



## PRESSURE SILO

mod. *05D15000A30P5400C3S3*

**Factory No.**

**USE AND MAINTENANCE MANUAL**

**FIORE Impianti S.p.A.**

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**Before operating on the silo, read this manual carefully.**

The manual was drawn up by **FIORE IMPIANTI S.p.A.** and must be made available to those who load, transport, install, use and maintain the silo. The manual is part of the product and must follow the silo until it is dismantled (even with a possible change of owner). It must also be available at the site for quick consultation by the operators and the Works Supervisor. If the manual is lost, request a copy indicating: Buyer's Details. Silo model. Factory No., Year of construction.

**0. GENERAL INFORMATION****0.1. WARNINGS**

The safe use of the silo is guaranteed only for the functions, materials and mortars listed in these instructions for use. **FIORE IMPIANTI S.p.A.** does not consider itself responsible for the effects of the safety, reliability and performance of the silo in the event that the warnings and suggestions contained in this manual are not complied with, with particular reference to the activities of loading, transport, installation on site, use, ordinary and extraordinary maintenance, repair, stability check, dismantling. The manufacturer is relieved of all liability in case of: improper use; use by inadequately trained personnel; use contrary to what is established in this manual; use contrary to current regulations and legislation; use with modifications or interventions not explicitly authorized by the manufacturer; use with non-original spare parts, for spare parts normally available on the market, which do not correspond to the relative product standards.

Any electrical connection must be made to a power supply network protected in compliance with the safety standards in force, checking the correspondence of the data on the plate. With regard to the auxiliaries (mixers, aerators, etc.) connected to the silo, the user electrical system must comply with the relevant applicable IEC standards, in particular with IEC 64-8 standards. The manufacturer declines all responsibility if the protection devices have not been installed upstream of the silo, coordinated so as to guarantee automatic interruption of the power supply in compliance with the provisions of the aforementioned standards. In relation to the plant site, the user will have to evaluate the need to electrically connect the silo to ground, to protect against atmospheric discharges via the appropriate grounding plate located near the ground support on one of the legs .

**We remind you of the obligation for the user to always keep the warnings and signals on the silo legible. Before carrying out any operation with the silo, make sure that there are no people or other obstacles around the work area which could be a source of danger during the activities. The operator is prohibited from carrying out operations reserved for qualified personnel.**

## 0.2. BEFORE OPERATING ON THE SILO

To allow rapid identification of the professional subjects interested in reading this manual, definitions with the following meanings have been used for the pertinent chapters:

**OPERATOR:** generic operator, in charge of using the silo for production purposes; it is aware of the measures taken by the silo builder in order to eliminate the sources of risk of accidents at work and complies with the operational constraints.

**BRICKLAYER:** as above with the qualification of bricklayer too.

**TRUCK DRIVER. EXCAVATOR OPERATOR, SLINGER:** truck driver specialized and trained on what is described in this manual as well as that concerning the use of the truck and the special equipment for lifting, loading and unloading the silo.

**TANKER DRIVER, EXCAVATOR OPERATOR, SLINGER:** tanker driver specialized and trained on what is described in this manual as well as that concerning the use of the tanker and the specific equipment for refuelling the silo.

**MAINTENANCE TECHNICIAN:** operator with the qualification of maintenance technician able to safely carry out the extraordinary maintenance operations indicated in this manual.

**ELECTRICIAN:** operator with the qualification of electrician in charge of making the connection to the site electrical system.

## 0.3. WARRANTY CONDITIONS

The new product is covered by a 12-month warranty for manufacturing defects, starting from the delivery note date; the guarantee covers only the replacement of defective parts or components, ex works. During the warranty period, **FIORE Impianti S.p.A.** undertakes to supply the parts or components found to be defective free of charge. The following are excluded from the warranty: accidental breakage due to transport, use not complying with the instructions in this manual or negligence; malfunctions deriving from incorrect installation or use non complying with the indications of this manual; the product repaired or manipulated by third parties unless expressly authorized by FIORE Impianti S.p.A.

Upon delivery, the Purchaser must check the product and make sure that it shows no signs of damage and that the supply is complete. Any damage must be reported immediately to the carrier, with a written note countersigned by the driver. The general sales warranty is void in the event of: poor conservation and maintenance, problems due to incorrect installation or use of the powders, inexperience of use, tampering with parts or components, exceeding of the limits of use, excessive mechanical stress (particularly during transport and installation).

