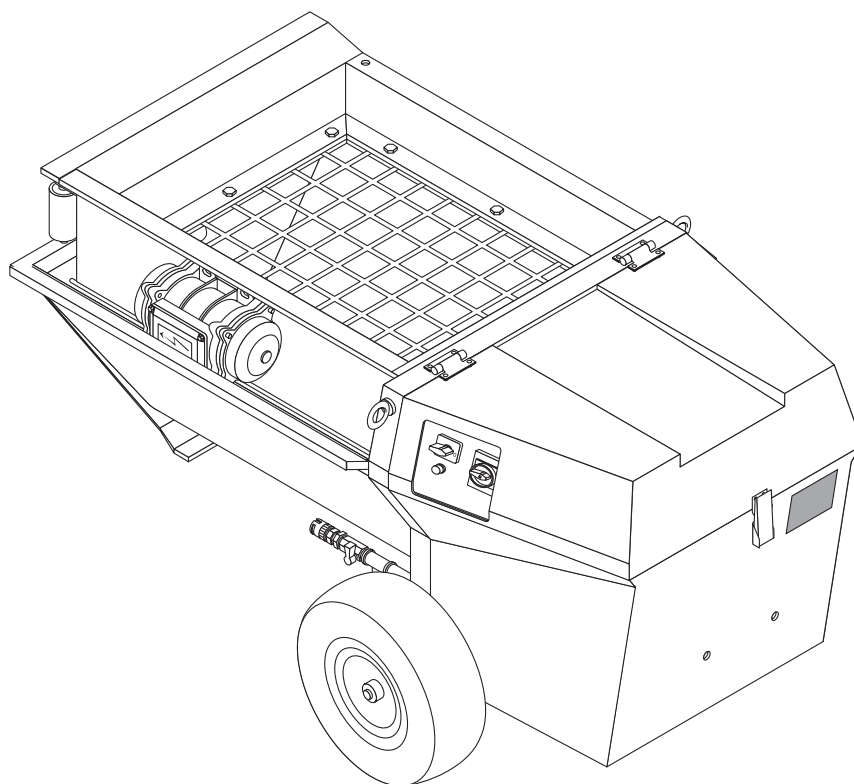




# MINI AVANT

IS11/12 - 561185



Serial number

						/		
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**READ THIS MANUAL CAREFULLY BEFORE USING THE MACHINE.  
THIS MANUAL IS AN INTEGRAL PART OF THE MACHINE AND MUST BE KEPT FOR FUTURE REFERENCE  
UNTIL THE MACHINE IS DISPOSED OF**



# TURBOSOL

TECNOLOGIA DI POMPAGGIO PER L'EDILIZIA



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## 1.1 CE DECLARATION OF CONFORMITY

Dichiarazione CE di conformità - *EC declaration of Conformity* - EG - Konformitätserklärung -  
 Déclaration CE de conformité - Declaración de Conformidad CE - Declaração CE de conformidade

Il fabbricante - *The manufacturer* - Le fabricant - *Der Hersteller* - El fabricante - *O fabricante*

**TURBOSOL**  
**PRODUZIONE S.p.A.**  
 Via A. Volta, 1  
 31030 Pero di Breda  
 TREVISO - ITALIA

---

dichiara che la seguente macchina:  
*declares that the machinery:*  
*déclare que la machine:*  
*erklärt, dass die Maschine:*  
 declara que la máquina:  
*declara que a máquina:*

---

Intonacatrice  
*Plaster sprayer*  
 Machine à projeter les enduits  
*Putzmaschine*  
 Enlucidora  
*Rebocadora*

---

Modello - *Model* - Modèle - *Modell* - Modelo - *Modelo*      **MODELLO**  
 Versione - *Version* - Version - *Version* - Versión - *Versão*      **VERSIONE**  
 Maticola numero - *Serial number* - Numéro de matricule -  
*Seriennummer* - Número de matrícula - *Número de matrícula*      **XXX.XXX**  
 Anno di fabbricazione - *Year of manufacture* - Année de fabrication -  
*Herstellungsjahr* - Año de fabricación - *Año de fabrico*      **ANNO**

---

è conforme alle disposizioni della direttiva 98/37/CE e alle disposizioni nazionali di attuazione;  
 è anche conforme alle disposizioni delle seguenti direttive europee: 2000/14/CE, 2006/95/CE, 2004/108/CE;  
 è conforme alle disposizioni delle seguenti norme armonizzate: EN 12100-1/2:2005, EN 294:1993, EN 60204:2006.


*fulfils all the relevant provisions of the Directive 98/37/EC;*  
*also fulfils all the relevant provisions of the following European Directives: 2000/14/EC, 2006/95/EC, 2004/108/EC;*  
*fulfils the provisions of the following harmonised standards: EN 12100-1/2:2005, EN 294:1993, EN 60204:2006.*

est conforme aux dispositions de la directive 98/37/CE;  
 est également conforme aux dispositions des directives européennes suivantes: 2000/14/CE, 2006/95/CE, 2004/108/CE;  
 est conforme aux dispositions des normes harmonisées suivantes: EN 12100-1/2:2005, EN 294:1993, EN 60204:2006.

*den Bestimmungen der Richtlinie 98/37/EG;*  
*ebenso den Bestimmungen der folgenden europäischen Richtlinien entspricht 2000/14/EG, 2006/95/EG, 2004/108/EG;*  
*den Bestimmungen der folgenden harmonisierten Normen entspricht: EN 12100-1/2:2005, EN 294:1993,*  
*EN 60204:2006.*

es conforme a las disposiciones de la directiva 98/37/CE;  
 también es conforme a las disposiciones de las siguientes directivas europeas: 2000/14/CE, 2006/95/CE, 2004/108/CE;  
 es conforme a las disposiciones de las siguientes normativas armonizadas: EN 12100-1/2:2005, EN 294:1993,  
 EN 60204:2006.

*é conforme às disposições da directiva 98/37/CE;*  
*também é conforme às disposições das seguintes directivas europeias: 2000/14/CE, 2006/95/CE, 2004/108/CE;*  
*é conforme às disposições das seguintes normas harmonizadas: EN 12100-1/2:2005, EN 294:1993, EN 60204:2006.*





**An original copy of the CE Declaration of Conformity is supplied separately from the manual.**

## 2.1 IMPORTANCE OF THE MANUAL

This "Use and Maintenance Manual" has been drawn up following the guidelines envisioned in the relevant European Directives in order to guarantee simple and full understanding of the subjects by the operators authorised to operate and perform maintenance on the machine in question. The manufacturer has prepared this manual with the greatest care. However, should any operators find any part of the manual difficult to understand, they should contact the manufacturer immediately and request explanations and/or further information in order to avoid misunderstandings that might compromise the user's safety. Before using the machine, authorised operators must read and understand this "Use and Maintenance Manual" in every part and strictly follow the Standards herein, in order to ensure their own safety and that of others, to make the machine work at its full potential and to ensure a long-lasting and efficient service life to all the machine parts. This manual should be safely stored and kept close to the machine at all times for immediate consultation by operators.

Only specifically trained and authorised staff can operate and perform maintenance on the machine.

Operators must follow all the instructions regarding the prevention of accidents and the regulations on workplace safety in force in the country of use.

The Manufacturer shall not be responsible for any damages resulting from changes made arbitrarily to the machine.

Users are advised to take note of the machine's serial number; it must be presented along with every request for technical assistance or for spare parts, and will facilitate processing such requests.

This manual reflects the latest information available at the time of marketing the appliance and should not be considered inadequate only because it may be successively updated on the basis of newly acquired information.

Reprinting or reproducing this manual, in whole or in part, is not allowed unless authorized by ourselves in writing.

THE MANUFACTURER DECLINES ANY RESPONSIBILITY FOR DAMAGES TO PERSONS, ANIMALS OR PROPERTY CAUSED BY FAILURE TO OBSERVE THE STANDARDS AND RECOMMENDATIONS CONTAINED HEREIN.

## 2.2 ABBREVIATIONS

<b>ca.</b>	around	<b>min</b>	minutes
<b>cap.</b>	chapter	<b>N.</b>	number
<b>DPI</b>	device of individual protection	<b>pag.</b>	page
<b>DX</b>	right	<b>par.</b>	paragraph
<b>h</b>	times	<b>pos.</b>	position
<b>EN</b>	European Norm	<b>RIF.</b>	reference
<b>Es.</b>	example	<b>s</b>	second
<b>FIG.</b>	figure	<b>SX</b>	left
<b>max.</b>	maximum	<b>TAB.</b>	table
<b>min.</b>	minimum	<b>v.</b>	see

TAB.01

## 2.3 INFORMATION FOR CONSULTING THE MANUAL

**Boldface:**

Highlights important parts in the text.

## 2.4 DESCRIPTION OF THE SYMBOLS

Information and recommendations that are particularly important are indicated in this manual by the following symbols:



**ATTENTION:** *this symbol indicates safety regulations regarding the operator.*



**PRECAUTION:** *this symbol indicates the possibility of causing damage to the machine and/or its parts.*



**DANGER:** *this symbol indicates the presence of electrical energy.*



**IMPORTANT NOTE:** *this symbol supplies useful information.*

## 2.5 MACHINE OFF

Before performing any type of maintenance and/or regulation on the machine, it is mandatory to isolate the electric power supply. Disconnect the electric cable, make sure that the machine is effectively off, discharge the pressure in the mortar pipe taking the by-pass lever (FIG.27-REF.4) to the vertical position and also make sure that the line manometer indicates zero bar.

## 2.6 GENERAL AND CONTACT INFORMATION

The MINI AVANT electric plastering machine and conveyor of common and special mortars can be supplied in different set-ups and with different accessories, therefore it is not said that all components described in this manual are mounted on your machine.

The Customer Service department of Turbosol Produzione S.p.A. will be glad to provide any information you may need.



### **Turbosol Produzione S.p.A.**

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e-mail: [info@turbosol.it](mailto:info@turbosol.it)

### **TURBOSOL MACHINES**

They are the result of years of experience and constant research. The "know how" acquired in this way, along with great attention to quality, constitutes the fundamental guarantee for the manufacturing of machines with long duration, great reliability and reduced management costs.

### **MAINTENANCE AND CARE**

Proper maintenance and care are essential for the machine to work as designed. It is therefore extremely important that users respect the recommended maintenance intervals and carry out any maintenance required, both to keep the machine in perfect running order and to preserve the validity of the warranty.

### **SAFETY**

All service staff must be informed of the Safety Standards. The general Standards relative to safety and accident prevention envisioned by local legislation must also be complied with.

### **OPERATOR TRAINING**

The operator must receive specific training regarding the operations to be carried out. Turbosol periodically carries out training courses, also on specific request of the customer.

### **TURBOSOL SERVICE**

**Please contact your TURBOSOL dealer for any information regarding machine malfunctions or requests for spare parts.**

Turbosol Produzione S.p.A. reserves the right to make any technical modification for machine improvement, even if not contemplated in this manual. Some drawings and representations may be indicative.



### 3.1 NAME OF MACHINE

#### CE mark plate

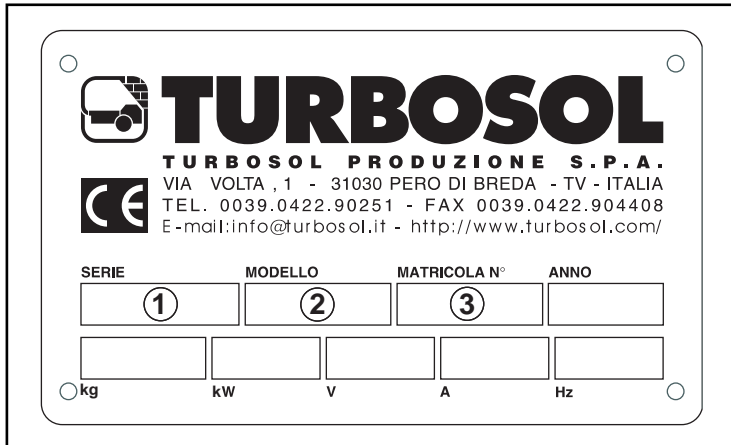


FIG.01

The CE mark appears on a 159x95 mm plate (FIG. 01) that is partially screen-printed and partially engraved. The machine's series (1), model (2) and serial number (3) are engraved on the nameplate, as well as its power rating. The meaning of the symbols used are as follows.

- (1) = Machine series.
- (2) = Machine model.
- (3) = Machine serial number.

#### Position of the CE mark plate

The CE mark plate (FIG. 02-REF. 1) is affixed to the machine's bodywork.

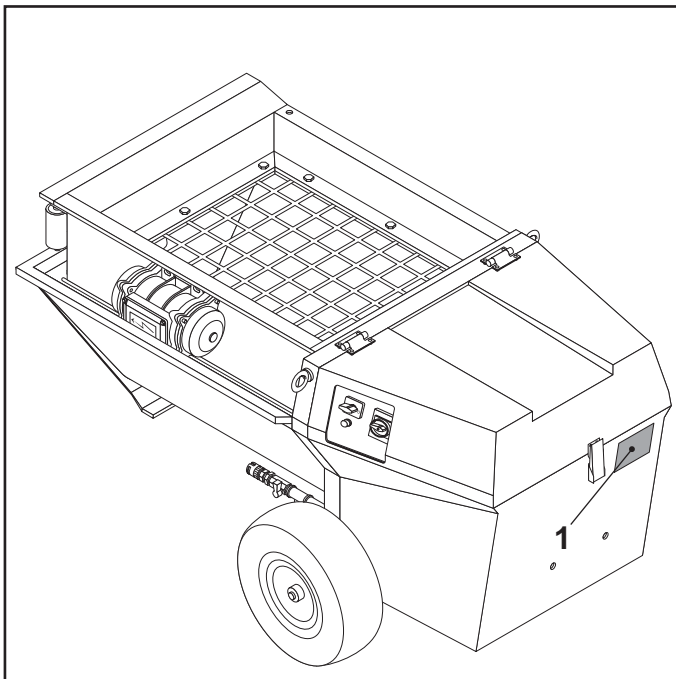


FIG.02

#### Position of the machine serial number

The machine's serial number (FIG. 03-REF. 1) is punched onto the frame as well as on the nameplate.

