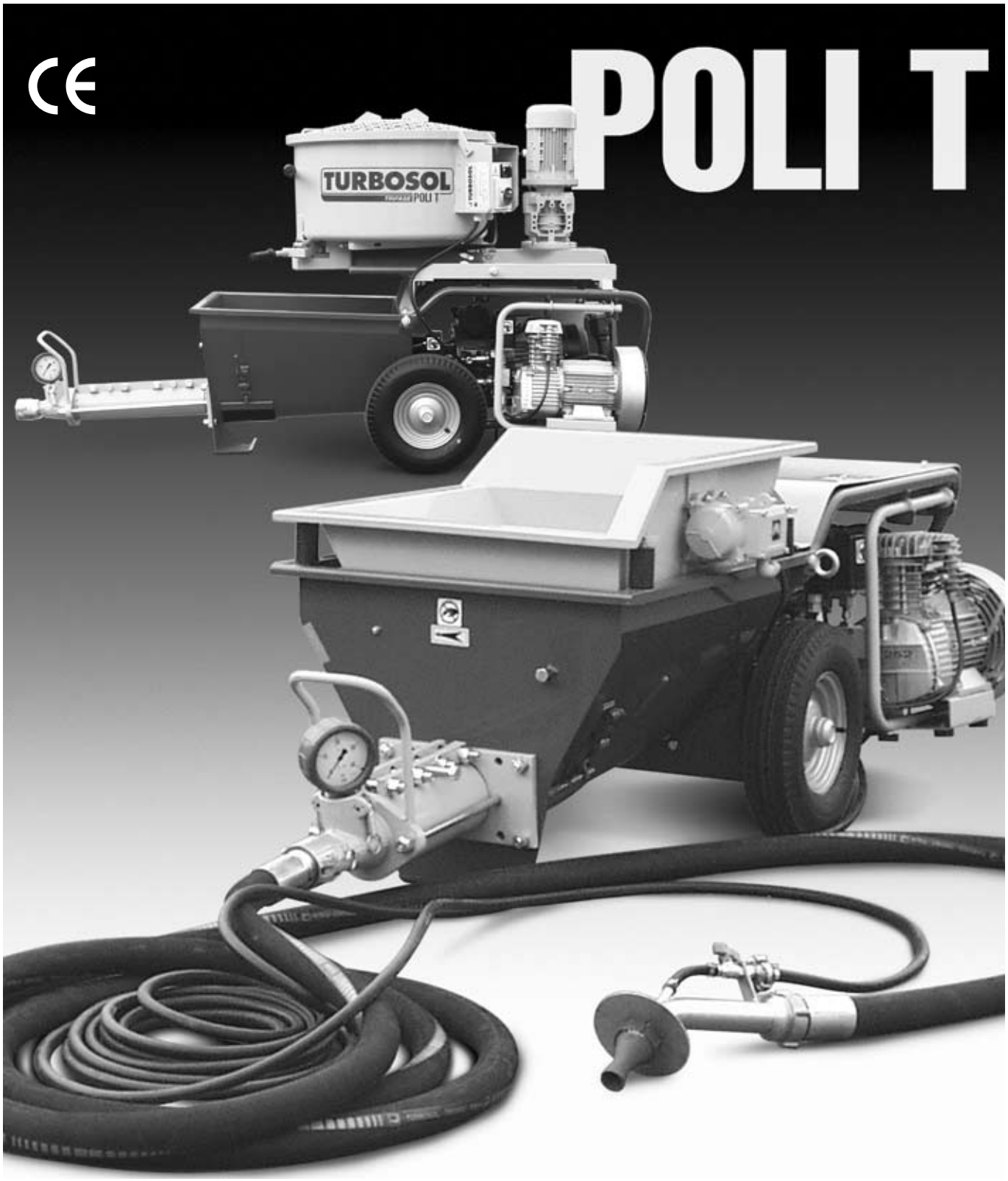
ENGLISH



INSTRUCTIONS FOR USE AND MAINTENANCE
COMPREHENSIVE CATALOGUE & SPARE PARTS

CT. 200.401

Serial number

TURBOSOL
PUMPING SYSTEMS FOR THE BUILDING INDUSTRY

CONTENTS

USE AND MAINTENANCE

SPARE PARTS

ACCESSORIES

WIRING DIAGRAMS

USER GUIDE

IMPORTANT

Read and carefully follow the instructions contained in this booklet. By doing so, you will thus help prevent accidents, be fully covered by the manufacturer's warranty, and have always available an equipment that is perfectly efficient and ready to use.