## 1. INDICATIONS PROVIDED FOR IDENTIFICATION

### 1.1 DATA PLATE

The silo has an identification plate which shows: type, factory number, CE marking, year of construction, manufacturer, etc. These data must necessarily be stated for any warranty, spare parts or any communication regarding the silo.

		<b>FIORE IMPIANTI S.P.A.</b> <b>VIA G. PASCOLI, 1/C</b> <b>I - 36065 MUSSOLENTE (VI)</b> <b>TEL. 0424 578711 – FAX 0424 577552</b> <b>http: www.fioreimpianti.it - E-mail: Info@fioreimpianti.it</b>	
		<b>SILO PER MALTE E INTONACI PREMISCELATI</b>	
Tipo Apparecchio		Volume V - L:	
Anno di Fabbricazione		Temperatura TS -°C:	-10° + +50°
Nr. Fabbricazione		Pressione massima ammessa DS.har	2
<b>CE 0100</b>		Pressione di prova idraulica PT.har	2.9

## 2. DATA CERTIFYING THE QUALIFICATION OF THE PRODUCT

### 2.1 DESCRIPTION AND USEFULNESS OF THE SILO

The pressure silo is a device for the transport, storage and supply of construction equipment and machinery for mortars, plasters, limes, chalks, screeds and the like. It consists of a framed support structure made of tubular steel that hold up the container itself, which is also made of steel. This container consists of a cylindrical body closed at the ends by a convex bottom at the top and by a truncated cone at the other. The reduction cone which carries the product shut-off ball valve is connected to the smaller end of the truncated cone by means of nuts and tie rods. The use of an integrated system of vehicles, silos, construction equipment allows considerable time savings and consequent cost reductions. In particular, the use of silos allows the easy transport of large quantities of materials, completely avoiding the manual handling of the products and their dispersion in the environment.

### 3. CHARACTERISTICS OF THE SILO

#### 3.1 TYPOLOGICAL AND DIMENSIONAL CHARACTERISTICS, TECHNICAL DETAILS

SILO MODEL	TOTAL HEIGHT (cm)	DIAMETER (cm)	EMPTY MASS (kg)	NOMINAL CAPACITY (m <sup>3</sup> )	TYPE OF LIFTING HOOK
14D2000A30MT	640	200	1900	14	TWO POCKETS
18D2400A38PE	624	240	2300	18	ONE POCKET
18D2400A38MT	644	240	2300	18	TWO POCKETS
20D2400A38PE	674	240	2350	20	ONE POCKET
20D2400A38MM	665	240	2750	20	TIE RODS
20D2500A38MT	640	250	2400	20	TWO POCKETS
20D2500A38NB	664	250	2700	20	UPPER HOOK
22D2400A38PE	724	240	2400	22	ONE POCKET
22D2400A38PEAD	724	240	2900	22	ONE POCKET
22D2500A38MT	680	250	2500	22	TWO POCKETS

#### 3.2 ACCESSORIES

**Manhole:** the pressure silo has a manhole closed by three handles and used for loading the silo in the production site or for internal inspections. The tightening torque of the handles must be 60 Nm. For a correct closure of the hatch, the indicated value must not be exceeded. For this purpose, use a torque wrench and not other types of unsuitable tools (hammers, mallets, pipes, etc.).

**Load group:** it consists of a 114 mm diameter tube ending on the external side with a flange closed by the relative counter-flange, with an interposed rubber gasket and by means of four M18 tie rods with the relative nuts.

**Vent group:** similar to the previous one, it is characterized by the presence of a sleeve placed near the flange and containing the pressure control group and the safety valve.

**Cone reduction group:** through a truncated cone reduction, a 2 ½ ball valve and a Stortz connection it allows to intercept the material and connect the various equipment directly to the silo.

**Pressure gauge unit - safety valve:** it is connected to the vent unit and the pressure gauge (with full scale 4 bar and red mark at 2 bar) and safety valve are mounted on it. This valve is calibrated at a pressure of 2 bar and designed for a maximum discharge flow rate greater than 200 m<sup>3</sup>/h, the maximum limit to be complied with for the compressor that can be connected to the equipment.