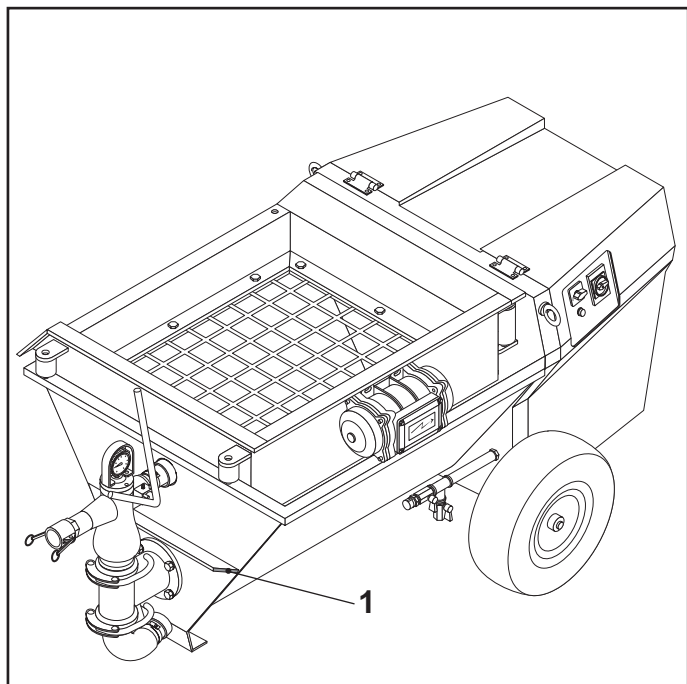


FIG.03

### 3.2 DIMENSIONS OF MACHINE

The following are the machine's overall dimensions and gross weight (in working conditions).

VERSION	LENGTH	WIDTH	HEIGHT	WEIGHT
<b>Single-phase</b>	1590 mm	860 mm	750 mm	240 kg
<b>Three-phase</b>	1590 mm	860 mm	750 mm	240 kg
<b>Vario</b>	1590 mm	860 mm	750 mm	240 kg

TAB.02

### 3.3 TECHNICAL DATA

Power supply voltage	E (three-phase) E (single-phase) VARIO	<b>V</b>	400 200÷230 230
Command circuit power supply		<b>V</b>	24 AC
Input power		<b>kW</b>	2.2
Short circuit current		<b>kA</b>	6
Calibration pressure	pumping stop pneumatic control pumping re-start pneumatic control	<b>bar</b>	4 2
Flow rate	E (three-phase) E (single-phase) VARIO	<b>l/h</b>	1450 ÷1800 1450 ÷1800 120 ÷1800
Maximum particle size that can be elaborated		<b>mm</b>	6
Maximum useful distance*		<b>m</b>	50
Maximum useful height*		<b>m</b>	15
Hopper capacity		<b>l</b>	140
Acceptable environmental temperature		<b>°C</b>	-5° ÷ 40°
Guaranteed sound power level LwA	E (three-phase) E (single-phase) VARIO	<b>dB</b>	96 94 96

#### **Electric motor**

Power supply voltage	E (three-phase) E (single-phase) VARIO	<b>V</b>	400 200÷230 400
Power supply frequency	E (three-phase) E (single-phase) VARIO	<b>Hz</b>	50 50 up to 70
Power		<b>kW</b>	2.2

#### **Compressor**

Power supply	-	belt transmission
Maximum input power	<b>kW</b>	1.5
Flow rate	<b>l/min</b>	247
Maximum pressure	<b>bar</b>	7
Compressor oil	-	SAE 15W40

#### **TAB.03**

\* maximum distance and height cannot be reached at the same time.

\*\* The operator must use Individual Protection Devices (IPD) for hearing.

### 3.4 INTENDED USES

The machine has been designed and built for the following use:

FIELD OF USE: construction sector.

DECLARED USE: conveying and spraying plasters.

### 3.5 PRODUCTS USED FOR WORKING

MINI AVANT elaborates ready-mixed products such as:

- Cement mortars - Ready-mixed with cement base (WITH DEDICATED KIT ONLY).

### 3.6 NAME OF THE COMPONENTS

FIG.04 and FIG. 05 show and names the main components that make up the machine.

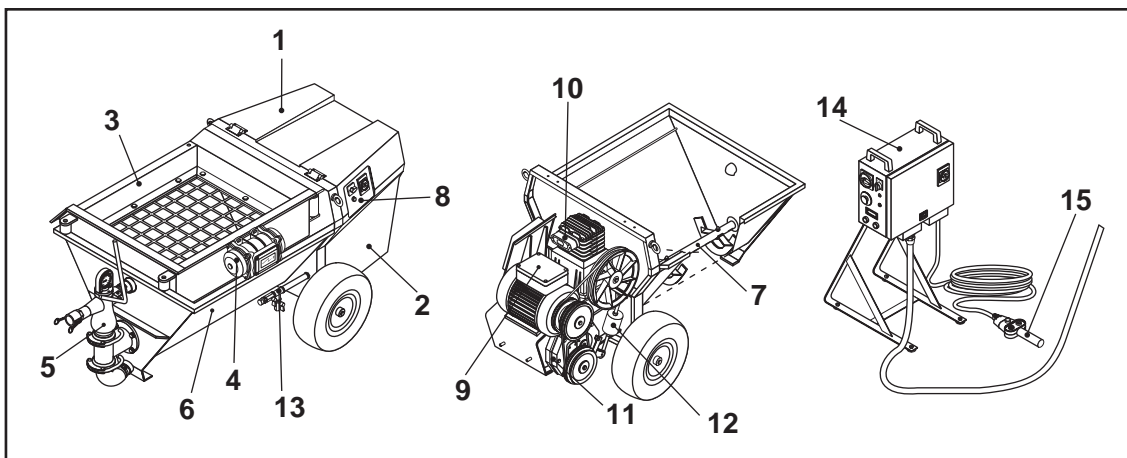


FIG.04

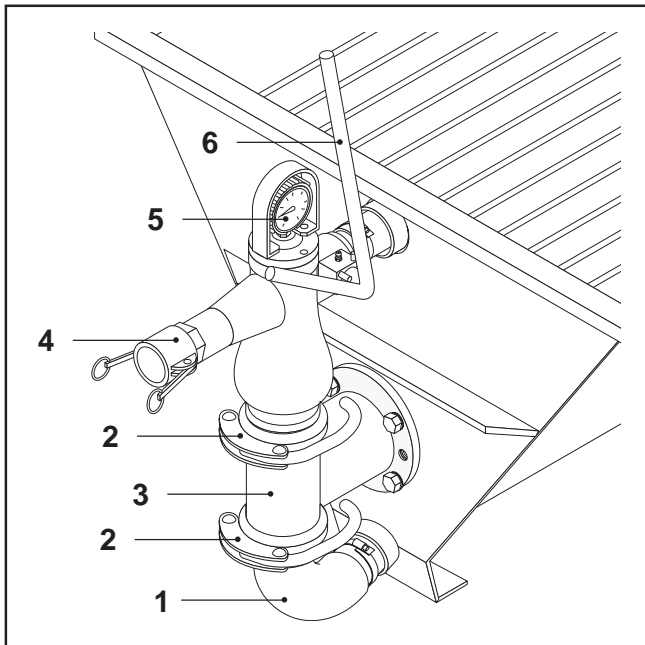


FIG.05

#### KEY:

FIG. 04-REF. 1 - Hood

FIG. 04-REF. 2 - Bodywork

FIG.04-REF.3 - Vibrating frame  
FIG. 04-REF. 4 - Vibrator  
FIG.04-REF.5 - Piston pump  
FIG. 04-REF. 6 - Hopper  
FIG. 04-REF. 7 - Mixing device  
FIG. 04-REF. 8 - Electric control board  
FIG. 04-REF. 9 - Engine  
FIG. 04-REF. 10 - Compressor  
FIG. 04-REF. 11 - Reducer  
FIG. 04-REF. 12 - Tensioner  
FIG.04-REF.13 - Connection for pneumatic controls  
FIG.04-REF.14 - Electric control board with inverter (MINI AVANT VARIO ONLY)  
FIG.04-REF.15 - Electric Remote control board (MINI AVANT VARIO ONLY)

FIG.05-REF.1 - Intake collector  
FIG.05-REF.2 - Quick connection  
FIG.05-REF.3 - Intake valve body  
FIG.05-REF.4 - Flow valve body  
FIG.05-REF.5 - Line manometer  
FIG.05-REF.6 - By-pass lever

#### Supplied as per standard

- 30 metres (10+20) or mortar piping [dia] 35 mm with cam fittings.
- 33 metres of air piping [dia] 8 mm with bayonet fittings.
- Tool box with gun and series of deflectors.
- CE Declaration of Conformity
- Use and maintenance manual with spare parts catalogue.

#### Accessories on request

- Piping extensions.
- Various types of gun.
- Ready-mixed and light isolating plaster pumping kit.
- Kit for injection of cement slurries.

#### 4.1 TRANSPORT

MINI AVANT has two wheels for normal movement inside the work area.

MINI AVANT cannot be towed on roads.

MINI AVANT can also be carried on motor vehicles; loading, securing and transporting the machine on a motor vehicle should always be done in compliance with the rules of the road. See paragraph 4.2, LIFTING, for information on using lifting apparatus to load MINI AVANT on a vehicle.

#### 4.2 LIFTING

Lift the machine using the hooks positioned at the sides of the machine (FIG.05).

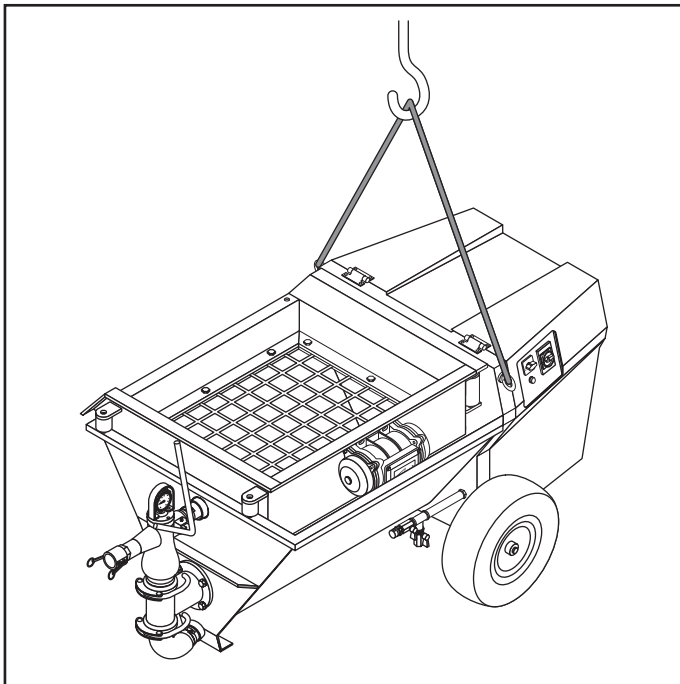


FIG.06



**Use ropes, slings and hooks that are type-approved for a minimum weight of 500 kg.**

MINI AVANT must be lifted in safe conditions. Lifting and transport means and equipment must be appropriate, regarding safety, the nature, the form and the volume of the loads that must be lifted and transported. This equipment must also be used in compliance with Standards regarding the operation of lifting equipment.

## 5.1 POSITIONING THE MACHINE

Place the machine in a horizontal position; the maximum gradient allowed is 5° both lengthwise and crosswise (FIG.06).

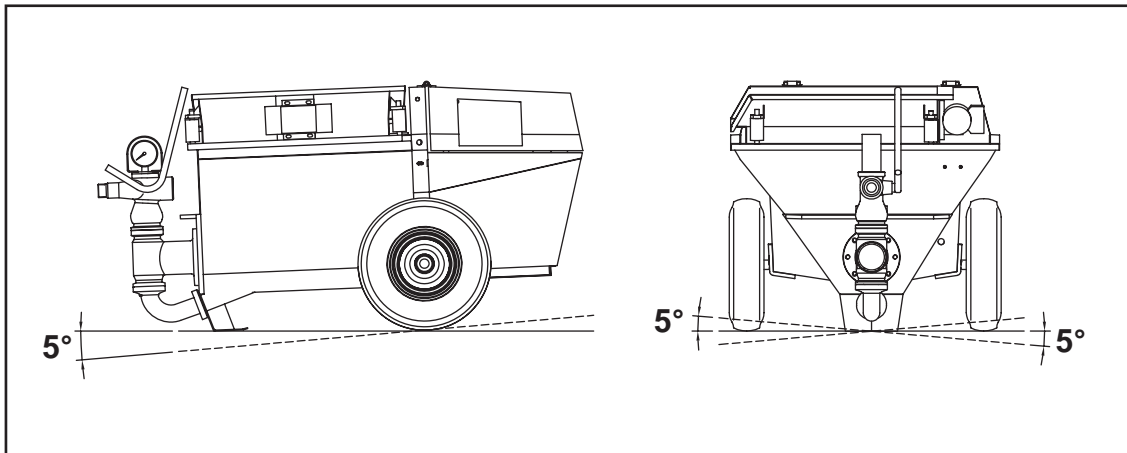


FIG.07

The machine must be positioned in the point of the worksite that allows the pipes and hoses to their full extension.



**Be sure to leave a passageway all around the machine (FIG.08) clear of any obstacles and with no holes or hazardous projections.**

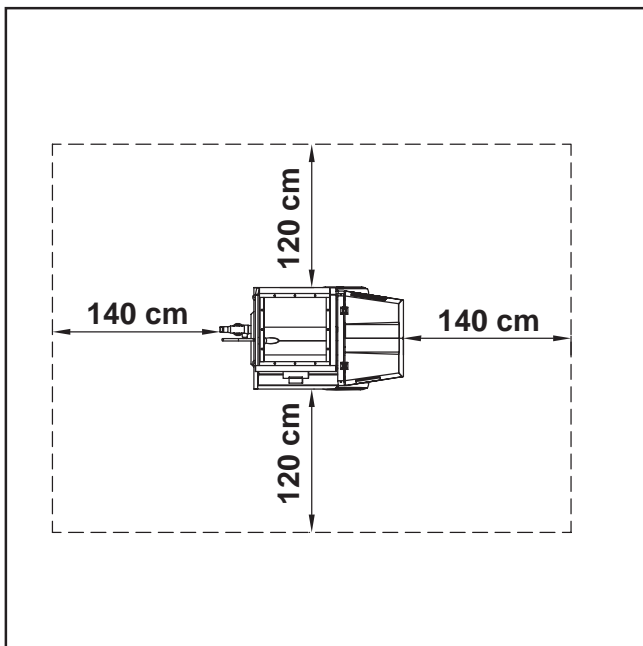


FIG.08

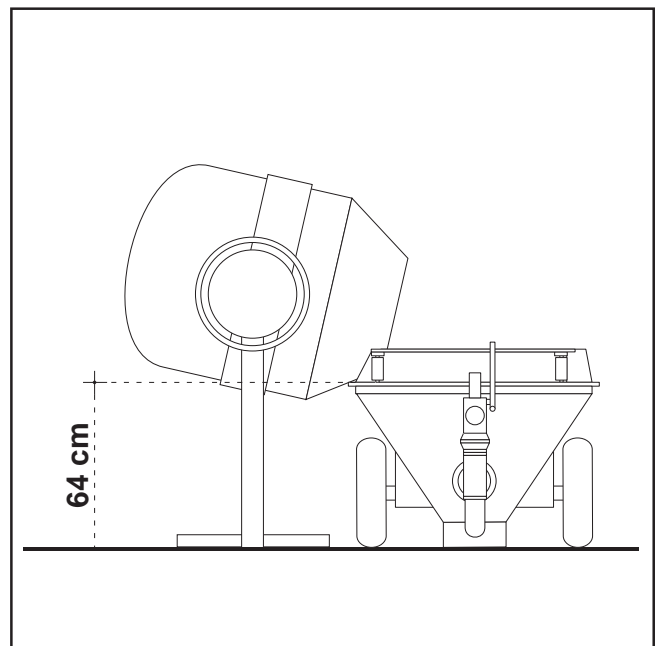


FIG.09

The hopper loading height is about 64 centimetres (FIG.09).