Operation and maintenance of this equipment must be performed only by skilled personnel who are well aware of the dangers inherent to the machinery itself.

All standards aimed at the prevention of work accidents must be rigorously observed, as must all regulations covering safety on the jobsite.

The manufacturer shall not be liable in any manner whatsoever for injury or damage to persons or things resulting from unauthorized changes in or modification of this equipment.

MIXING, CONVEYING AND SPRAYING MACHINE FOR READY-MIX MORTARS, TRADITIONAL MORTARS AND FINISHING COATS

POLI T

Machine serial number:

You are strongly advised to enter your machine's serial number in the space above which must always be referred in order to facilitate the work of the personnel in charge, and it must likewise be mentioned when requesting service assistance or spare parts.

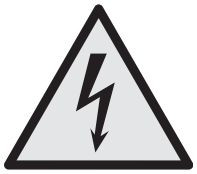
We reserve the right to make any technical modification whatsoever in the interests of improving this machinery, even if such eventual modifications are not referred to in this booklet.

LABELS

DESCRIPTION

This user guide must be read prior to operating the machine

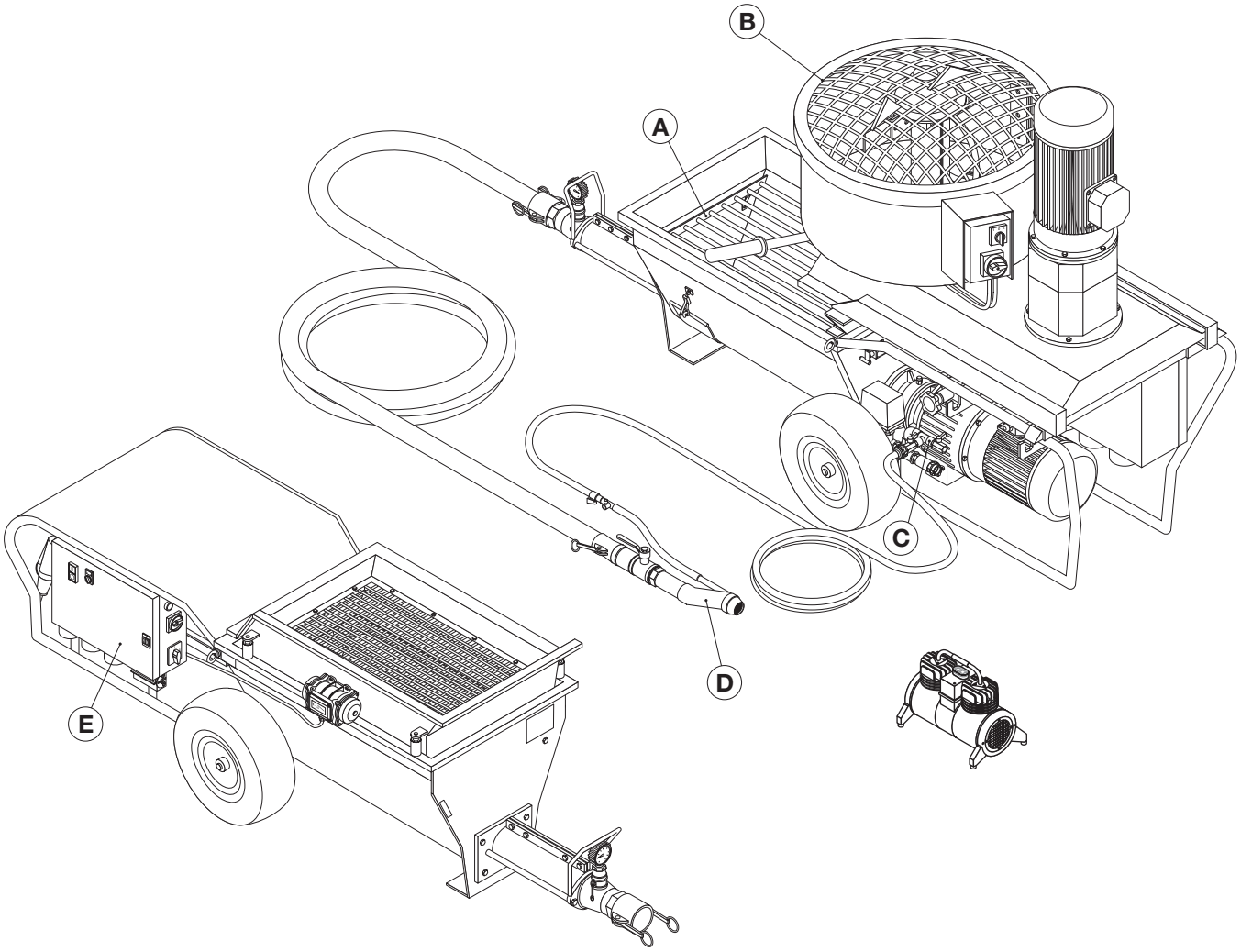
This user guide must be read with regard to routine and extraordinary maintenance



Warning:
Risk of electrical shock

CAUTION!

