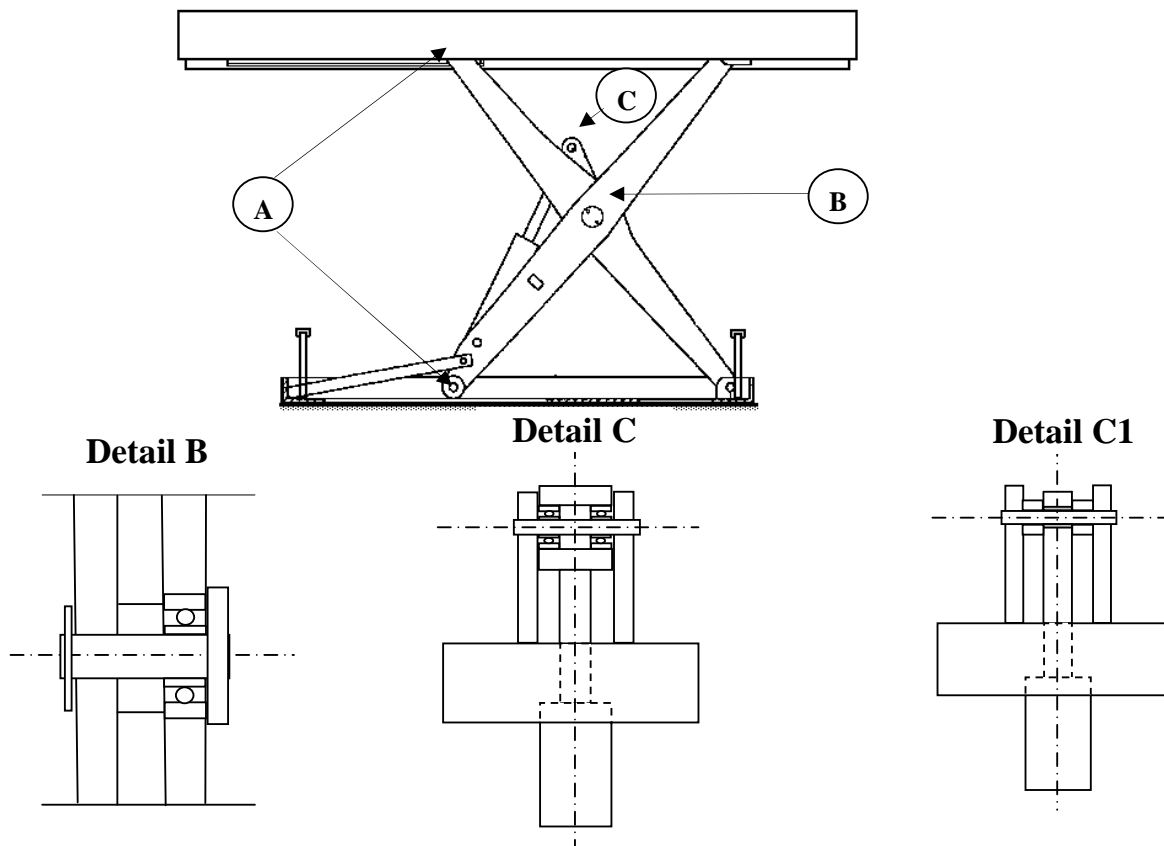
Electric board as MQ00, but equipped with 2 (MQ02) or 3 (MQ03) push button panels. The push button panels are industrial type (Mark TER) and are equipped with hangers for the wall fixing or to be hanged up; they are not very indicated for embedding in a wall. Each push button panel is equipped with a 10 meters cable and has got 4 push buttons: up-stroke, down-stroke, emergency stop and main switch. By pushing the up-stroke/down-stroke push button, the lifting table effects the complete lift.

Chapter 6 – Lifting tables for continuous use - Structure

Thanks to our experience developed by supplies to producers of automated plants, we manufactured a lifting table version which is suitable for a continuous usage.

This structure has been dimensioned and fortified for using with a high number of cycles (major about 100 per day) and it foresees the following points:

- **A** Upper and lower sliding on bearings.
- **B** Bearings in the central hinges.
- **C** Bearings in the cylinder upper joint hinges.
- **C1** For tables with a simple pantograph with a capacity of kg. 500 – 1000 – 2000 and a maximum lifting height of mm. 1000 – because of the reduced spaces, in the upper cylinder joint, a bush, composed by modified polyester with a good load capacity and, thanks to the lower friction factor, a good resistance against the wear, is foreseen.



ATTENTION: for the functioning with more than 30-35 cycles per hour it is necessary to foresee: an hydraulic power pack with outside airy motor and the hydraulic diagram with always rotating motor – see chapter 7.