## 5.2 PIPING

Lay out the piping optimising lengths as much as possible (to reduce transport time and wear) and make sure the pipes are in good condition.

The pipes must be connected to each other with the longest pieces (20 mt) connected to the machine and so on until the shortest pieces are connected to the gun.



**Use only original pipes and fittings. The pipes must be fitted by TURBOSOL PRODUZIONE S.p.A. or by companies expressly authorised by TURBOSOL.**

**In no case is TURBOSOL PRODUZIONE S.p.A. responsible for damage/injury to objects/persons caused by using non-original piping or fittings.**



**Always use the complete supply of piping (20+10 metres) even if longer than the minimum necessary. Shorter pipes cause irregular spraying.**



**Only use piping specific for MINI AVANT, supplied by TURBOSOL PRODUZIONE S.p.A. Pipes of a different nature and origin cause irregular functioning of the machine.**

### 5.2.1 Piping anchorage

The pipe line must be fixed appropriately: use the pipe clamps (FIG.10-REF.1) for fixing the vertical tracts (it must always be positioned under the joint) and the appropriate arrival pipe clamp (FIG.10-REF.2).

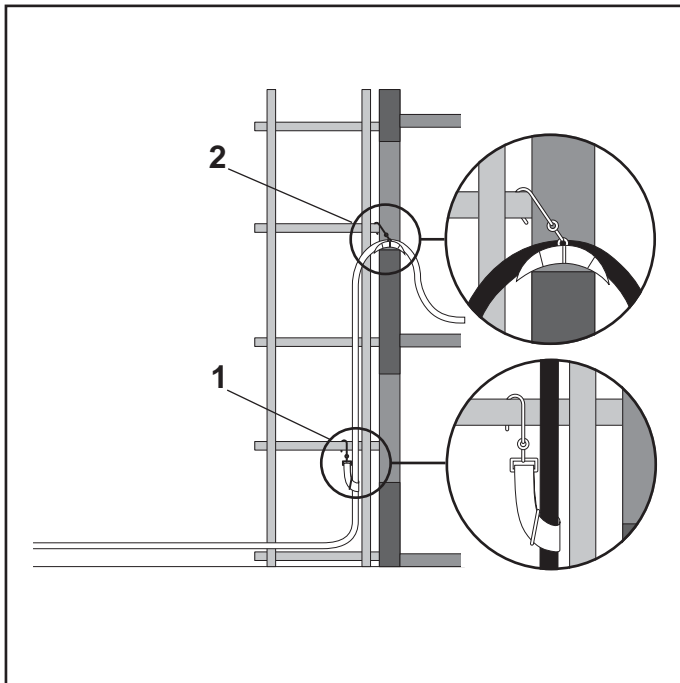


FIG.10



### 5.3 FITTINGS



*Make sure the fittings are clean and in good order at all times.*

#### Cam fittings

- Connect the pipe segments, checking that the rubber gasket is present (FIG.10-REF.1).
- Tighten the levers completely (FIG.10-REF.2).

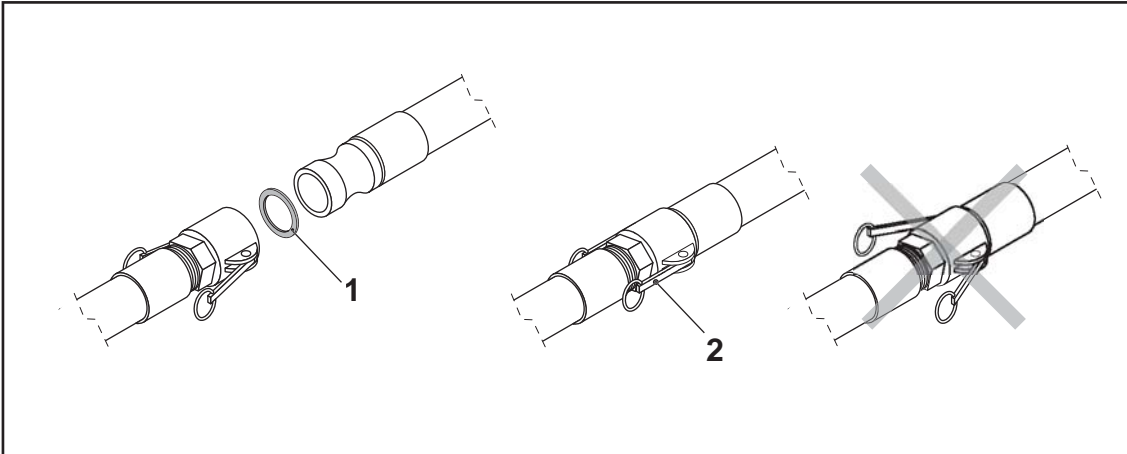


FIG.11

## 5.4 CONNECTIONS

### 5.4.1 Electric connection



**Before connecting MINI AVANT to the site control board, check that it complies with the Directives and Standards in force regarding safety.**

The site electric control board must respect the Standards in force and have:

- sufficient power to feed the machine,
- suitable earthing,
- suitable protection fuses,
- high sensitivity differential switch.

- Connect MINI AVANT to the site electric control board using an electric cable covered with neoprene, marked H07RN-F.

- Insert the electric vibrator plug into the corresponding socket positioned on the electric control board:  
(FIG.11-REF.1) for MINI AVANT AND THREE-PHASE or SINGLE-PHASE  
(FIG.11-REF.2) FOR MINI AVANT VARIO

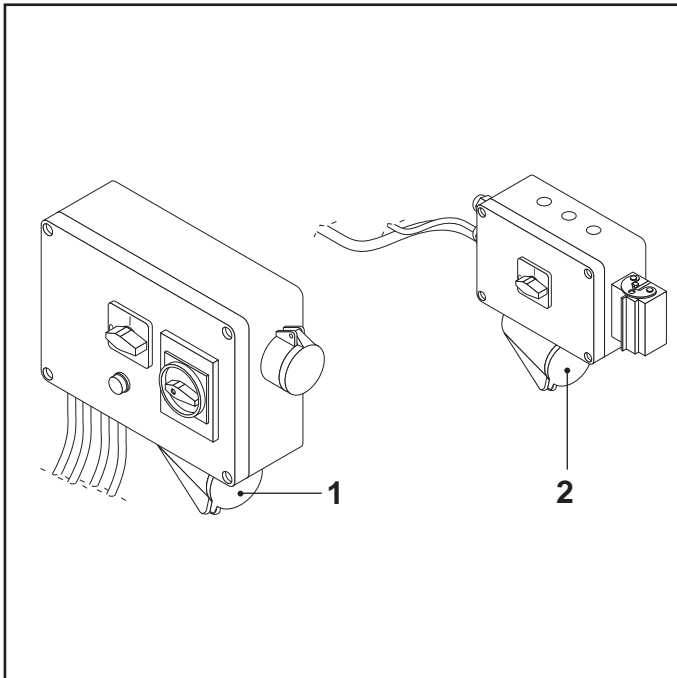


FIG.12

#### 5.4.1.1 MINI AVANT THREE-PHASE

Use a 3P+T cable with section:

- of 2.5 mm[squared] for a distance up to 20 m.
- of 4 mm[squared] for a distance up to 35 m.
- of 6 mm[squared] for a distance up to 50 m.

- Connect the electric power supply cable to the socket (FIG.13-REF.1).

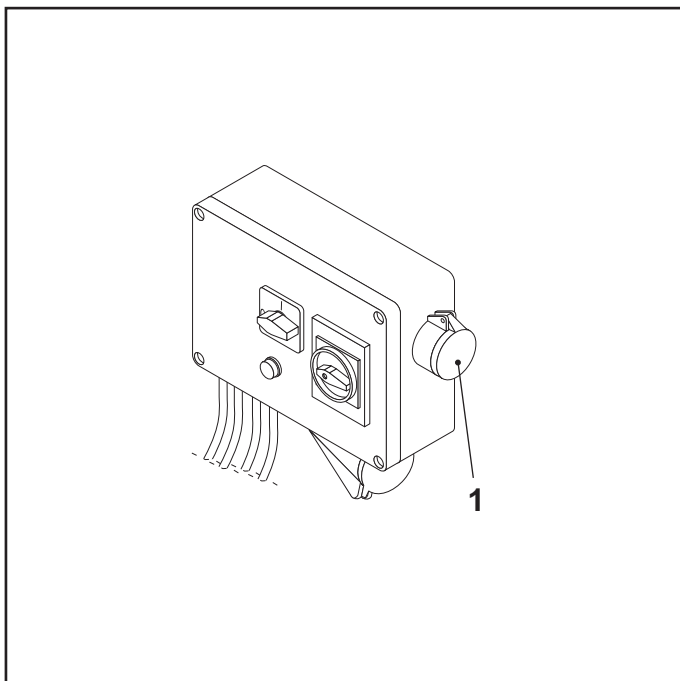


FIG. 13

-Check the correct rotation of the engine: It must be anti-clockwise, as indicated by the label positioned on the engine (FIG.14). If this is not the case, switch the engine off and invert the polarity, using a screwdriver on the power supply socket positioned in the lower part of the electric control board (FIG.15).

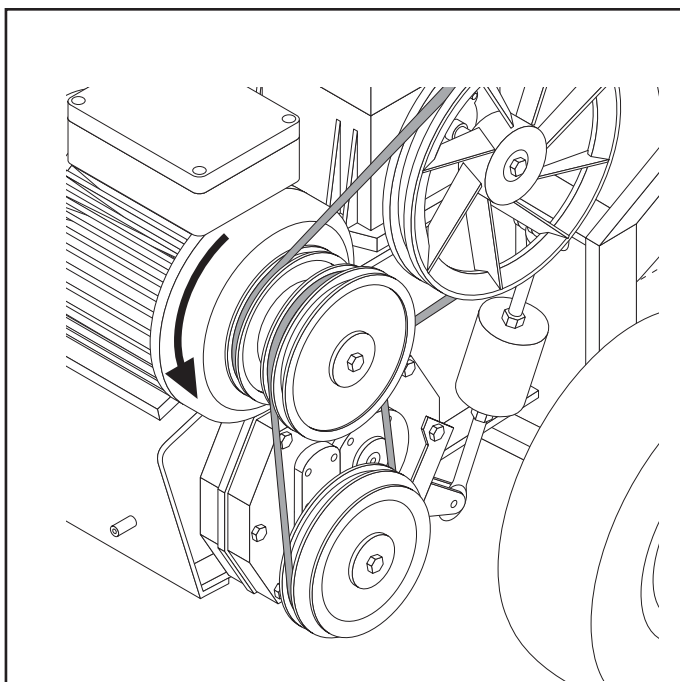


FIG.14

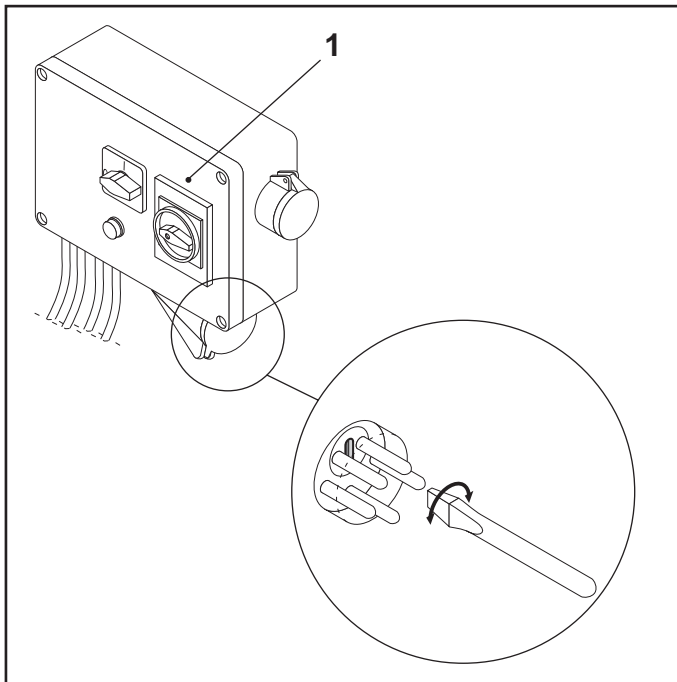


FIG.15

#### 5.4.1.2 MINI AVANT SINGLE-PHASE

Use a 2P+T cable with section:

- of 4 mm[squared] for a distance up to 20 m.
- of 6 mm[squared] for a distance up to 35 m.
- of 10 mm[squared] for a distance up to 50 m.

- Connect the electric power supply cable to the socket (FIG.13-REF.1).

MINI AVANT SINGLE-PHASE can be powered using the domestic mains network. To do this:

- check that the electric energy supplying body supplies the house with electrical power that is not below 3 kW.
- A skilled electrician, authorised by the owner of the house, sets-up an auxiliary power supply control board directly from the domestic meter (this must comply with safety Standards in force) compatible with the electric connections present on the machine: **DO NOT CONNECT THE MACHINE TO A SOCKET FOR CIVIL USE.**
- Do not connect any other household appliance or electric device to the mains while the machine is being used.

#### 5.4.1.3 MINI AVANT VARIO

Use a 2P+T cable with section:

- of 4 mm[squared] for a distance up to 20 m.
- of 6 mm[squared] for a distance up to 35 m.
- of 10 mm[squared] for a distance up to 50 m.