A - The hopper is fitted with a safety device. Opening the safety grid stops the agitator.
B - The mixer is fitted with a safety device. Opening the safety grid stops the mixer.
C - Ensure that no person is near the air outlets.
D - Never point the spray gun at persons.
E - Electrical components are present that may be live.



1 - GENERAL INFORMATION

1.1 - INTRODUCTION

The POLI T mixing, conveying and spraying machine for ready-mix mortars, traditional mortars and structural mortars may be provided with various accessories and consequently not all the components described in this guide are necessarily mounted on your machine.

We have done our best to illustrate the different versions clearly so that you can easily identify the servicing and maintenance instructions applicable to your machine.

Please read the following instructions carefully before starting your machine and scrupulously comply with them thereafter.

Do not hesitate to contact the TURBOSOL PRODUZIONE S.P.A. customer service department for any further information.

TURBOSOL PRODUZIONE S.P.A.
Via Volta, 1
31030 Pero di Breda di Piave (TV) - ITALIA

Tel. 0039 - 0422 - 90.2.51
Fax 0039 - 0422 - 90.44.08
http://www.turbosol.com
e-mail: info@turbosol.it

1.2 - GENERAL INFORMATION

TURBOSOL machines
Years of experience and continuous development lie behind these machines. Acquired know-how plus high quality standards are essential for manufacturing a long-lasting, extremely reliable machine with low operating costs.

Precautions to be taken with the machine in operation
Maintenance or repairs should only be carried out with the machine at a standstill. Any protective or safety devices that need to be removed in order to carry out work should be remounted upon completion of the same.

Maintenance and care
Maintenance and care are of the utmost importance if the machine is to live up to expectations. It is therefore essential to comply with the recommended maintenance intervals and to meticulously carry out the necessary work.

Safety

This symbol is to be found in this guide beside every reference to safety or correct use of the machine and should be scrupulously observed.
Service personnel should also be informed of the safety regulations. General regulations relating to safety and accident prevention provided for under local laws should likewise be observed.

Training

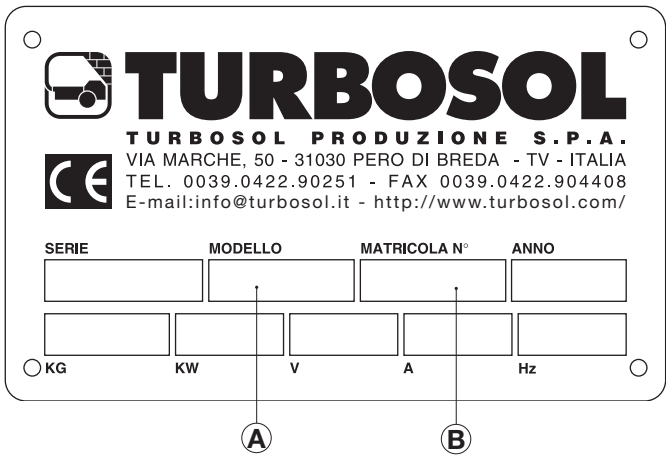
This symbol indicates that the operator should be specifically trained in order to carry out the operation correctly.

TURBOSOL SERVICE
For any trouble with the machine or for spare parts, please contact the TURBOSOL dealer.

2 - DESCRIPTION OF THE MACHINE

2.1 - TYPE OF MACHINE

Manufacturer's registration plate



The type of machine **(A)**, its serial number **(B)**, and data on the machine's operating power are printed on the manufacturer's registration plate.
The meaning of the various symbols used is as follows:

(A) = Type of machine: **POLI T EV (/MP)**

POLI T = *Mixing, conveying and spraying machine for ready-mix mortars, traditional mortars and finishing coats*