### 3.3 POSSIBLE ELECTRICAL EQUIPMENT

The silo is designed for the installation of an electric vibrator (**to be used only in the absence of internal pressure**). This electric vibrator must be fixed to the special reinforcement (vibrator holder) located on the lower cone by means of the relative bolts, washers and self-locking nuts. The vibrator holder is set up with a double series of holes to be able to mount different models of vibrator. It is recommended to mount the following models (or of equivalent power)

**O.L.I. Mod. 200/3**

**ITALVIBRAS Mod. 300/3**

Models of higher power are to be avoided as they can cause serious damage to the cone and to the load-bearing structures of the silo. On request FIORE Impianti S.p.A. supplies the silo already complete with vibrator chosen from the suggested models and equipped with 4 meters of cable and standard sockets. In this case, the CE certificate of conformity for the vibrator installed is also attached to this booklet. This certificate must be kept together with the documentation.

## 4. GENERAL SAFETY RULES AND TRAINING

### 4.1 GENERAL SAFETY RULES

**Operators must necessarily follow the warnings and provisions listed below:** before starting their activities they must receive adequate training for activities concerning loading, handling, transport, installation and use of the silo; must wear the clothing and personal protective equipment prescribed for the activities carried out; must not remove or alter the plates and icons present; must implement all possible safety rules, precautions and instructions.

The following provisions are to be complied with:

- Do not pressurize the silo beyond what is permitted.
- Do not use materials other than those prescribed as they can damage the system and constitute a danger to the operator or the environment.
- Always ensure the stability and perfect verticality of the silo, especially after rain, storms, gusts of wind (water infiltration into the ground and reduced bearing capacity of the same).
- Periodically check (weekly and after each powder charge) the fastening of all the bolts tightening the flanges).
- Periodically check (weekly) all the hoses and the systems for *using* the limes that are connected to the silo.
- Position the silo only under the preparation conditions of the pitch and the achievement of the bearing characteristics described in this Manual.

## 4.2 STAFF EDUCATION AND TRAINING

The silo is suitable to be loaded, transported, installed and used by a single operator who has the necessary qualifications (refer in particular to the use and maintenance manual for handling and refilling means). The personnel assigned to operate the silo must possess the requirements indicated below, and also be aware of all the information relating to safety: general and technical culture at a sufficient level to understand the contents of the manual and to correctly interpret drawings, symbols, pictograms; knowledge of the main hygiene and accident prevention standards (correct use of the PPE protective devices identified); knowledge of the main building site regulations and responsibilities at various levels (bricklayer, site manager, safety plan project manager, construction manager, contractor, designer, tester, etc.). Furthermore, in addition to the aforementioned characteristics, maintenance technicians must have adequate technical preparation and experience above all in operating safely in non-standard or emergency conditions.

## 5. INTENDED USE OF THE SILO

The silo is designed for the storage of self-levelling screeds of plasters, glues, aggregates, binders, limes, chinks, premixed mortars, etc., with pressure operation. Transport can take place both with a partial load of 5000 kg (minimum load envisaged for installation for stability to wind action) in addition to the weight shown in the table in point 3.1, and with the load corresponding to the maximum capacity of the vehicles normally used for this type of silo, usually equal to 15,000 kg including its own weight. Transport carriers must be equipped with equipment for unloading and transporting premixed powder mortar silos. Furthermore, this carrier must be accompanied by a use and maintenance book with the necessary information for loading, unloading and transporting the silos and the operator must use it in advance before undertaking any activity.

**Warning: road transport of the pressurized vessel is prohibited!**

**Do not tamper with the maximum pressure valves of both the silo and the loading systems. The silo must not be used for purposes and loads greater than those described in the following point.**



SILO MODEL	MAXIMUM INSTALLATION LOAD (INCLUDING SILO WEIGHT) (kg)	MAXIMUM LOAD WITHSTANDABLE BY THE COUPLING SYSTEM (kg)
14D2000A30MT	19,000	15,000
18D2400A38PE	26,000	15,000
18D2400A38MT	26,000	26,000
20D2400A38PE	26,000	15,000
20D2400A38MM	26,000	15,000
20D2500A38MT	31,000	31,000
20D2500A38NB	31,000	4,000
22D2400A38PE	31,000	15,000
22D2400A38PEAD	31,000	15,000
22D2500A38MT	33,000	33,000

- The upper eyebolts and the front eyebolt can only be used for lifting and transferring the empty and free-swinging silos. The use of slings with a vertex angle of less than or equal to 60° is expected.
- The silo must be left on site with a minimum load of dust inside of approximately 5000 kg. The installation of the silo without the above minimum payload must take place with the preparation of the foundation as indicated in chapter 8 (points 8.1 and 8.2).