- Connect the electric power supply cable to the electric control board socket (FIG.16-REF.1).
- Connect the supplied electric cable (FIG.16-REF.2) to the electric control board socket inside MINI AVANT VARIO (FIG.16-REF.3).
- Connect the remote control to the socket (FIG.16-REF.4).

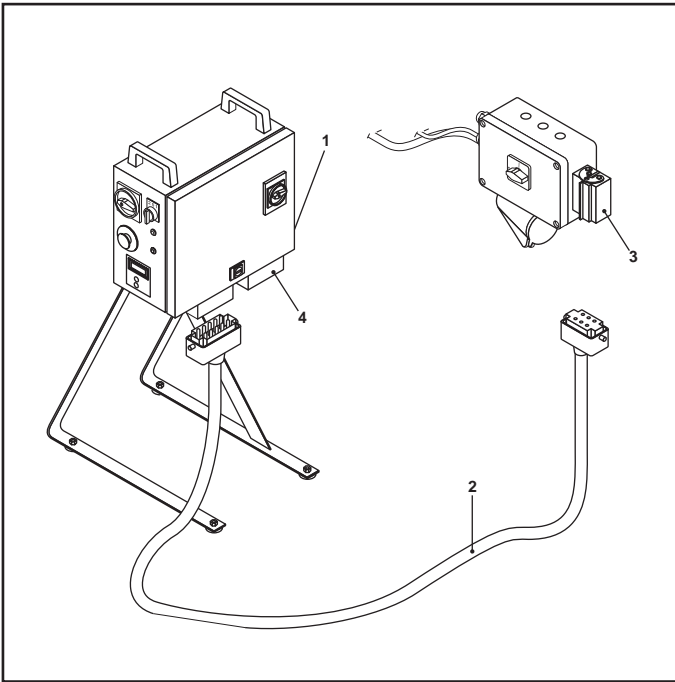


FIG.16

#### 5.4.2 Piping line connection

- Connect the piping to the flow valve body fitting (FIG.17).
- Connect the gun to the piping, eliminating the gasket: in this way the gun can turn with respect to the piping (FIG.18).
- Correctly tighten the cam fitting levers.
- Block the fitting levers using the safety spring (FIG.18-REF.1).

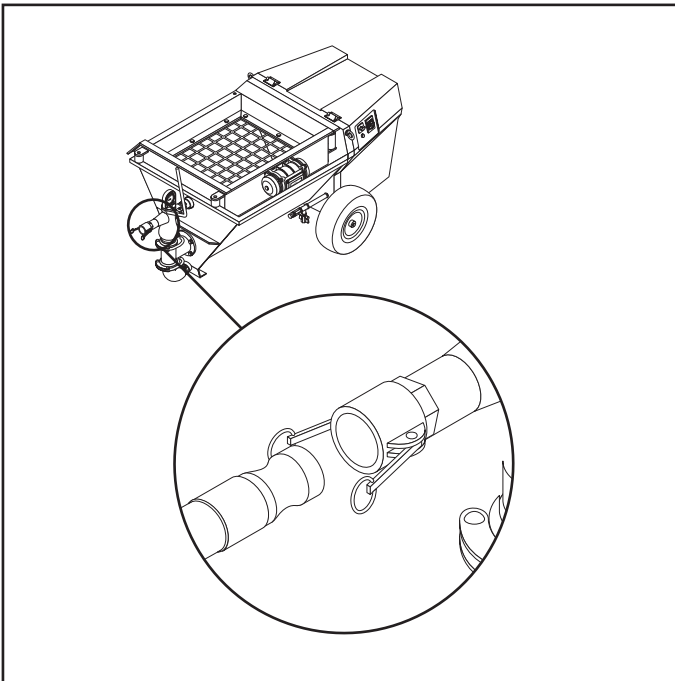


FIG.17

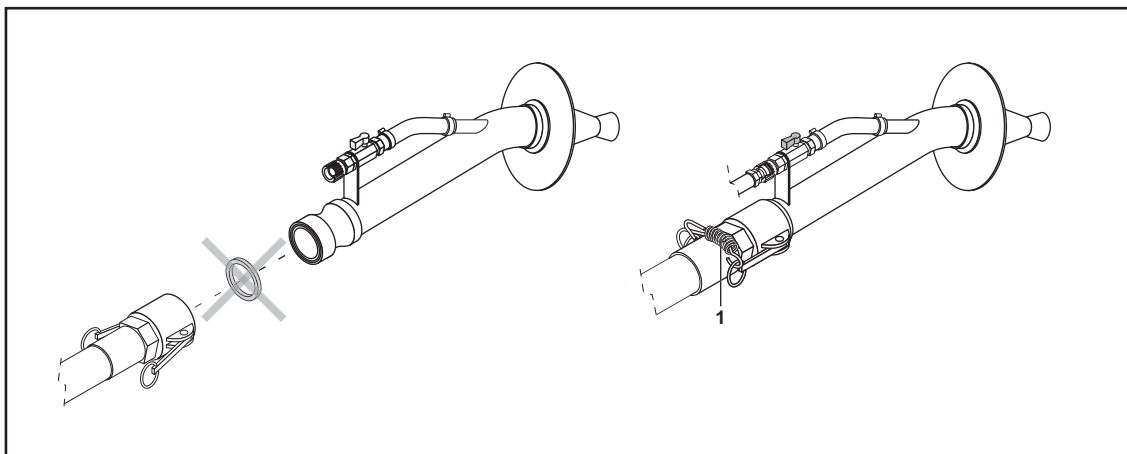


FIG.18

### 5.4.3 Air pipe connection

- Connect the air piping to the pneumatic control connection (FIG.19).
- Connect the air piping to the gun connection (FIG.19).

It is preferable to couple the mortar pipe and the air pipe along their entire length.

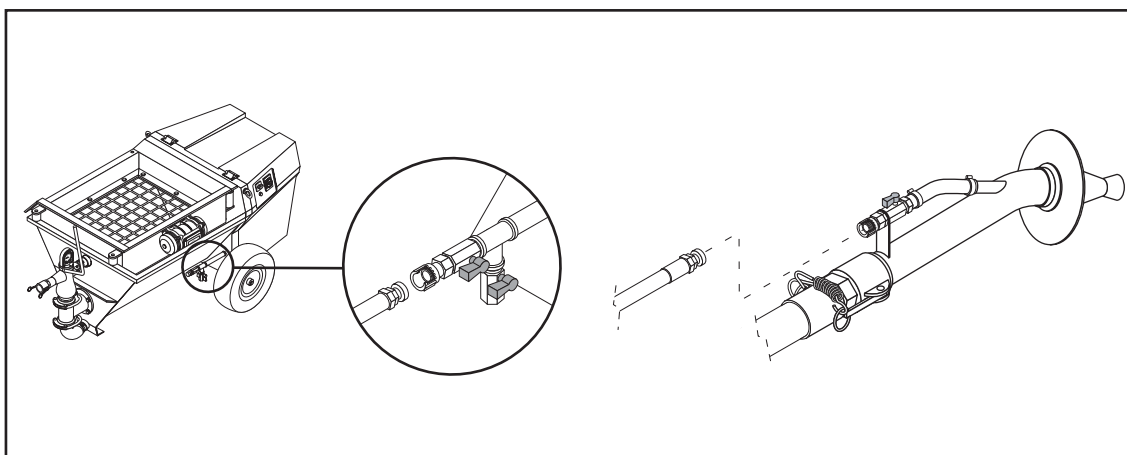


FIG.19

## 6.1 SAFETY DEVICES

### VIBRATING FRAME

The vibrating frame prevents contact with the moving parts inside the hopper. Its removal causes the machine to stop.

### BODYWORK

The bodywork protects from contact with internal hot and moving parts. The machine stops when it is opened.

### BY-PASS VALVE

Allows the depressurisation of the piping line and the circulation of material in the hopper.

### MATERIAL CONVEYOR PIPING LINE MANOMETER

The manometer is positioned between the machine flow and the first tract of flow piping. It is used to indicate the pressure in the piping.

### ENGINE ELECTRIC PROTECTION

It is made up of a magnet circuit breaker switch installed in the electric control board. It is used to isolate the electric power supply with consequent shutdown of the engine in the case of overload and/or short circuit.



***IT IS MANDATORY TO CONSTANTLY CHECK THE GOOD WORKING ORDER OF ALL THE SAFETY DEVICES INSTALLED ON THE MACHINE.***



***IT IS MANDATORY TO REPLACE ANY MALFUNCTIONING OR DAMAGED SAFETY DEVICES IMMEDIATELY.***

## 6.2 SAFETY SIGNS

The safety signs are adhesive labels affixed outside the machine (FIG.20).



*The safety signs must be kept clean and clearly visible at all times.*



*Damaged signs must be replaced immediately with new ones obtained from the manufacturer.*



*It is prohibited to remove or damage the safety signs affixed on the machine.*

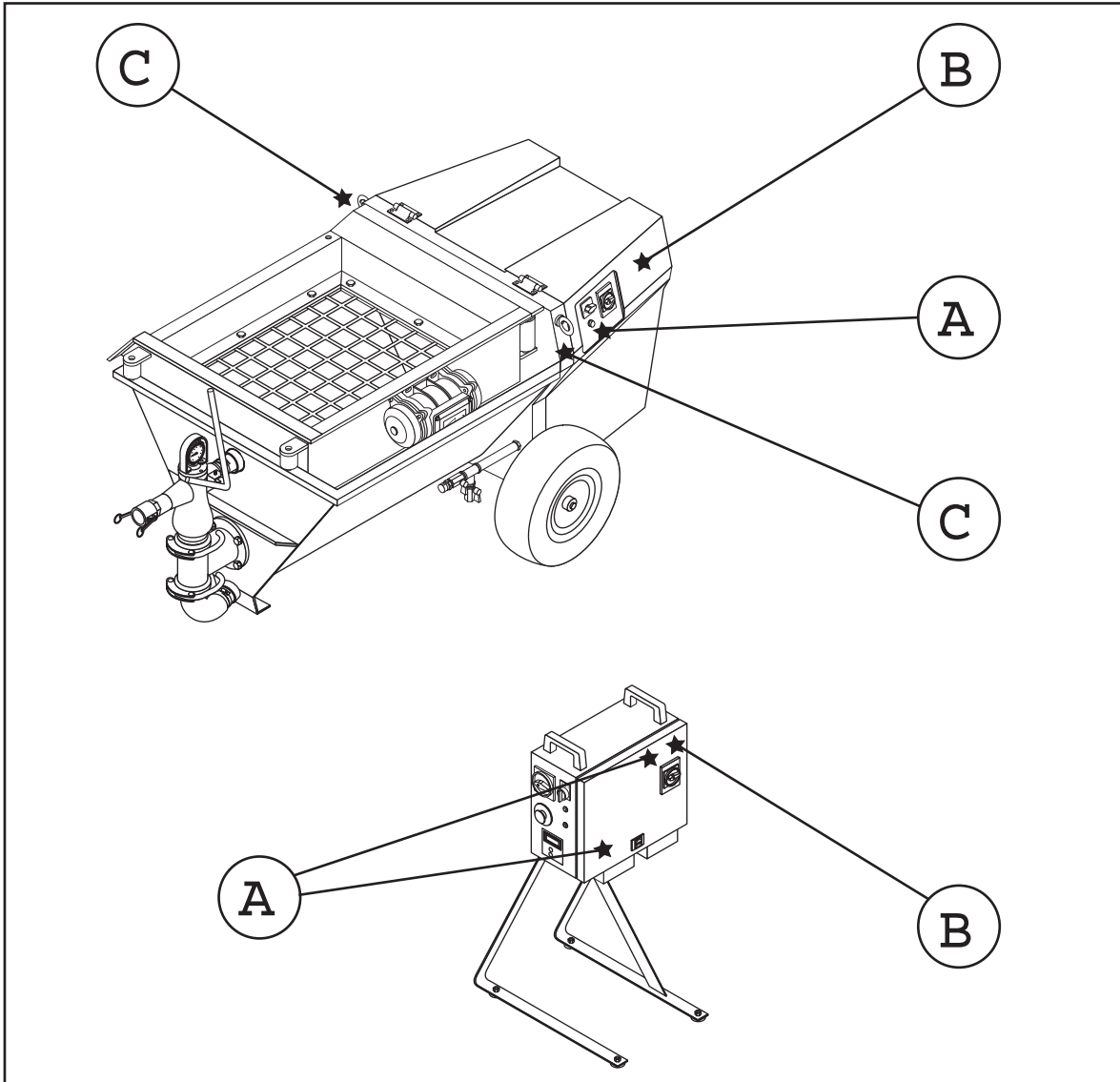





FIG.20



REF.	LABEL	DESCRIPTION
A		<b>Danger</b> Electric shocks
B		<b>It is mandatory</b> to read the instruction manual before starting to operate.
C		<b>It is mandatory</b> to lift the machine using the hooks indicated

TAB.04

## 6.3

Wearing individual protective devices is mandatory, in compliance with the Standards regarding health and safety in the workplace in force in the country of use.

The employers, staff in charge and operators must be aware of and apply these Standards.



**IT IS MANDATORY TO USE THE PROTECTION DEVICES INDICATED BY THE MANUFACTURER (TAB.05).**

MANDATORY SIGNS	DESCRIPTION
	IT IS MANDATORY TO PROTECT THE EYES.
	IT IS MANDATORY TO PROTECT HEARING.
	IT IS MANDATORY TO PROTECT THE HANDS.
	IT IS MANDATORY TO PROTECT THE FEET.

TAB.05

## 6.4 RESIDUAL RISKS

Following the instructions and recommendations contained in this manual will allow you to use the machine correctly and reduce any residual risks.

In particular:

Read the use and maintenance manual before starting the machine.

The operators at the machine and in the material delivery area must be trained to carry out their work following the instructions contained in this manual.

All maintenance must be carried out with the machine switched off.

Parts under pressure:

Check and guarantee the piping and make sure there are no signs of damage.

Make sure all the quick-release couplings and pipe joints are tight.

Do not open pipe fittings when the pipe is under pressure.

Hot parts:

Do not touch the engine and the reducer during functioning or after a prolonged standstill period.

Moving parts:

Do not insert foreign bodies through the protection grill when the machine is running.

Do not use the machine without the flow flange and the pump installed correctly.

Do not use the machine without the protection grill.