EV = *Electrical version with variable-speed drive*

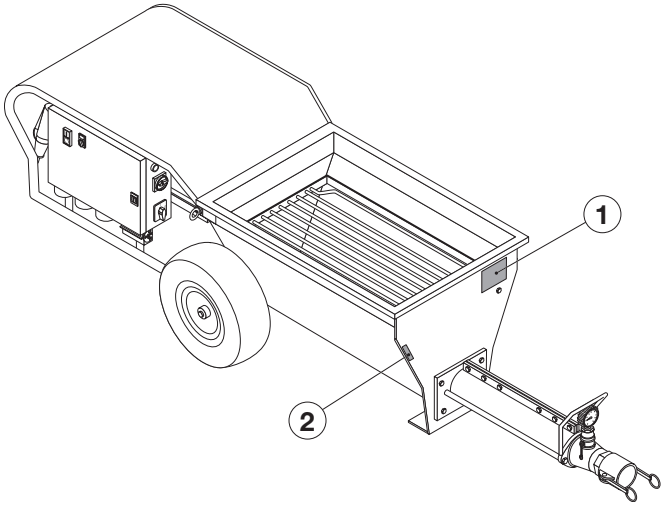
/MP = *With pan mixer*

(B) = Machine serial number: **NNNNN/AA**

NNNNN = *Machine serial number.*

/AA = *The year of manufacture*

Position of the rating plate
The rating plate **(1)** is fixed onto the machine hopper.



Position of the machine serial number
The machine serial number **(2)** is punched onto the hopper as well as on the rating plate.

2.2 - DESCRIPTION OF THE MACHINE

Standard equipment:

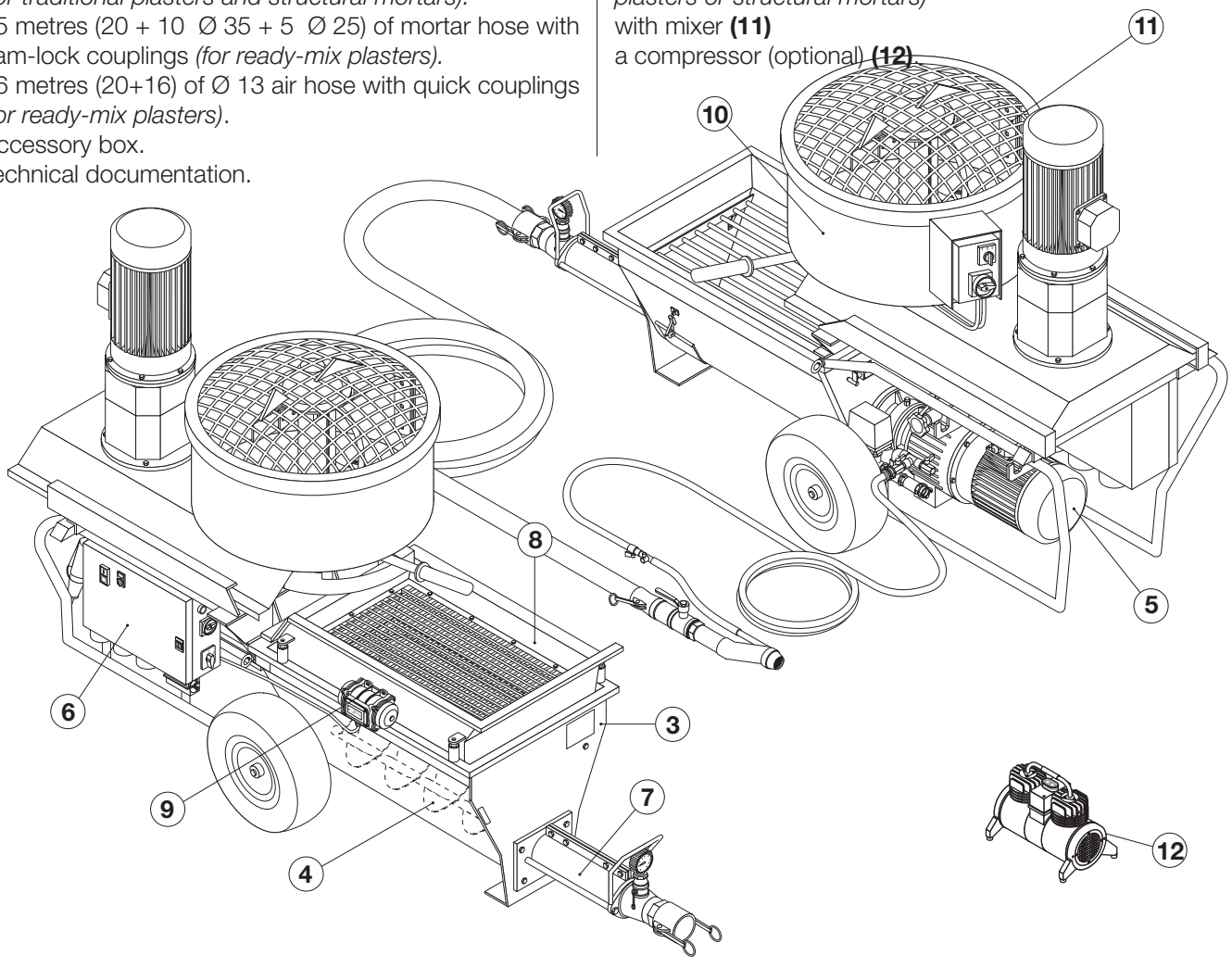
- Unitized body with tyres
- 120-litre hopper with agitator.
- Variable output with mechanical variable-speed drive.
- Electric motor.
- Switchboard to CE standards with sockets and selectors for connecting and using the machine.
- Socket for pan mixer *(/MP)*.
- Remote electric control (with 33 metres of cable) or pneumatic control to be selected from the switchboard.
- Vibrating sieve with Ø 8 mm mesh *(for traditional plasters).*
- 120-litre pan mixer with 1.8 kW motor and reverse *(/MP version for traditional, ready-mix plasters and structural mortars).*
- Screw and stator pump in rubber type T25 *(for traditional plasters).*
- Screw and stator pump in rubber type 2L6 *(for ready-mix plasters and structural mortars).*
- Pump outlet with cam-lock coupling DN 50
- 30 metres (20 + 10) of Ø 35 mortar hose with cam-lock couplings *(for traditional plasters and structural mortars)*.
- 31 metres of Ø 13 air hose with quick couplings *(for traditional plasters and structural mortars).*
- 35 metres (20 + 10 Ø 35 + 5 Ø 25) of mortar hose with cam-lock couplings *(for ready-mix plasters).*
- 36 metres (20+16) of Ø 13 air hose with quick couplings *(for ready-mix plasters)*.
- Accessory box.
- Technical documentation.