## 6. LOADING THE SILO

### 6.1 AT THE STARTING SITE (MANUFACTURER OF PREMIXED MORTARS AND PLASTERS)

The silo can be loaded directly at the manufacturer's site via the hatch located on the silo shell. Before proceeding with loading, it is necessary to **check the load capacity of the means of transport, of the lifting device installed and any limitations** imposed by the loading system, which are in any case lower than the limits set out above. After loading, carefully clean the sealing area of the manhole and the gasket to prevent the formation of incrustations with consequent lack of pressure seal. Close the lid by fully tightening the handles. For loading the silo, the personnel must also know the instructions given in the manual of the truck, the lifting device and the loading system. The silo is able to contain powdery solid materials such as plasters, premixed mortars, limes, cements as long as they have minimum humidity contents, in any case not higher than 0.05%. Otherwise, if it is not emptied within a short time, there is a risk of consolidation of the product inside the silo itself.

The permitted powders are: mortars for rough coats, plasters and screeds, gypsum plasters, concretes, traditional mortar (cement-lime), lime-based mortar, hydraulic, heat insulating, retarded, water repellent, resistant to salts lime, cement.

## 6.2 LOADING AT THE USE SITE

During loading operations, the silo must be electrically disconnected from the power supply. During loading operations on site, the loading and venting units are connected to the tank vehicle via hoses with interposed gaskets and blocked in position by special pins or by the tie rods themselves.

The operator must comply with all the instructions given in the tank vehicle use and maintenance manual. For these types of silos, always keep the vent tube and the relative dust suppression units free, as the container is not designed to withstand the overpressures exerted by the loading systems by blowing compressed air. The material loading hose must be connected to the loading unit, the powder recovery and filtration system to the vent unit. Pay the utmost attention not to reverse the connections. The silo located at the site of use must never be completely unloaded, but must be left with at least 50 kN (50 quintals) of material, equal to approximately the content of the lower cone, to guarantee sufficient stability against tipping over under the action of the horizontal thrust generated by the wind and in conditions of the silo simply resting on the ground without any anchorage (condition generally used on site). The level corresponding to 50 kN corresponds to the highest level of the cone that can be found by hitting the tank with a rubber hammer (the noise becomes less intense where there is powder). It is forbidden to use any heavy or pointed metal object which could damage the sheet metal, inducing possible concentrations of stress at the point of impact which could jeopardize its stability. It is advisable not to speed up loading operations beyond normal as this affects the tendency for the product to demix.

**The maximum permissible load results in an incomplete filling of the silo.**

## 7. TRANSPORT CONDITIONS

### 7.1 TRANSPORT CONDITIONS OF THE SILO WITH A STABILIZATION LOAD OF 50 QUINTALS

**Before any transport, the installation site must be prepared as described further on. The operator must comply with all the instructions given in the use and maintenance manual of the silo loading vehicle (in particular, lower the rear stabilizers before lifting).** The operator must act alone (necessarily being in the position of the control levers of the hydraulic power system) **and must make sure that there are no other people in the work area.** Suspend all operations if somebody is present within a 10 m radius and ask for him/her to move away. Also make sure not to hit any high voltage or overhead power line cables.

#### 7.1.1 LIFTING

The carrier must present the suitable equipment for the coupling with the silo lifting attachment, with a tipping structure and a device for winching and holding the silo horizontal on board the vehicle. Furthermore, the cylindrical shell of the silo, once overturned, must rest along its entire length on the shaped supports so as to allow the maintenance of its cylindrical shape as well as its retention when cornering (centrifugal force). **It is essential that the coupling takes place up to the end of the stroke, but there must always be play between the coupling device and the pockets.** Lift slowly (stop about 30 cm from the ground) paying attention to the centring of the pocket by the hooking device and the saddle resting on the UNP profiles.

### 7.1.2 TIPPING OVER AND FIXING ON BOARD CARRIER

Carry out the overturning slowly observing the perfect housing of the cylindrical shell inside the shape of the support structure; once overturned (supported by the side members), winch the silo up to the end stop.