## 6.5 SAFETY RECOMMENDATIONS

- Operate with the bodywork closed.
- The machine must never run if the piping is not connected to the flow valve body.
- Check the state of wear of the pipes and relative joints every day, due to the danger of explosion, projection of the mixture and cutting, in the case of breakage and disconnection from the joints.
- Do not introduce any objects through the protection grill.
- Do not use the machine with inflammable materials, in explosive areas or with unsuitable fluids that cause corrosion and weakening.
- Move with extreme caution in proximity of the conveyor piping, due to the possibility of unexpected movements.
- If the material should block in the conveyor pipe, follow the relative instructions given in the following manual.

## 7.1 OPERATING PRINCIPLE

MINI AVANT accepts ready-mixed products (discharged into the hopper mainly by a concrete mixer) which is discharged over the vibrating frame. As well as being a safety device it also separates the particles that are too large to be pumped from the mixture. The sieved mixture falls into the hopper and the mixing device pushes it towards the piston pump.

The pump conveys the mixture towards the mortar pipe. A gun at the end of the mortar pipe joins the mixture flow rate to a flow of compressed air, which allows the opening of the jet of mixture at the gun nozzle outlet. The jet is then distributed on the wall.

The start and end of pumping are controlled by a cock positioned downstream from the air pipe, in proximity of the gun: by closing the air cock, MINI AVANT stops temporarily, opening the cock, MINI AVANT re-starts normal functioning.

It is possible to make the mixture circulate partially or completely in the hopper by acting on the by-pass lever.

If MINI AVANT is to be used only as a conveyor, the gun does not have to be mounted and the air cock described above is just a pumping start/end remote control.

MINI AVANT elaborates continuous cycle material until the mixture is present in the hopper.

## 7.2 PUMPABLE MATERIALS

Below finds some fundamental concepts in the realisation of mixtures.

- The aggregates must be within the correct particle size curve: (mixed sand with particle size variable from 0 to 6 mm.).
- There must be a correct amount of binder (about 350 - 400 kg per cubed metre of mixture) and in the proportions indicated below:
  - 2/3 hydraulic lime + 1/3 slack lime;
  - 1/3 hydraulic lime + 2/3 slack lime;
  - 1/3 cement + 2/3 slack lime;
  - 2/3 cement + 1/3 slack lime;
- Do not use plasticizer lime and in all cases as a percentage not exceeding 1/3 of the binder: in this case machine performance can decrease greatly.
- The mixture must have a plastic consistency (not too dry and not too wet).

### 7.2.1 Applications

MINI AVANT has many accessories and kits, thanks to which it can work with different types of materials.

- Thick-layer traditional plaster application (all versions).
- Thick-layer ready-mixed plaster application (all versions + ready-mixed and light materials pumping kit).
- Plaster and special mortar application for structural recovery and renovations. (all versions + ready-mixed and light materials pumping kit).
- Thin-layer finishings application (VARIO version).
- Pumping common or ready-mixed mortars for walls (all versions, with the ready-mixed product pumping kit).
- Filling of joints and cracks on facing masonry; filling joints on pre-fabricated structures (VARIO version).
- Controlled-pressure consolidation injections (all versions + injection device)
- Pumping self-levelling screeds (all versions).
- Application of light isolating materials (all versions + ready-mixed and light materials pumping kit).

### 7.2.2 Ready-mixed product and light isolating product kit

The kit for pumping the cement-based ready-mixed materials, not gypsum, includes:

- 1) gun for ready-mixed products [dia] 25.
- 2) 5 metres of rubber mortar piping, [dia] 25, complete with fittings.
- 3) Air pipe extension.
- 4) Protection grill (FIG.21).
- 5) Two steel ball valves (FIG.23-REF.1).
- 6) Red intake valve body (optional) (FIG.22-REF.3).
- 7) Valve seats (optional) (FIG.23-REF.2/3).



To use the ready-mixed product kit the vibrating sieve must be replaced with the protection grill (FIG.21).

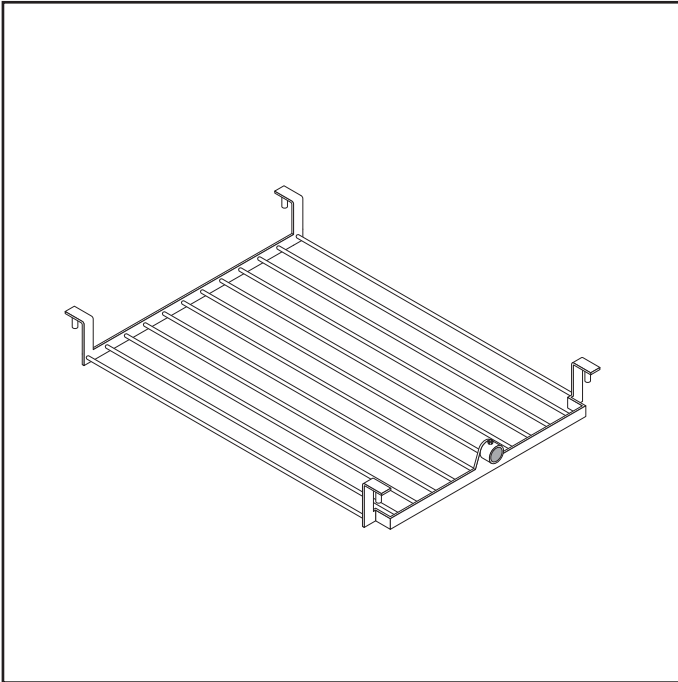


FIG.21

- Replace the intake valve body (optional):

- Release the two joints (FIG.22-REF.1).
- Loosen the 4 screw fasteners at the hopper and replace the valve body: to ease replacement, tighten two screws into the additional threaded holes (FIG.22-REF.2).
- Mount the dedicated valve body (FIG.22-REF.3).

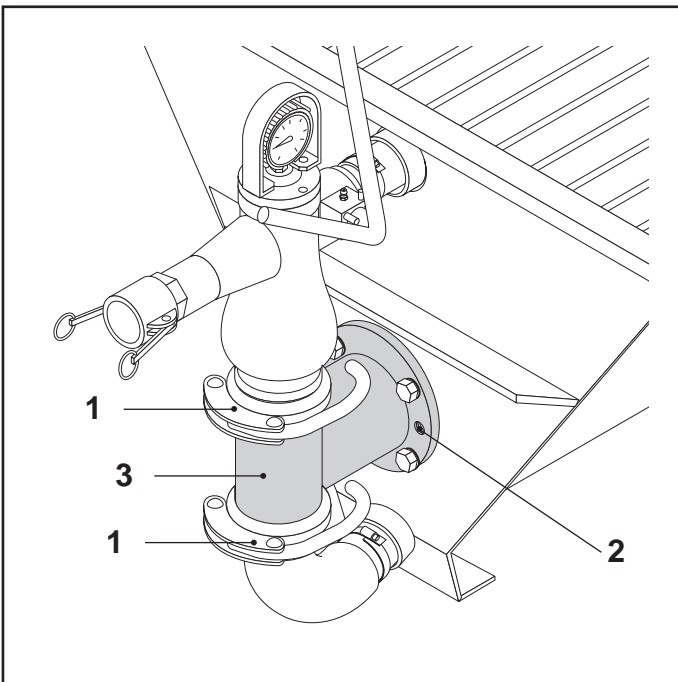


FIG.22

- Replace the rubber ball valves with the steel ball valves in the kit (FIG.23-REF.1).
- Replace the supplied valve seats with those for the kit (FIG.23-REF.2/3).

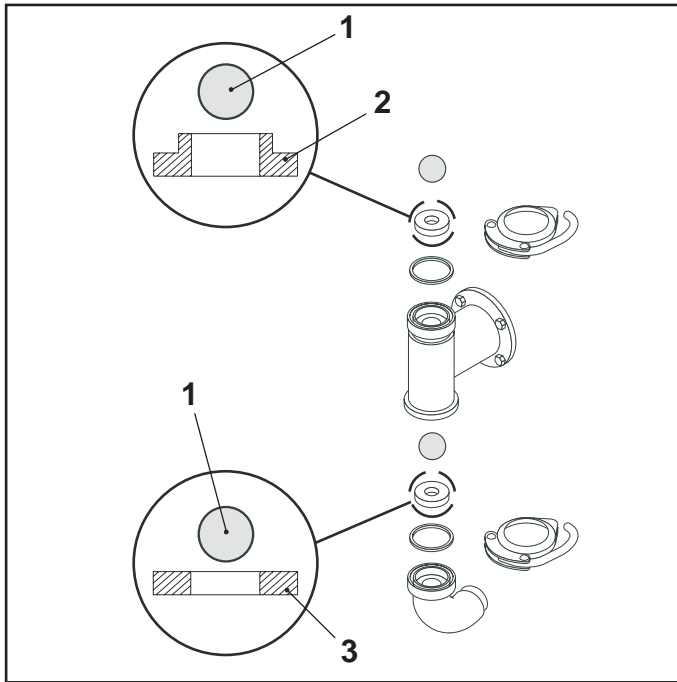


FIG.23



**The ready-mixed materials valve body cannot be used with traditional mixtures and with materials that have aggregates with particle size exceeding 3 mm.**

To increase the performance of MINI AVANT, with ready-mixed products it is a good idea to pump at second speed. To do this:

- Put the machine in "machine off" mode.
- Open the bodywork.
- Loosen the belt by acting on the belt tensioner, loosening the locking nuts (FIG.24-REF.1) and turning the buffer (FIG.24-REF.2).
- Shift the trapezoid belt onto the external groove on the engine pulley and the reducer pulley.
- Restore correct belt tension, by turning the buffer until it reaches its original position (FIG.24-REF.2) and tightening the locking nuts again (FIG.24-REF.1).
- Close the bodywork well.

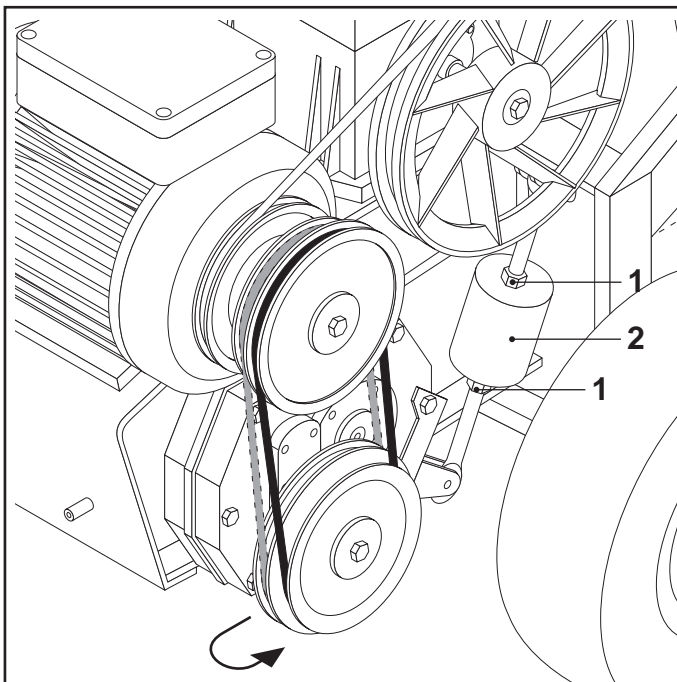


FIG.24

### 7.3 CHECKS BEFORE START-UP



**Before starting the machine, make sure that no-one, apart from staff in charge, are in the vicinity.**

- Check that the air flow cock (FIG.27-REF.6) is open, that the bleed cock is closed (FIG.27-REF.7) and that the air cock to the gun (FIG.28-REF.8) is open.
- Also check that the by-pass lever (FIG.25-REF.4) is in a vertical position (material recycle in hopper).
- Prepare 15 ÷ 20 litres of slurry separately (50% water + 50% cement or lime) and pour it into the hopper.
- Prepare the desired mixture (page 10) in the site cement mixer.



**Check that the bodywork is closed.**



**The machine must always function with material or water in the hopper. If this is not the case, premature wear will occur on the pumping piston (FIG.26).**