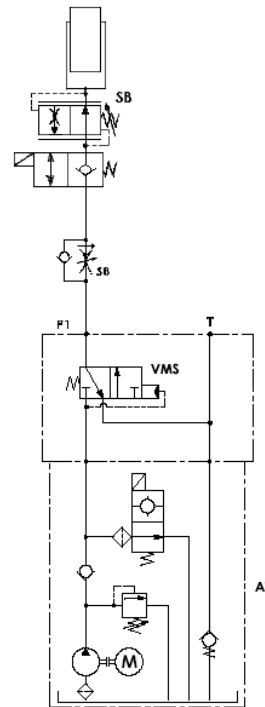
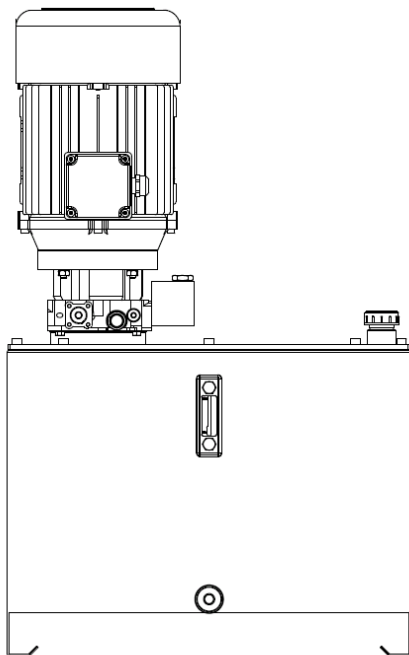
Chapter 7 – Lifting tables for continuous use – External engine hydraulic power-packs

This version is suitable for tables which are included in automatic cycles or anyway with a high number of cycles (as per a raising jerkily) more than 30÷35 starting per hour – it is composed by:

- Outside airy motor
- Tank with a major oil capacity to avoid the overheating
- Position of the hydraulic power pack only outside the table because of the bigger dimensions as above indicated and so it is supplied with flexible tube L= 3 mt for the connection to the union which is welded on the lower frame of the lifting table.

The raising time is fixed, independent from the load which is on the table – the lowering time is adjustable by a choke limited device, mounted in line and which allows to have a constant speed (with a tolerance of 5%) independently from the frame load.

The hydraulic group includes an anti-emptying valve. If the frame is mechanically blocked, even if you push the lowering button, the cylinder will always remains full of oil.

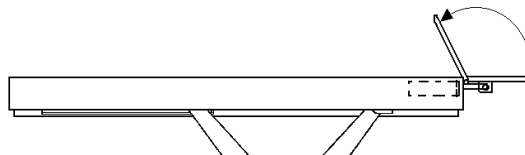


Hydraulic power pack 230/400V 50 Hz three-phase

Mod.	Power [HP]	Power [kW]	Pump lt/min	Outside dim. mm (Lu×La×H)	lt. Tank oil
C71E20Z72	2	1,5	5,7	540x350x750	36
C71E40Z72	4	3	11	540x350x860	36
C71E50Z72	5,5	4	13,8	540x350x900	36

Chapter 7 – Optionals

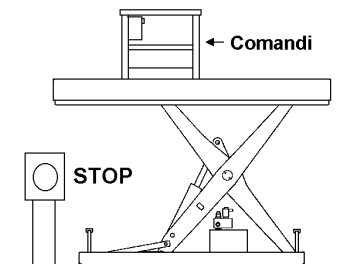
Cod. CS0 – Manual or hydraulic loading lip. The hydraulic lip which is hinged on the upper frame for connecting the table/truck body, is made in sectors (central mm 1000 and laterals mm 200/250) with length 400. This lip is manually or hydraulically operated by an hydraulic cylinder.



Cod. CT0 – Trucks transit. It is a strengthening of the lifting table upper frame so that, when it is closed at the floor level, it allows the trucks transit of a total weight of 15 Tons.

Cod. CF0 – Controls fixed on the upper frame. As for this kind of tables also the operator raising is foreseen, it is necessary to guarantee the acquitting of the obligatory additional safety requirements of the EN 1570 rule that foresees:

- In proximity of the control, a safety area for the operator near the controls at least at 0,5x0,6 mt should be foreseen.
- The control must be fixed on a railing at the high of about 1.100 mm
- Besides the control which is placed on the lifting table frame, there is a supplementary emergency stop to be fixed to the ground on a column or at a wall.



Cod. PA0 - Parapets. Even if it is not foreseen by the EN 1570 regulation, in particular danger conditions the installation of parapets **H 1100** is necessary on the needed sides. Even access gates with electrical locks are available.