### 7.1.3 TRANSPORT

During transport, the operator must comply with all traffic regulations; **avoid abrupt braking or accelerating and in particular pay the utmost attention when cornering since the transport of loose powders with partial filling, due to the centrifugal effect, can cause the instability of the vehicle on the bends (tipping over).**

### 7.1.4 HOUSING OF THE SILO IN THE WAREHOUSE OR ON THE SITE

Carry out the above operations in reverse order, in particular pay attention **during the lowering phase that at least two uprights touch the ground at the same time**. The ideal unloading is to swing (rotate) the load-bearing structure so that the silo rests almost simultaneously on both of the tubular support profiles with a rectangular section. In case of support in correspondence with a single upright, suspend the lowering before touching the ground and acting on the stabilizers, try to reach the contact and support conditions described above.

**DANGER: Contact and support on a single upright can cause permanent deformation of this upright as it is excessively loaded until the load is distributed over the entire supporting trestle.**

**It is forbidden to interpose shims (wooden planks, wooden murals, steel profiles or natural stones) in order to reach contact at least at two uprights or in order to achieve a perfect vertical position of the silo.** This serious "failure" leads to a dangerous concentration of weights on a restricted area of the supporting rectangular section profiles and an increase in pressure on the ground of the housing pitch. Even if at the moment the subsidence of the same may not occur, over time and with different environmental conditions (rain, water infiltration into the ground, dynamic action of the wind, etc.) the subsidence and lowering of the ground, as well as the tipping over of the silo could occur. Always check that the tubular profiles of the silo feet are always supported for their entire extension in order to obtain as much as possible a homogeneous pressure on the support ground, as estimated (see point 8.1).

## 8. SITE INSTALLATION CONDITIONS

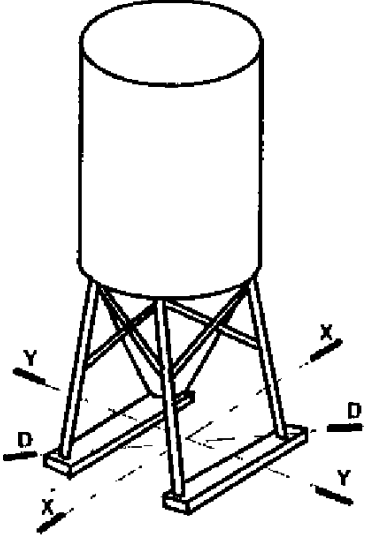
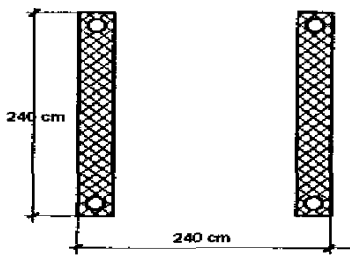
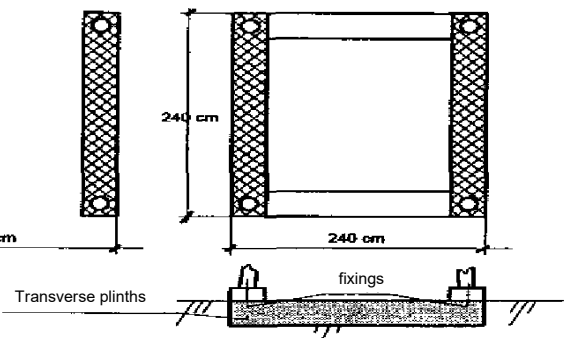
### 8.1 PITCH PREPARATION (FOUNDATIONS AND SUPPORT BASES)

The product has two support bases in rectangular steel profile each with a support footprint of 240×30 cm. The use of the silo must take particular care in choosing the site and in preparing the suitable pitch for installation, with specific reference to the carrying capacity of the soil and its levelling. In particular, it should be noted that the pressure levels induced by the superstructure through the support bases of the silo on the ground can reach values of a certain consistency in the most onerous conditions, as can be seen from the table below (according to calculation table) and in the three directions of the possibility of dynamic loads (wind and seism).