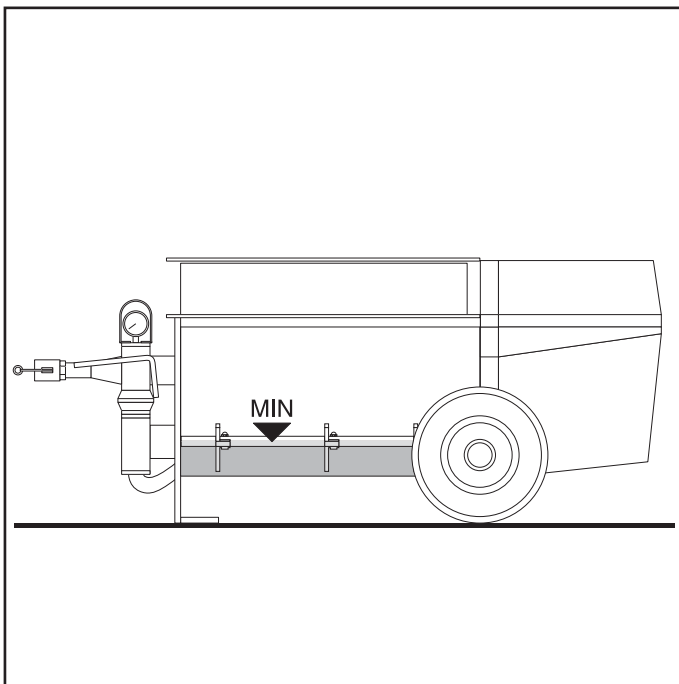


FIG.26

### 7.4 CONTROLS

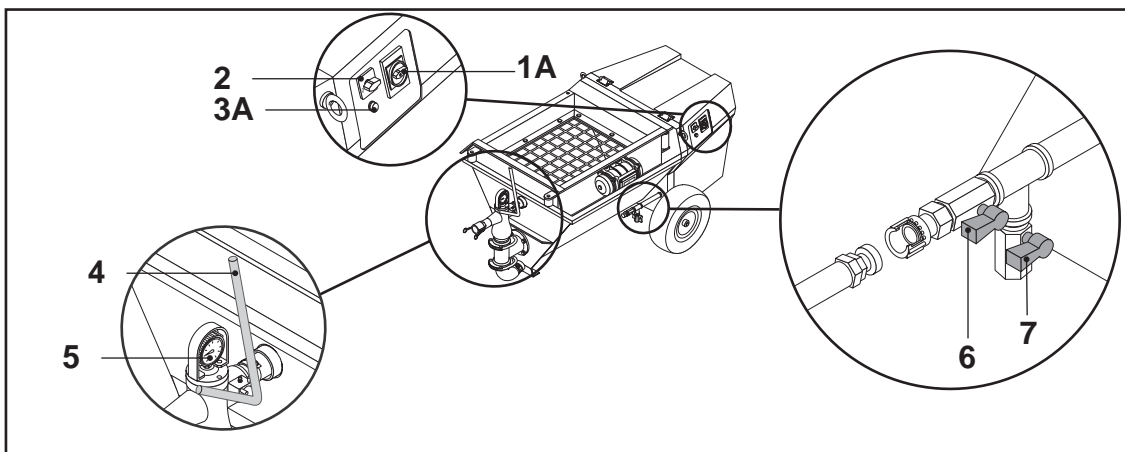


FIG.27

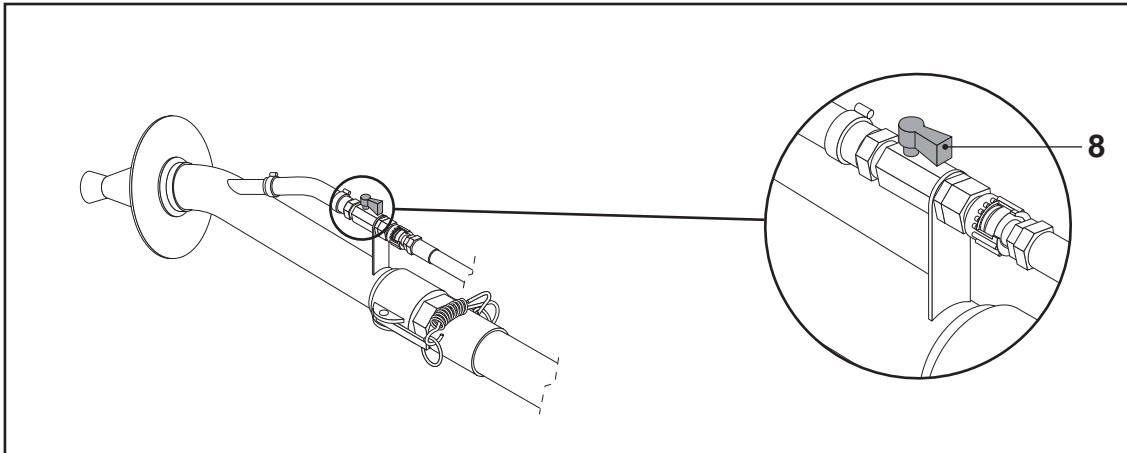


FIG.28

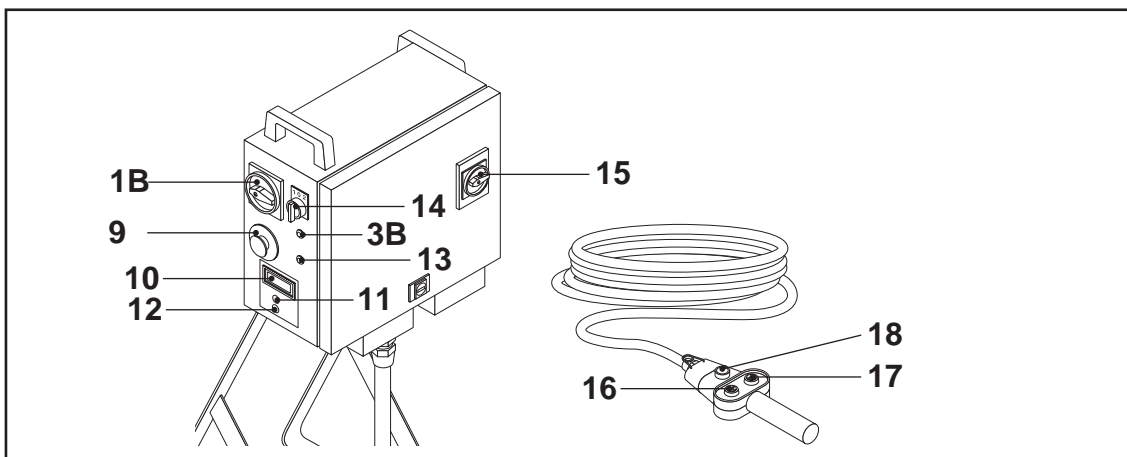


FIG.29

### MINI AVANT single-phase and three-phase

FIG.	REF.	DESCRIPTION
27	1A	Master switch
27	2	Vibrator switch
27	4	By-pass lever
27	5	Line manometer
27	6	Pneumatic control cock (to the machine)
27	7	Bleed cock
28	8	Pneumatic control cock (to the gun)
<b>INDICATORS</b>		
27	3A	Blue Correct voltage

### MINI AVANT VARIO

FIG.	REF.	DESCRIPTION
27	2	Vibrator switch
27	4	By-pass lever
27	5	Line manometer
27	6	Pneumatic control cock (to the machine)
27	7	Bleed cock
28	8	Pneumatic control cock (to the gun)
29	1B	Master switch
29	9	Emergency stop button
29	10	Inverter display
29	11	Frequency increase button
29	12	Frequency reduction button
29	14	Pneumatic/remote control selector switch



29	15	Motor start-up switch	
29	16	Frequency reduction button	
29	17	Frequency increase button	
29	18	Start/stop button	
<b>INDICATORS</b>			
29	3B	Blue	Correct voltage
29	13	Red	Inverter protection intervention

**TAB.06 -TAB.07**

**Note: Switches (FIG.27-REF.1A) and (FIG.27-REF.3A) are not present in the electric control board present inside the MINI AVANT VARIO version bodywork.**

A green indicator, normally on, and a red indicator, normally off, are present in the electric control board on the stand of the VARIO versions.

The green indicator (FIG.29-REF.3B) switches off when the sieve or safety grill and/or bodywork are raised or when the power supply voltage is not correct.

The red indicator (FIG.29-REF.13) switches on when the inverter intervenes to protect the engine from overloading: flashing messages appear on the display (FIG.29-REF.10) and on the inverter display (inside the electric control board on stand).

## 7.5 EMERGENCY STOP

For the emergency stop, turn the red master switch on yellow background to position "0" zero (Single-phase and Three-phase) (FIG.15-REF.1) or press the mushroom-shape switch on the electric control board (FIG.29-REF.9).

Proceed as described in paragraph 2.5 to put the machine in total safety.

## 7.6 STARTING THE MACHINE



**Use nitril fibre gloves for protection against cuts and abrasions, preferably models with CE 940072 certification and goggles that offer total protection for the eyes , with shatter-proof anti-misting lenses**



**The gun must never be aimed at the operator and towards third parties.**



**The machine must always function with material or water in the hopper(FIG.26). If this is not the case, premature wear will occur on the pumping piston.**

### 7.6.1 MINI AVANT SINGLE/THREE PHASE

- Start the engine by turning the master switch (FIG.27-REF.1A) to position 1 (ON).



**The indicator (FIG.27-REF.3A) switches on indicating that the power supply voltage value is correct. Switch-off of this indicator, even momentarily, is a symptom that the voltage is below the minimum value acceptable: check the power supply line.**

- Open and close the cock quickly two or three times (FIG.27-REF.6) to check the correct functioning of the pneumatic control: MINI AVANT must stop and re-start.

#### For MINI AVANT THREE-PHASE only

- Make sure that the engine turns in the right direction (see par.5.4.1.1 ).

- Check that the pump is engaged: the slurry must circulate in the hopper. If this does not happen:

- switch the machine off by turning the master switch (FIG.27-REF.1A) to position 0 (OFF).
- Open the upper joint of the pump unit (FIG.05-REF.2).
- Remove the ball valve.
- Pour slurry into the valve body (FIG.05-REF.3).
- Re-start.

### 7.6.2 MINI AVANT VARIO

- Start the engine by turning the master switch (FIG.29-REF.1B) to position 1 (ON).



**The indicator (FIG.29-REF.3B) switches on indicating that the power supply voltage value is correct. Switch-off of this indicator, even momentarily, is a symptom that the voltage is below the minimum value acceptable: check the power supply line.**

Note: the indicator on also indicates that the sieve or alternatively the safety grill is correctly positioned and the bodywork is closed properly.

- Position the engine protector knob (FIG.29-REF.15) in position 1.  
 - Position the selector switch (FIG.29-REF.14) in position:

- 1 to use the pump with the pneumatic remote control,
- 2 to use the pump with the electric remote control,

Make sure that MINI AVANT starts and stops normally by opening and closing the air flow cock (FIG.27-REF.6) or acting on the remote control start/stop selector switch (FIG.29-REF.18) depending whether the selector switch (FIG.29-REF.14) is respectively in position 1 or 2.

- Adjust the flow rate using the buttons (FIG.29-REF.11) to increase it and (FIG.29-REF.12) to decrease it. With the selector switch (FIG.29-REF.14) in position 2, on the remote control, increase the flow rate using the button (FIG.29-REF.17) and decrease the flow rate using the button (FIG.29-REF.16).

- The display (FIG.29-REF.10) shows the power supply frequency, variable between 10 and 70 Hz (the inverter display, inside the control board on stand indicates the same value).

- Check that the pump is engaged: the slurry must circulate in the hopper. If this does not happen:
  - switch the machine off by turning the master switch (FIG.29-REF.14) to position 0 (OFF).
  - Open the upper joint of the pump unit (FIG.05-REF.2).
  - Remove the ball valve.
  - Pour slurry into the valve body (FIG.05-REF.3).
  - Re-start.

### 7.6.3 Start-up

- Take the by-pass lever (FIG.27-REF.4) to the horizontal position: the machine starts to pump slurry into the piping.

- Before the slurry ends, pour the mixture prepared into the cement mixture on the vibrating frame. The vibrating frame must have been switched-on previously using the switch (FIG.27-REF.2).

- The slurry starts to escape from the gun and when it has finished, the mixture will start to escape.

MINI AVANT is now operational and can be stopped by acting on the air cock positioned on the gun (for all versions) or on the button (FIG.29-REF.18) (for VARIO version only).

### Working pressure

During the pumping phase, the operator at the machine must check that the manometer (FIG.27-REF.5) never exceeds 12-15 bar.

A higher pressure indicates a blockage in the mortar piping or in the gun. If this happens:

- stop the machine,
- discharge the pressure in the pipes by raising the by-pass lever,
- remove the blockage (see par.10.1.2).

A high pressure value (over 15 bar) indicates difficulty in pumping the mixture. This can be caused by the quality of the mixture to be pumped (in this case, correct it to improve pumpability) or by the excessive length of the mortar pipe (it is advised not to exceed 30 metres of piping).

Working with pressures that are too high can lead to intervention of the safety systems of the electric components.



***During all operations, the air cocks must be completely open or completely closed. Partial opening causes machine shutdown.***



***When the vibrating frame or grill is raised (if ready/mixed, materials are used) or if the bodywork is opened, the safety devices intervene and the machine stops automatically.***

To re-start the machine:

- re-position the vibrating frame and close the bodywork.
- Turn the master switch (FIG.27-REF.1A) or (FIG.29-REF.1B) first to position 0 (OFF) and then to position 1 (ON).

In the VARIO version, perform this operation with the selector switch (FIG.29-REF.14) in position 0.

## 7.7 CLEANING AND THE END OF A WORK SESSION

When the bottom of the mixing device can be seen during the conclusive mixture\* of the work session, raise the by-pass lever and stop the pump using the master switch. The conclusive mixture must be a little more fluid than normal.

- Disconnect the mortar pump flow pipes (FIG.05-REF.4) and insert one or two sponges into the mouth of the mortar pipe (FIG.30). All of the material present in the piping can be used (projected or recovered in a bucket).

A) When it is projected, the approach of the sponges to the gun is shown by an increasingly more fluid flow of material and no longer sufficiently plastic to attach to the wall: in this situation, it is a good idea

- stop pumping.
- Remove the gun.
- Re-start pumping to expel the sponges.
- Wash the gun carefully, disassembling the deflector (FIG.31-REF.1).

B) When recovered in a bucket.

- Remove the gun (and wash it carefully, disassembling the deflector).
- Discharge the residual material into the container.

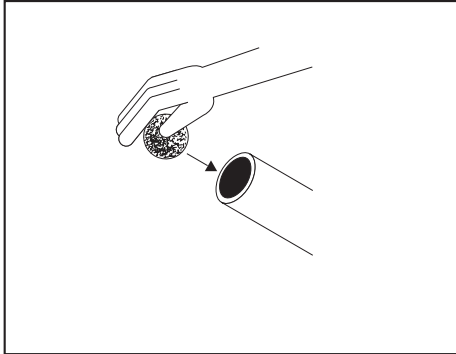


FIG.30

- Repeat the pipe cleaning operation until you are sure that they are clean.

- Check that the hole in the air nozzle (FIG.31-REF.2) is free (clean it with iron wire if necessary).

- Remove the vibrating frame and wash it.

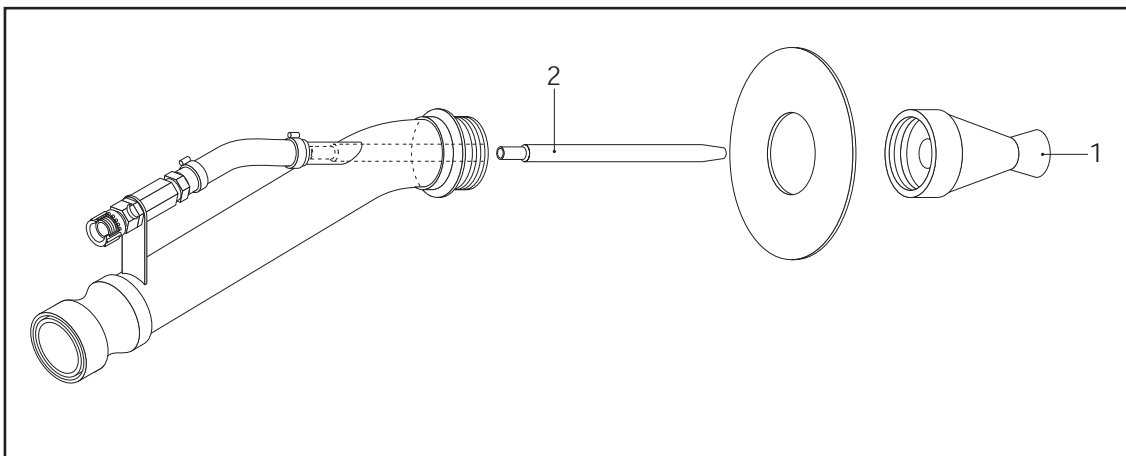


FIG.31

- Disassemble the intake collector (FIG.32-REF.1) and the flow valve body (FIG.32-REF.2).