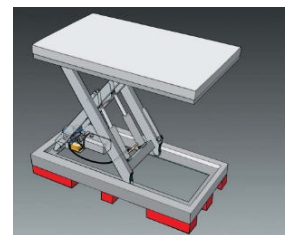


Cod. CE0 – outside zones treatments

The standard lifting table is not foreseen to be installed in not-covered places, under bad weather, even if power-pack and control box are placed in a protected area.

We can provide a metallization process with the following features:

- Carpentry sandblasting
- Primary spraying galvanization with covering in polyurethane Grey RAL 9007 finishing
- Cylinder drainage to the power-pack

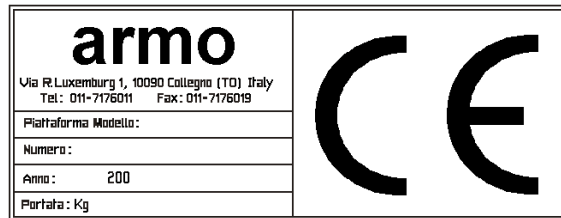


Cod. SP0 – In order to easily displace the lifting table by trans-pallet or forklifts, the structure can be equipped with a shimming of 120 mm. The maximum dimensions of the lifting table are 2500 x 1200 mm. Besides, we also produce lifting tables on steel wheels with vertical sliding on rail, both idled or motorized.

Many other optional on demand: hydraulic pins, access doors, additional breaks, centering trucks, telescopic anti-fall protections, sloping frame, special engine tensions, up-stroke/down-stroke automations, etc.

Each lifting table has been produced according to the present European safety regulations.

In case of a supply of a lifting table complete with power-pack and control box, every machine will have permanently fixed on itself an identification plate, such as the one shown in the picture below.



In this case, for each equipment a conformity declaration is provided, following the UNI CEI EN ISO/IEC 17050 - 1:2005 e UNI CEI EN ISO/IEC 17050 - 2:2005 European Regulation. In case of incomplete supply, or of two floors connecting lifting table, a "Manufacturer's Declaration" is provided.

If all provisions specified in this booklet are going to be followed, no health hazards will exist, according to the present regulations.

For each machine a testing annual certificate is provided after the installation.

Without Armo's written authorization it is forbidden any modifications which could jeopardize its safety.

The improper use, the tempering of the safety devices, the lack of maintenance or interventions effected without following the written procedures or by not qualified workers, cause "the disclaiming of responsibility by ARMO s.p.a." and the automatic lose of any form of insurance or warranty.

GUARANTEE CERTIFICATE



We declare that every component is preliminarily tested before the assembling and each machine is meticulously tested before the delivery.

We therefore guarantee, that every equipment is free from functional lacks when it leaves our factories.

1

All our machineries are covered by a 2 years guaranty.

2

The ready-made components used in our machineries, for example the power packs and the control boxes are covered by the guarantees of their own manufacturers.

3

The guarantee, is the complete, cost -free, replacement of the machine's components which present faults of manufacture.

4

All parts which present faults due to negligence or carelessness over use (lack of observation of the equipments working instructions), installation errors, or maintenance which has not been carried out according to the use and instructions manual, or has been carried out by unauthorized personnel, damages during the transport, or circumstances which may not be traced back to faults of manufacture, are not covered by guarantee.

5

The manufacturer declines all responsibility for possible damages caused, either directly or indirectly, by people, things or animals, as a consequence of a lack of observation of all of the regulations indicated in the instruction booklet, especially concerning the warnings regarding the installation, use and maintenance of the machine.

6

This guarantee does not cover personnel's transferral and transport freights.

LIABILITY INSURANCE POLICY FOR INDUSTRIAL COMPANIES



ARMO is covered by guarantee should they be subjected to requests of compensation for damages to third parties, caused by the company's products, once these have been delivered.

This guarantee includes design faults, manufacture faults, errors in the editing of the instructions for use, and packing defects.

Damages to the finished product (the products, being inseparable components of other products), which cause damages to another component or to the finished product, are also included.

Damages to the products which are partially made up insured product.

- | | |
|--|-------------|
| • Maximum per INSURANCE YEAR
and for SERIAL ACCIDENTS | € 2.500.000 |
| • Maximum per ACCIDENT | € 2.500.000 |
| • Limit for damages for
INTERRUPTION OF ACTIVITY | € 1.000.000 |



IN ACTUATION OF THE EEC REGULATION 375 OF 1985

"R.C.O." insurance is also valid for compensation made by the "INPS" (Istituto Nazionale per la Previdenza Sociale = Department of Social Security), in accordance with Art. 14 of Law n.222 of the 12th June, 1984.

All goods features can be modified without any warning. Errors and omissions excepted.

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