Optional:

Complete vibrating sieve.
Device for injection of cemeticious mixer or controlled pressure.
Water gauge.
Mushroom dish for pan mixer with scraper.
Spray gun for thick layer ready-mix plasters.
Spray guns for injection of cementicious slurries, stuccoing and pressure pointing with or without air inject.
Nozzle for pumping mortars.
Screw and stator pump type 60.12
Compressor 250 l/min –1.5 kW - 380 V (incorporable).
Compressor 590 l/min - 3 kW - 380 V for skim coats (separate).

Main components:

The machine basically comprises:
a hopper **(3)** with agitator **(4)**
a gearmotor **(5)**
a switchboard **(6)**
a pumping unit **(7)**
a vibrating sieve **(8)** with vibrator **(9)**, *(for traditional plasters)*;
a pan mixer *(/MP version)* **(10)** *(for traditional or ready-mix plasters or structural mortars)*
with mixer **(11)**
a compressor (optional) **(12)**.



2.3 - MACHINE SIZE

The overall size and gross weight (ready to operate) of the machine are given below.

Version POLI T EV

LENGTH	WIDTH	HEGHT	WEIGHT
1.850 mm	**710 mm**	**650 mm**	**205 kg**

Version POLI T EV/MP (pan mixer)

LENGTH	WIDTH	HEGHT	WEIGHT
1.850 mm	**710 mm**	**1.210 mm**	**295 kg**

2.4 - TECHNICAL DATA

Machine pressure switch setting	minimum	2 bar
	maximum	4 bar
Compressor pressure switch setting	minimum	3 bar
	maximum	5 bar
Compressor relief valve calibration		7 bar
Air supplied by built-in compressor	at 2 bar	250 l/m'
Supply voltage		400 VAC ±10%
Supply frequency		50 Hz
Auxiliary circuit voltage		24 VAC
Short-circuit current	maximum	6 KA
Number of starts per hour	maximum	24
MACHINE		
Machine electric motor power		5,5 kW
Motor rated current		12,2 A
BUILT-IN COMPRESSOR		
Electric motor power		0,8 kW
Rated current		2,2 A
OVERSIZE MIXER		
Electric motor power		1,85 kW
Rated current		4,36 A
Reducer gear oil change **(SHELL OMALA 220 - 2,8 l)**		**every 3.000 hours**
Variable-speed drive oil change **(SHELL A.T.F. DEXTRON III - 1,0 l)**		**every 3.000 hours**
Compressor oil change **(TURBO DIESEL 15W40 - 0,6 l)**		**every 3.000 hours**
Oversize mixer reduction gear oil change **(AGIP DELIUM VSF 320 - 0,7 l)**		**every 3.000 hours**
Hopper capacity		120 l
Mixer capacity		120 l
Working environment temperature		from -5° to + 35° C
LwA guaranteed (90% confidence level, directive 2000/14/CE), tested by ISET, Notified Body No. 0865		77 dB(A)

N.B.: # **the operator must wear personal ear protection** which guarantees a sound reduction of at least 10 dB(A).