- Carefully wash these elements and the intake valve body (FIG.32-REF.3) remained fixed to the machine.



**If the valve seats are also disassembled (FIG.32-REF.4), re-mount them correctly, respecting the positions indicated in FIG.32.**

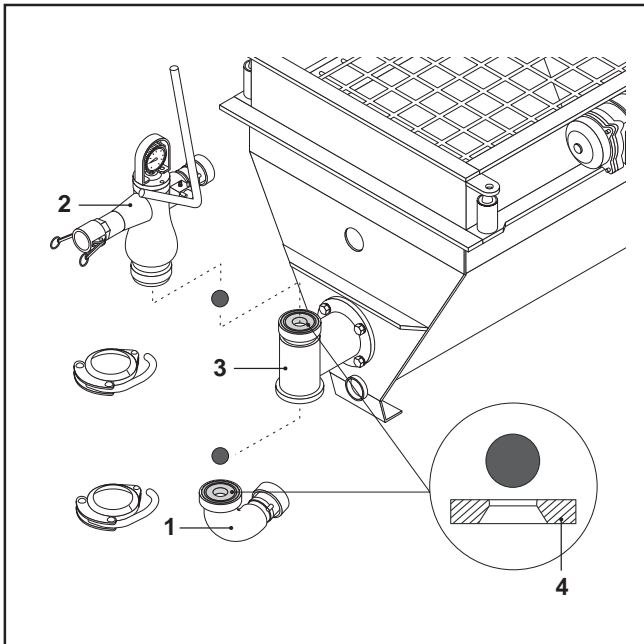


FIG.32

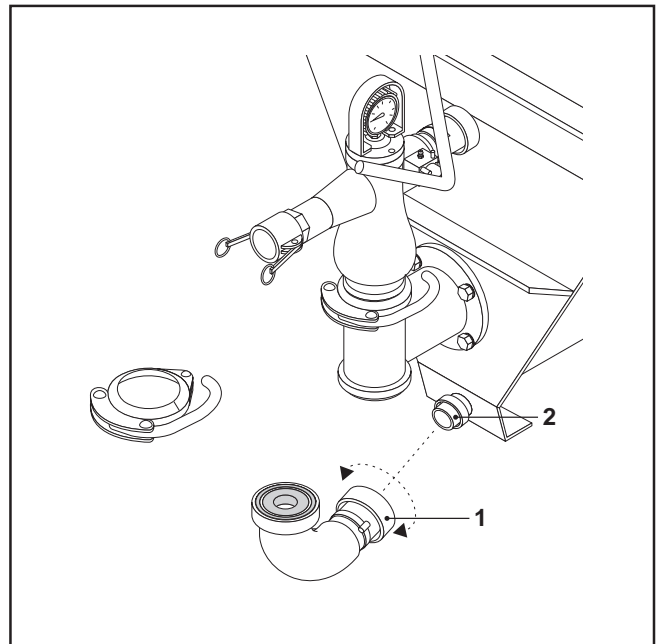


FIG.33

- Use a jet of water to wash the hopper, mixing device and pump intake.
- Re-mount the vibrating frame.
- Re-mount the intake collector and the flow valve body, checking that the sealing ring (FIG.33-REF.1) adheres perfectly to the profile (FIG.33-REF.2). This confers perfect sealing between the two elements. The contact surfaces must be perfectly clean.
- Fill the hopper with water, connect the mortar piping, lower the by-pass lever and start the machine.
- Repeat the operation until clean water escapes from the piping.
- Switch the machine off using the master switch positioned on the electric control board.
- Remove the water remaining inside the hopper by opening the lower joint in the pump unit and sliding the intake collector out from the sealing ring (FIG.33-REF.1).

## 8.1 TO BE CARRIED OUT BY OPERATOR

### 8.1.1 Operations to be performed daily

#### - Check compressor oil

Check the compressor oil level at the start of the shift, before starting work: the compressor oil level must always correspond to the maximum level indicated on the stick (FIG.34) and the measurement must be taken with MINI AVANT level (FIG.07). It is unlikely that the compressor works in a perfectly horizontal position on site, as recommended by the manufacturer. Therefore, to guarantee correct lubrication comply with that stated above scrupulously.

Use multigrade SAE 15W40 oil.

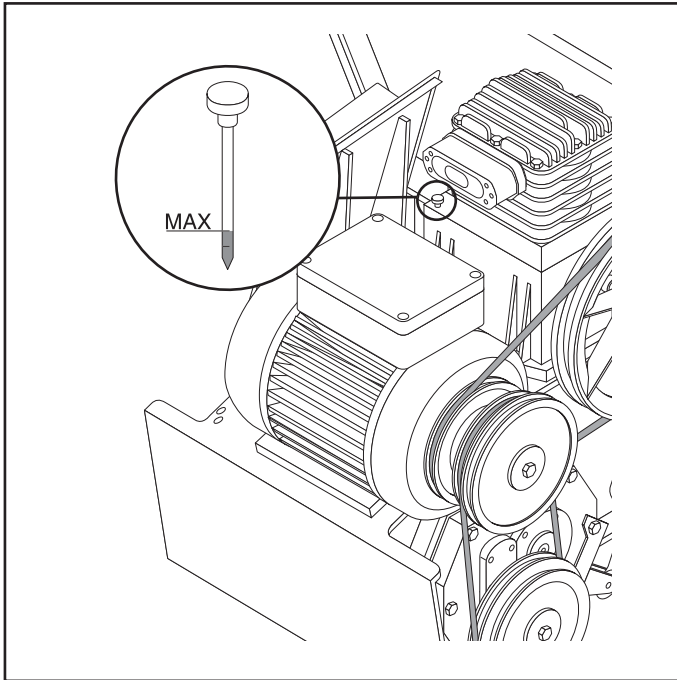


FIG.34

#### - Greasing

- Grease the by-pass lever using the greaser (FIG.35-REF.1) positioned on the flow valve body of the piston pump.

- Grease the pendulum using the greaser (FIG.36-REF.1) positioned on the machine body, under the eyebolt (electric control board side).

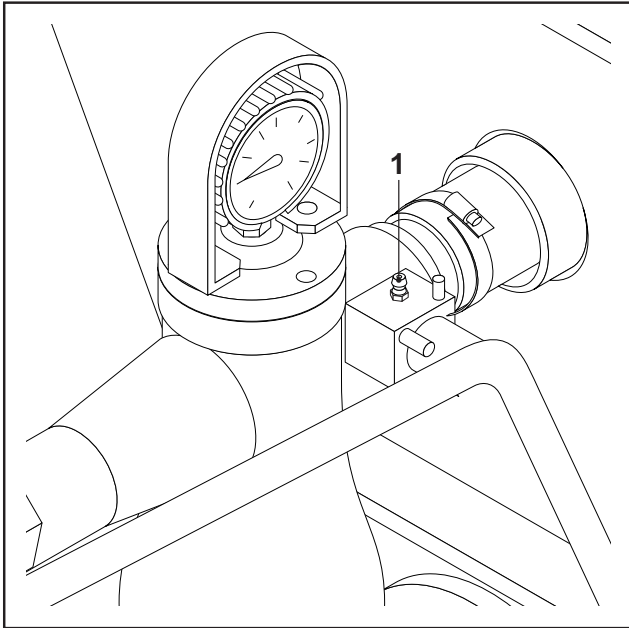


FIG.35

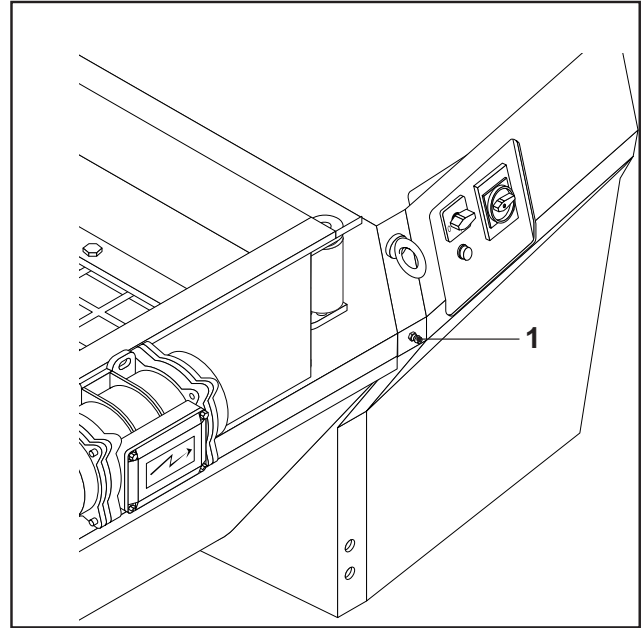


FIG.36

- **Preventive care**

AT the end of the work session it is good practice to spray the machine with liquid that prevents the formation of deposits of material during the successive work session.

**8.1.2 Operations to be performed every week**

- **Check and clean the compressor air filter**

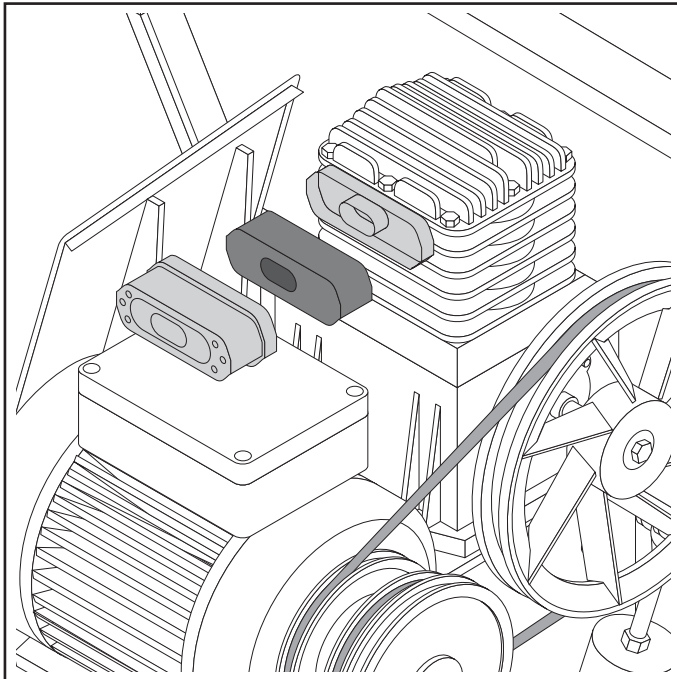


FIG.37

### - Membrane control

Check that the membrane (FIG.38-REF.1) is integral: the rubber must not be split.

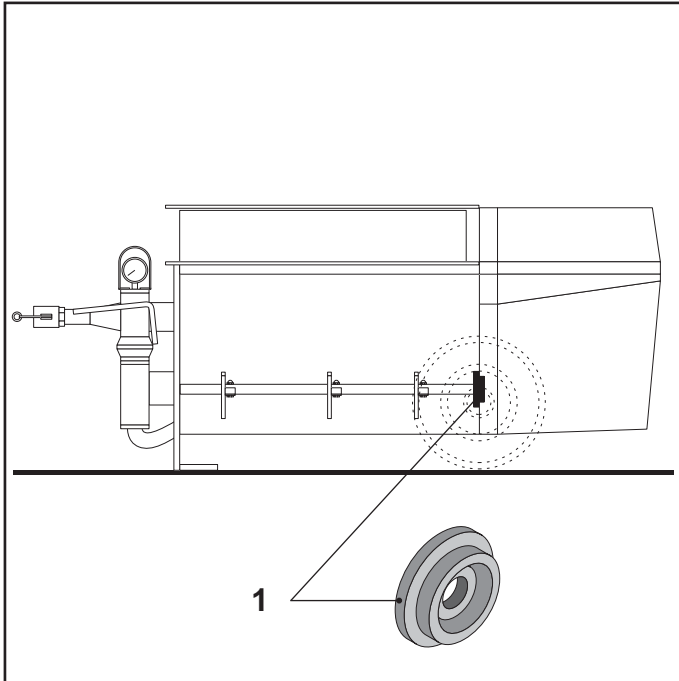


FIG.38

### 8.1.3 Operations to perform every 500 hours

#### - Compressor oil replacement

Eliminate the oil by loosening the cap positioned at the base of the compressor (TAB.6, NP 5) and replace it with 0.485 litres of SAE 15W40 multigrade oil.



***The waste compressor oil must be disposed of in compliance with the Laws/Standards in force on the subject.***



## 8.2 TO BE CARRIED BY QUALIFIED STAFF

### 8.2.1 Operations to be performed every 6 months or every 500 hours

- Check the flexible air pipe.
- Inspect the electric system.
- Check and replace the transmission belts if necessary (FIG.39-REF.1) and (FIG.39-REF.2).
- Check piston, ball valve and membrane wear.
- Check manometer functioning.
- Check functioning of the by-pass lever (no play and by-pass valve sealing).
- check that there are no anomalies.
- Check the efficiency of the buffer (FIG.39-REF.3): the efficiency of this element guarantees the integrity of the machine parts in the case of overloads generated by blockage in the valves.

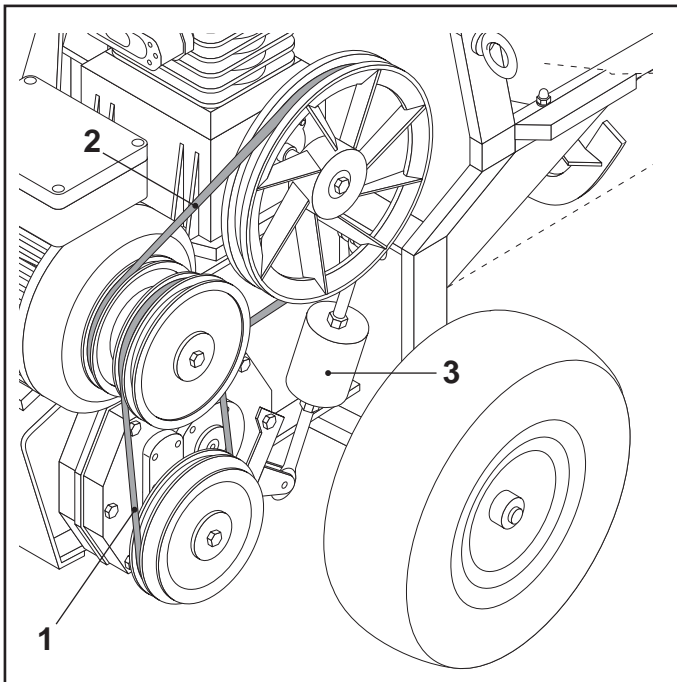


FIG.39

### 8.2.2 Operation to be performed every 5000 hours

#### - Reducer oil replacement

Eliminate the oil by loosening the cap positioned on the side of the reducer and replace it with 1.2 kg of ELF Reductelf SP220.