**The table must be consulted by the Site Works Manager; the operators will act on the basis of the indications provided by the Project Manager.** An examination of the table shows that with a fully loaded silo and in the presence of wind, the induced pressures can reach values between 2.00 - 3.00 daN/cm<sup>2</sup>, values that require soils with good load-bearing and geodetic characteristics. In the presence of poor soil from a geological point of view, characterized by poor bearing capacity, it will be necessary to integrate the support bases as in fig. 2, using prismatic plinths of adequate mechanical characteristics and sinking into the ground for their entire thickness. These plinths must have the following minimum dimensional characteristics: 240×30×30 cm and will preferably be made of reinforced concrete with resistance class Rck > 250; the minimum reinforcement must include four bars with a diameter of  $\varnothing = 16$  mm, quality FeB44K, with improved adherence, arranged longitudinally at the corners of the prism, with brackets with a diameter of  $\varnothing = 8$  mm of similar quality, arranged at a distance of 15 cm. Alternatively, rectangular profiles of the same size as those of the silo bases, or timber beams, section 30×30 cm specially treated and impregnated, can be used. In relation to the above and the pressure table on the ground, it will be the responsibility of the site manager, based on the characteristics of the ground, to evaluate the opportunity to integrate the silo's own support bases.

If the silo is installed unloaded (without the minimum wind stabilization load of 50 kN), the foundations must be secured with the concrete plinths necessarily prepared and of such dimensions that their weight is at least equal to 50 kN (quintals) or through fixed anchors in the ground of equal strength.

## GROUND PRESSURE TABLE

				
	<p>1) Only the silo's own support bases (Fig. 1)</p> <p>2) Support bases typical of the silo + transversal rectangular plinths (Fig. 2)</p> <p>3) Hypothesis of Winkler foundation on soil</p> <p><b>P</b> = silo own weight  <b>Q</b> = powder payload  <b>V</b> = wind load (dynamic)  <b>S</b> = seismic load (dynamic)</p>			
type of support bases	P+Q	direction X - X P+Q+V (daN/cm <sup>2</sup> )	direction X - X P+Q+S (daN/cm <sup>2</sup> )	direction D - D P+Q+S (daN/cm <sup>2</sup> )
1)	1.8	2.37	3.34	3.36
2)	1.03	1.39	1.59	1.88
3)	2.51	**	3.72	3.94

## 8.2 REQUIREMENT FOR INSTALLATION ON SITE

The installation of the silo, by the operator, must also comply with the current regulations regarding the following (as indicated by the Site Safety Manager and/or the Works Supervisor): distance from the power supply lines; connection to the earthing system; distance from the excavations relative to the foundations of the building structure or from any associated systems.

## 9. TERMS OF USE

### 9.1 USE OF PERSONAL PROTECTIVE EQUIPMENT

While using the silo, the operator must wear the **mandatory PPE** supplied, which are: gloves, safety shoes (with anti-puncture nail soles), overalls or equivalent (UNI), helmet. The **non-mandatory PPE**, but to be worn in case dust is produced with the risk of inhalation and high-intensity noise is produced with the risk of hypoacusia (deafness), these are mask and ear plugs.

### 9.2 CONNECTIONS AND PRELIMINARY CHECKS

Install the powder mixing system with relative electrical connection as per the regulations (point 0.1) and follow the provisions of the relative user manual. The use of adapters, multiple sockets and/or extension cords not approved for outdoor use and of the type suitable to avoid the danger of infiltration of water and powder (IP 55) is prohibited. Connect the water supply system to the mixing group and open the supply tap.

Before using the silo, check: the correct connection of the earthing system and its effectiveness, the integrity of the electrical panel, control panel, electrical cables; that there are no water leaks; the closure and tightness of all gaskets; that the silo has not been damaged during installation and that its verticality is maintained over time (in particular after atmospheric events and water infiltration into the ground). If the minimum powder level is reached, ask for the silo to be filled or replaced with a full one.

### 9.3 START-UP AND USE OF THE SYSTEM

For the equipment supplied with the silo (pumps, mixers, etc.), follow the instructions in the use and maintenance manuals of the same. Connect the compressed air delivery pipe to the quick-fit coupling, open the 1" ball valve and pressurize the silo. To let the material out, fully open the 2 ½" ball valve by acting on the 19×19 square with the appropriate key. Do not use the valve with openings restricted as this causes rapid wear of the same. When finished, close both the 2 ½" material shut-off valve and the 1" ball valve, disconnect the compressor and compressed air line, then open the ball valve slightly to slowly release the internal pressure. At the end of use as well as during any filling of the silo, disconnect the power supply. Proceed to clean and wash any parts that may have come into contact with the leaked product to avoid the formation of incrustations.