PUMPS	2L6 (standard)	T25 (optional)	60.12 (optional)
Material theoretical output°	0 ÷ 45 l/m'	0 ÷ 45 l/m'	0 ÷ 150 l/m'
Maximum pump pressure	45 bar	25 bar	20 bar
Maximum pumpable particle size	4 ÷ 6 mm	8 ÷ 10 mm	8 ÷ 10 mm
Delivery height (approx.)*	50 - 60 m	30 - 40 m	40 - 50 m
Delivery distance (approx.)*	80 - 100 m	60 - 80 m	80 - 100
Material delivery rubber hose **	Ø 35 x 49 mm Ø 25 x 37 mm	Ø 35 x 49 mm	Ø 50 x 66 mm

N.B.: ° The output may vary according to the viscosity, quality and composition of the mix, pump wear, mortar hose diameter and length, pumping height.

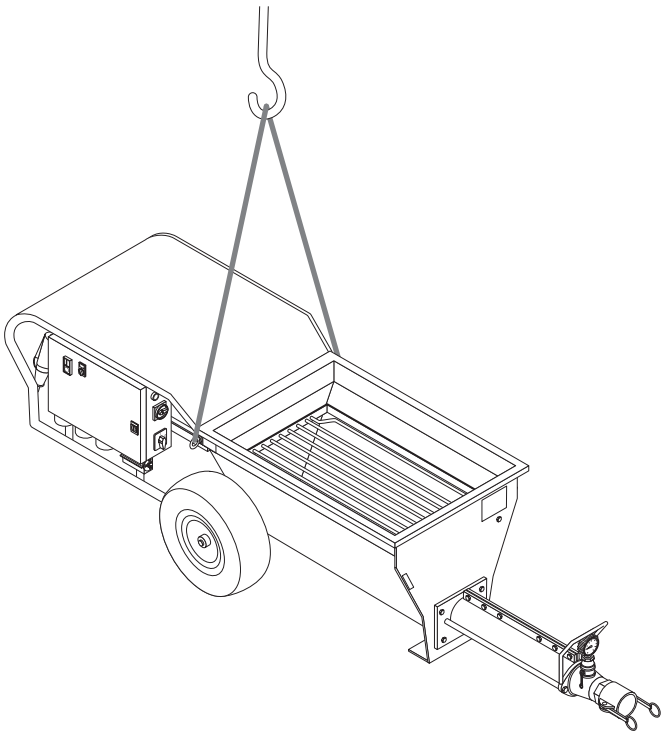
* maximum distance and height not reachable at the same time.
These data are not absolute, but depend on the quality of the materials to be pumped, their consistency, pump capacity and diameter of the used hoses.

** only use hoses made specifically for this machine.

3 - TRANSPORTATION

3.1 - TRANSPORTATION

Attach the ropes to the relative eyebolts located on the sides of the machine.



Do not lift the machine using a lift truck.

Use: one hook and two ropes that have been tested and approved for lifting 500 kg.

Before lifting the machine, ensure that no person is near it.

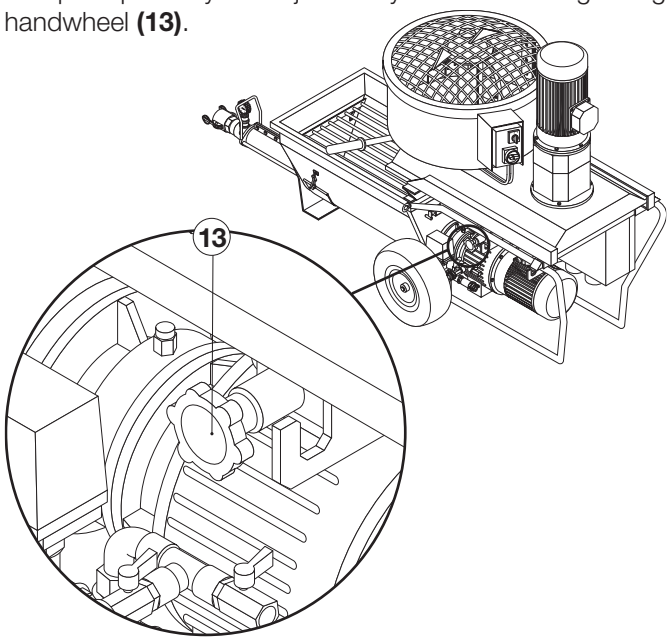
4 - USING THE MACHINE

4.1 – OPERATING PRINCIPLE

POLI T basically consists of a hopper with built-in agitator, which receives the mixed material, and a screw pump for pumping the material. It may be fitted with a pan mixer *(/MP version)* for preparing the mix.