**The waste compressor oil must be disposed of in compliance with the Laws/Standards in force on the subject.**

**9.1 GENERAL RECOMMENDATIONS**

Follow the local regulations in the country of use when scrapping the machine.

Separate the machine parts according to the type of material (plastic, rubber, iron, etc.).

The oil and the storage cell must be handed over to authorised firms specialising in the disposal of polluting products.

## 10.1 THE MIXTURE DOES NOT ESCAPE FROM THE GUN

### 10.1.1 Gun blockage.

#### EFFECT

High pressure (over 12 bar) indicated by the line manometer, as well as the non-escape of material from the gun.

#### CAUSE

- Mixture too thin.
- Material deposits
- Stone inside the gun
- Deflector with passage too narrow in relation to the particle size of the mixture.

#### SOLUTION

- Stop the machine using the master switch.
- Discharge the pressure in the material flow pipes by turning the by-pass lever to a vertical position (FIG.40-REF.1).
- Wait for the pressure indicated by the manometer (FIG.40-REF.2) to fall to zero.



**Always discharge the pressure in the piping before disassembling the deflector or the gun. The line manometer must indicate a pressure of zero bar. On trampling the mortar piping must go limp.**

- Disassemble the deflector and if necessary the gun and remove the cause of the blockage.
- Before re-mounting the deflector or the gun, make sure that the nozzle is free (clean it if necessary using wire).
- Re-start the machine to check that the material escapes freely from the piping.

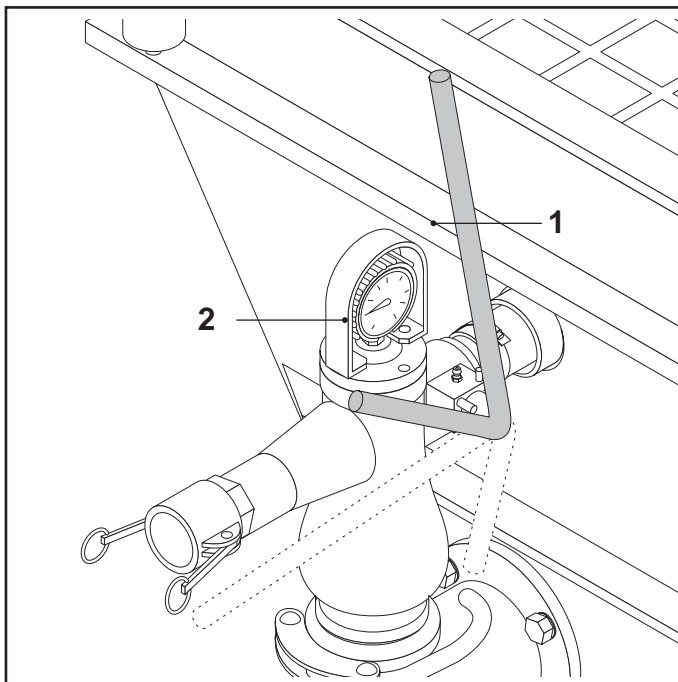


FIG.40

### 10.1.2 Blocked piping

#### EFFECT

High pressure (over 12 bar) indicated by the line manometer, as well as the non-escape of material from the gun.

#### CAUSE

- Incorrect mixture.
- Standstill too prolonged.

#### SOLUTION

- Close the air cock to the gun: the machine stops.
- Stop the machine using the master switch.
- Discharge the pressure in the flow pipes by turning the by-pass lever to a vertical position (FIG.40-REF.1).
- Wait for the pressure indicated by the manometer (FIG.40-REF.1) to fall to zero.



**Always discharge the pressure in the piping before disassembling the deflector or the gun. The line manometer must indicate a pressure of zero bar. On trampling the mortar piping must go limp.**

- Identify where the piping line is blocked: in this zone the mortar pipe is hard and rigid.



**The most critical points are in correspondence with the fittings.**

- Disconnect the mortar pipe, strike it with a mallet in correspondence with the blocked zone and eliminate the hardened material (FIG.41).
- Start the machine for a few seconds to check that the pipe has been freed: the material must escape regularly.
- Pour slurry into the tract of disconnected pipe downstream from the segment just freed.
- Re-connect the piping line and re-start.

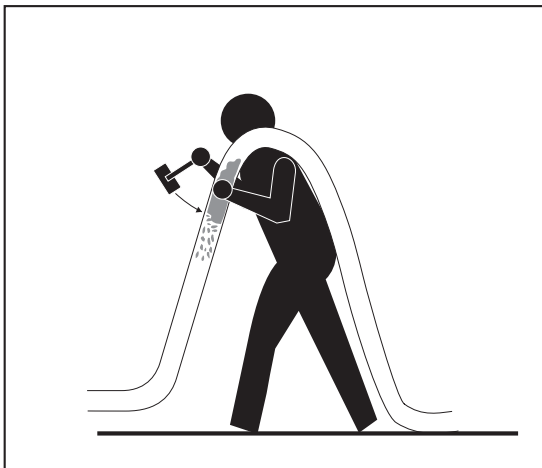


FIG.41

### 10.1.3 Pipe bent

#### EFFECT

The effect is the same as a blocked mortar pipe.

#### SOLUTION

Look for the bend and straighten it.

### 10.1.4 Valves blocked

#### EFFECT

Material does not escape from the piping and

- the manometer indicates a pressure that is too low (below 5 bar),
- the manometer needle does not oscillate

#### CAUSE

Mixture too thin (not enough binder) can determine a blockage in the valves.

## SOLUTION

- Stop the machine using the master switch.
- Discharge the pressure in the line pipes by taking the by-pass lever to a vertical position (FIG.40-REF.1).
- Wait for the pressure indicated by the manometer (FIG.40-REF.2) to fall to zero.
- Disassemble the valves and wash them well, eliminating any deposits (FIG.42).
- Modify the mixture according to that indicated in paragraph 7.2.
- Empty the hopper (if necessary, use a jet of water to evacuate all of the material).
- Re-mount the valve body.
- Make the correct mixture and re-start.

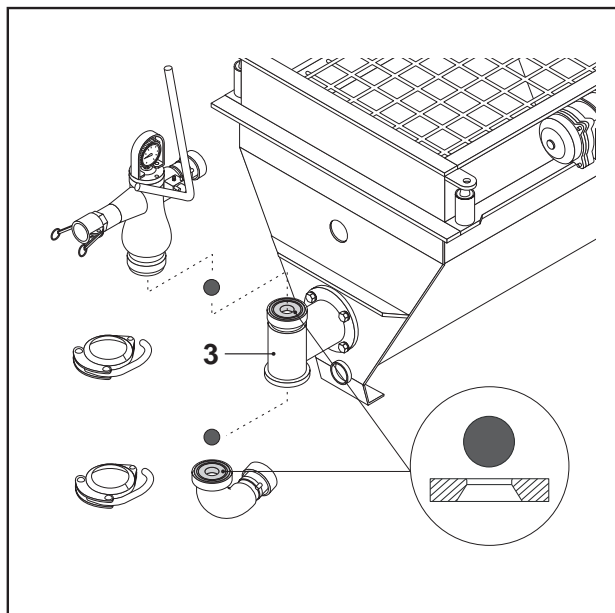


FIG.42

## 10.2 OPERATOR INTERVENTION

PROBLEMS	CAUSES	SOLUTIONS
<b>MORTAR DOES NOT ESCAPE FROM THE GUN</b>	Gun blocked	See par. 11.1.1
	Material pipe blocked	See par. 11.1.2
	Valves blocked	See par. 11.1.3
	Material pipe bent	See par. 11.1.4
	Belt loose	Pressure below 10 bar, the belt slips. Tension the belt.
<b>THE MORTAR ESCAPES DISCONTINUOUSLY</b>	Unsuitable piping	<ul style="list-style-type: none"> <li>• Use original Turbosol piping only, suitable for MINI AVANT.</li> <li>• Check piping length (minimum 30 metres).</li> </ul>
	Mixture too greasy	<ul style="list-style-type: none"> <li>• Remove binder.</li> </ul>
	Insufficient material	<ul style="list-style-type: none"> <li>• Add material to the hopper.</li> </ul>
	Worn ball valves	<ul style="list-style-type: none"> <li>• Check the integrity of the valves and replace them if necessary.</li> </ul>
	Belt loose	<ul style="list-style-type: none"> <li>• Pressure below 10 bar, the belt slips. Tension the belt.</li> </ul>
<b>MORTAR DRIPPING AT THE GUN OUTLET</b>	Deflector with hole that is too large	<ul style="list-style-type: none"> <li>• Replace the deflector with a smaller hole.</li> </ul>
	Mixture too greasy	<ul style="list-style-type: none"> <li>• Modify the composition of the mixture (see par. 7.2).</li> </ul>
	Insufficient air	<ul style="list-style-type: none"> <li>• Check that the compressor filter is clean and replace it if necessary.</li> <li>• Pressure below 10 bar, the belt slips. Tension the belt.</li> </ul>
<b>THE PLASTERING MACHINE STARTS-UP ALONE DURING PAUSES</b>	Air loss in the piping.	<ul style="list-style-type: none"> <li>• Check the air piping, in particular the fittings and identify the air leak.</li> </ul>

PROBLEMS	CAUSES	SOLUTIONS
THE PLASTERING MACHINE DOES NOT START-UP	Motor-protector intervention.	<ul style="list-style-type: none"> <li>• Rearm the motor-protector: in the SINGLE-PHASE and THREE-PHASE versions turn the master switch (FIG.27-REF.1A) to position 0 and then to position 1 again;</li> <li>the inverter intervenes in the VARIO version and the red indicator lights-up. Turn the master switch (FIG.27-REF.1B) to position 0, wait for at least 1 minute (the inverter display inside the control board must stop flashing), and then re-start the machine.</li> <li>• If the motor-protector intervention is repeated apparently without any anomaly occurring, request that the power supply line is checked by qualified, authorised staff.</li> <li>• Insufficient power supply cable section: use cable with suitable section (see par. 5.4.1).</li> <li>• Check the electric voltage.</li> <li>• Close the vibrating frame and casing correctly.</li> </ul>
	Air line blocked.	<ul style="list-style-type: none"> <li>• Check that the cock to the machine is open, that the air pipe is not bent and that the gun nozzle is free.</li> </ul>

PROBLEMS	CAUSES	SOLUTIONS
THE PLASTERING MACHINE STOPS ALONE DURING WORKING	Air line partially blocked.	<ul style="list-style-type: none"> <li>• Check that the cock to the machine is not partially closed, that the air piping is not bent, and that the nozzle is not partially blocked.</li> </ul>
	The motor-protector intervenes.	<ul style="list-style-type: none"> <li>• Check that the work pressure indicated by the mortar piping manometer does not exceed 12 bar. Modify the mixture if this occurs (see par. 7.2) and check the piping (see par. 11.1.2).</li> </ul>



*For anomalies different to those indicated above, contact the authorised after-sales service.*

**11.1 RESPONSIBILITY**

The person in charge of the machine must make sure that the operator is fully acquainted with the instructions contained in this use and maintenance manual and has been specifically trained for carrying out the operations described herein.

The Manufacturer's warranty is voided if the machine is not used in compliance with the instructions in this manual, and the manual must accompany the machine at all times.

Operators are required to be fully instructed and trained on the machine's operation and to sign this operation and maintenance manual where it says "Read and approved".

Operators that refuse to do so are not authorised to use the machine.

Signature of person responsible \_\_\_\_\_

Read and approved \_\_\_\_\_

Read and approved \_\_\_\_\_

Read and approved \_\_\_\_\_

Signature of operator \_\_\_\_\_

Read and approved \_\_\_\_\_

Read and approved \_\_\_\_\_

Read and approved \_\_\_\_\_



## 11.2 WARRANTY

The machines manufactured by Turbosol Produzione S.p.A. are guaranteed for a period of 12 (twelve) months or 1000 working hours - whichever comes first - starting from the date of delivery of the machine to the final-user, and in any case no longer than 18 (eighteen) months after the date of shipment. The machine's date of delivery to the final-user must be entered in the warranty certificate, which accompanies all new machines that leave the factory.

The warranty shall be effective only if the Manufacturer receives the card attached to the warranty certificate, regularly filled out in all its parts and signed by the Buyer, within 30 days from the machine's date of delivery.

The warranty covers all manufacturing and material defects.

Machine parts supplied by Turbosol Produzione S.p.A. but manufactured by third parties are covered by warranties issued by said third parties to Turbosol and transferred by Turbosol to the final-user.

In case of defects arising during the warranty period, only the following are authorised to intervene: the Manufacturer or Organizations expressly authorised by the Manufacturer. Final-users shall be responsible for having the machine delivered to the premises of the above Organizations, during regular working hours.

The faulty parts must be delivered free of carriage to the Manufacturer, who repairs or replaces any parts free of charge which, in the Manufacturer's unquestionable opinion, show defects in quality. The parts replaced shall remain the property of the Manufacturer.

All shipping costs, as well as any costs for work carried out by the Manufacturer's staff, shall be borne by the Buyer.

Repairs or replacements shall not extend nor renew the duration of the warranty period. The warranty does not cover parts that are subject to normal wear or deterioration, such as: valve seats and rubber ball valves, pistons and liners, rubber stators and augers, bushings, baffles, mixing blades, tank protection shields, tanks, wear plates and cones, filters, etc.

The Buyer shall forfeit all warranty rights in case of failure to observe payment terms even for one time only, or if the defects are found to derive: from facts owing to the Buyer, to the Buyer's employees or to third parties, if the defect is caused by misuse, incorrect installation, improper use or use non-conforming to the instructions contained in the use and maintenance manuals supplied with the machine.

The warranty shall become null and void if the injection systems are damaged by unsuitable or contaminated fuel, if the electric systems are damaged by an unsuitable power supply or by components such as relays, capacitors, contactors, remote controls, etc. These items are covered only by the suppliers' warranties.

Likewise, the warranty shall become null and void in the case of unauthorised tampering, use of non-original spare parts or rubber hoses other than those supplied by the Manufacturer.

The Manufacturer shall be exempt from any liability regarding the impossibility of using the product or for damages caused by suspension of work or direct or indirect loss of profits, as well as for damages caused by removing the shields or the sumps protecting the moving parts or the safety devices.

Any faults and defects must be reported to the Manufacturer in writing under the terms prescribed by law.

In case of disputes in the interpretation of the above clauses, the original Italian-language text shall prevail.