## 10. MAINTENANCE

### 10.1 ANOMALIES AND INTERVENTIONS

In the event of a powder leak, disconnect the power supply, wear respiratory protection PPE (mask) and check the reason for the leak; before opening the bolts of the hose connection flanges, make sure that there is no dispersion into the environment or empty the silo. In case of **damage to the metal structure of the silo**, wear PPE hearing protection (ear plugs) especially when using hammers or manual tools. For any doubts about the anomalies found, contact the Manufacturer's Maintenance Service.

#### **DANGER:**

- **Local heating or welding must not be carried out, in particular on the support trestle of the silo before it is completely emptied** (the characteristics of mechanical resistance decrease with the possible yielding and overturning of the structure).
- In case of inspection, cleaning or repairs inside the silo with the use of the manhole, in addition to the necessary PPE, a harness with a safety rope must be worn belonging to a second external operator for surveillance and assistance to the one inside the silo.

Before inspection, the tank must be brought to a horizontal position, preferably with the manhole facing the side in order to facilitate recovery in the event that the operator were taken ill inside the silo itself. Access only to an empty silo and **not under pressure** (make sure that the pressure gauge indicates "zero"), after opening the manhole and removing the valve on the cone to install an aspirator and guarantee ventilation or with the use of self-contained breathing apparatus and an operator trained in case of interventions involving the use of equipment or tools that give off fumes or harmful powders (disc wheels and welding machines). It is good practice to periodically grease the pins and bolts using normal grease. The **washing of the silo** can be done with high pressure hydropumps or with normal means, always with the silo **electrically disconnected, carefully avoiding water infiltrations** inside the same (with subsequent filling, incrustations and waste are formed which could compromise the system efficiency). Storage of the silo during long periods of non-use must be done indoors if possible or in any case avoiding places with high humidity, aggressive atmospheres, stagnant snow, etc. as they damage the protective varnish in the long run.

### 10.2 CHECKING FOR DAMAGES

After each return of the silo to the site, check: wear of the threads and gaskets; the absence of dents on the cylindrical body or on the cone of the silo; the **absence of dents on the load-bearing elements** and on the tubular elements of the trellis bracing (the deviation from the linearity of the axis following impacts can cause the collapse of the upright stressed at peak load with consequent tipping over of the silo); the weld seams of the shell, of the load-bearing trestle, of the pockets and of the lifting eyebolts, in particular

check underneath for any cracks in the covering paint (every month). For periodic operational checks, consult the relevant national legislation; for Italy, refer to Ministerial Decree 329 of 1 December 2004. **It should be remembered that if the frequency of checks and verifications indicated by the manufacturer of the safety devices is lower than the legislative requirements, it is necessary to comply with these provisions.**

## 11. REQUEST FOR SERVICE OR SPARE PARTS

The manufacturer **FIORE Impianti S.p.A.** is available for any type of information relating to use, maintenance, installation, etc., as well as to requests for original spare parts. The Customer should ask questions in clear terms, with references to this Manual and specifying the identification data of the machine shown on the plate (in point 1.1). In particular, state: buyer's details, silo model, factory No., year of construction. FIORE IMPIANTI S.p.A. provides assistance for the supply of original spare parts and components.

The request must be forwarded to:

**FIORE Impianti S.p.A.**  
Via G. Pascoli, 1/C  
36065 MUSSOLENTE (VI)  
Tel. 0424 578711 - Fax 0424 577552  
E-Mail: [info@fioreimpianti.it](mailto:info@fioreimpianti.it)

**WARNING: The Customer must purchase and use original spare parts.**

**The same goes for the accessories, especially for the safety valve which must comply with directive 97/23/CE and have technical and functional characteristics similar to those indicated in the test certificate.**

Parts replacement operations must be entrusted to qualified maintenance personnel and carried out following the safety procedures listed in the MAINTENANCE chapter.

**Repairs to the body of the silo must only be carried out by the manufacturer or by authorized companies.**



**APPENDIX. SAFETY DEVICE**

The equipment receives air from an electric compressor with a flow rate of 200 m<sup>3</sup>/h.

**Do not use compressors with capacities higher than those indicated.**

The safety group includes the following devices:

- Pressure gauge with 4 bar full scale and red mark at 2 bar
- CE certified 3/4" PN40 safety valve with the following characteristics:

Flow rate = 4000 l/min = 240 m<sup>3</sup>/h > 200 m<sup>3</sup>/h

Calibration pressure = 2.0 bar

The calibration report at the manufacturer's premises and the declaration of conformity are provided in the annex.



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