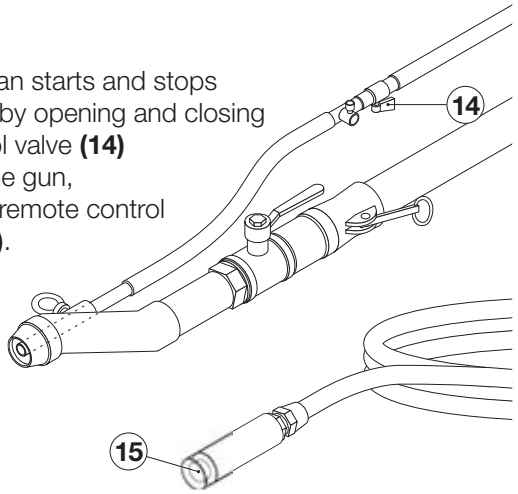
The mix is unloaded into the hopper then pumped by the screw pump to the place of application; the material is conveyed through a hose to the spray gun (which may differ according to the types of materials used), where air coming from the auxiliary compressor is introduced to propel the mix.

Pump output may be adjusted by means of a regulating handwheel **(13)**.



The output should only be adjusted with the motor running, otherwise the variable-speed drive could be broken.

The nozzleman starts and stops the machine by opening and closing the air control valve **(14)** located on the gun, or through a remote control via cable **(15)**.

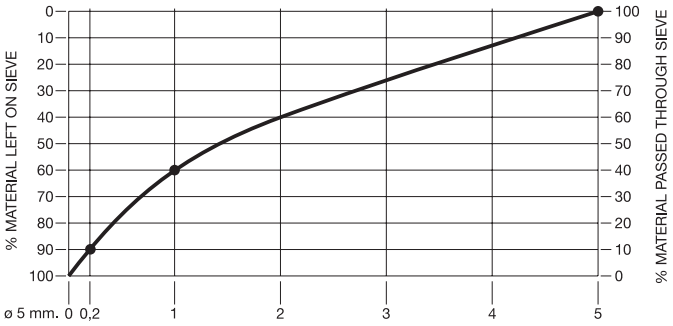


A water gauge may be installed for batching the water and a vibrating sieve for sieving the material.

4.2 - PUMPABLE MATERIALS

Several basic concepts are given below regarding the preparation of traditional mixes that may be conveyed with POLI T:

- the aggregates must be within the granulometry curve:



for example, use aggregates that have
particle size: 1/3 between 0 and 1 mm inclusive
1/3 between 1 and 3 mm inclusive
1/3 between 3 and 5 mm inclusive.

- for a batch of 140 litres, 50 kg (one bag) of cement or plasticized lime are normally used.
- the water/cement ratio should be approx. 0.6: i.e. 25 - 35 litres of water for a batch of 140 litres, depending on the quantity of cement and the moisture content of the aggregates.
- when using ready-mix mortars (mortars with controlled shrinkage, normal or light cement-based ready mixes), the instructions provided by the producer of the material must be carefully followed, in particular with regard to the quantity of water and the mixing time.

Applications

POLI T mixes, pumps, sprays and injects various types of materials such as:

- Traditional mortars and plasters.
- Ready-mix mortars and plasters.
- Thermal-acoustic insulating mortars and plasters.
- Mortars and plasters for finishing coats, smoothed or rusticated decorative skim coats.
- Mortars and plasters for thin-layer coats.
- Plasters for filling and pressure pointing joints and gaps.
- Substrates for lightweight and self-levelling screeds.
- Masonry mortars and adhesive mortars for blocks and plasterboard.
- Mortars and cementitious slurries for consolidation grouting.
- Special fibre-reinforced cement mortars and slurries for structural repair.
- Fire-retardant coatings.
- Cementitious grouts and slurries,
  (it is advisable to use the mushroom dish for pan mixer with scraper).
- Refractory and wearproof mortars.
- Heavy mortars for filling moulds, special containers and ballast.
- Intumescent plasters.

Choice of pump

Three different types of pumps are available, each one particularly indicated for a certain type of material:

STANDARD CONFIGURATION:

- Pump 2L6 (screw code 250.123, stator code 263.184) for ready-mixed materials with particle size 4 ÷ 6 mm (grit);
- Pump T25 (screw code 250.089, stator code 238.030) for traditional mortars with particle size 8 ÷ 10 mm.

OPTIONAL:

- Pump 60.12 (screw code 250.136, stator code 263.366) for self-levelling screeds.

Choice of spray gun

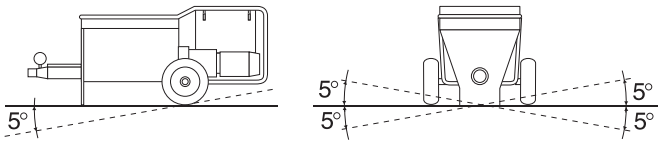
The specific gun is used according to the material:

- Gun *(code 216.246)* for traditional and controlled-shrinkage mortars (accessory box code 201.112).
- Gun *(code 216.252)* for ready-mixed plasters and structural mortars (accessory box code 201.067).
- Gun *(code 216.266)* for skim coats, plastics, waterproofing (accessory box code 201.071).
- Nozzle Ø 50 *(code 251.193)* for self-levelling substrates (accessory box code 201.089).
- Gun *(code 216.251)* for thick coat application ready-mix plasters (optional).
- Gun *(code 216.256)* for filling gaps (optional).
- Gun *(code 216.496)* for joints (optional).
- Gun *(code 216.299)* for injections (optional – injection device).
- Nozzle Ø 25 *(code 216.255)*
  Ø 35 *(code 216.216)* for pumping mortars and self-levelling screeds (optional).

4.3 - PRELIMINARY OPERATIONS

Machine position

Place the machine as level as possible: the maximum allowed gradient is 5° both lengthwise and crosswise.



The machine should be positioned on site where the radius of action of the hoses may be best exploited.

Wedge the wheels.

Prepare all the material for cleaning the machine (water hose, washing sponges, etc.)

⚠ *Leave at least 80 cm free space all round the machine and ensure that the ground in the working area has no holes or hazardous protuberances.*

Electrical connection

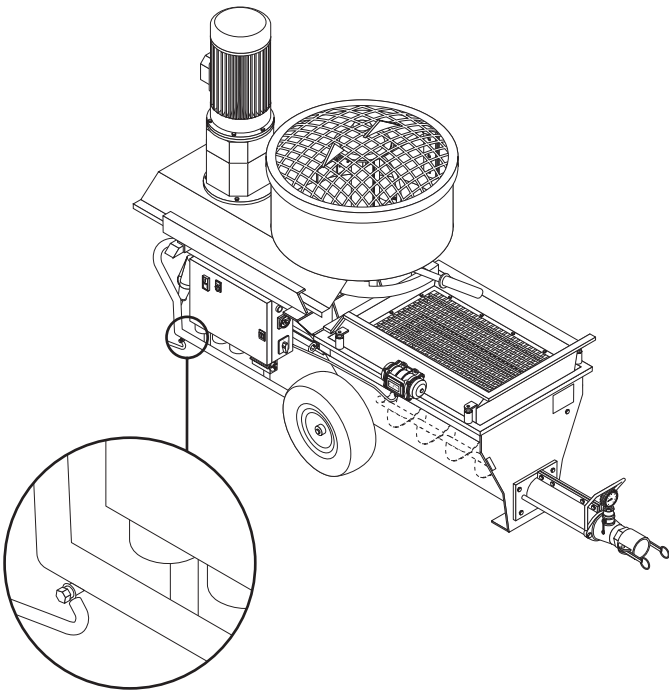
Connect the machine to the site switchboard using a neoprene (wearproof rubber) cable marked H07 RN-F and having a minimum section:

4 x 4 mm for distances up to 20 m
4 x 6 mm for distances up to 50 m
4 x 10 mm for distances up to 100 m.

⚠ *Using an electric cable with an unsuitable section jeopardises machine operation.*

The site switchboard should have:
- a minimum power of 12 kVA
- adequate earthing
- 35 A fuses (type Am)
- high-sensitivity differentials (30 mA)
- and in any case be in compliance with current regulations in the country where the machine is being used.

Connect the earth terminal of the machine to the site switchboard earth stake by means of a cable having a minimum section that is never less than 16 mm².



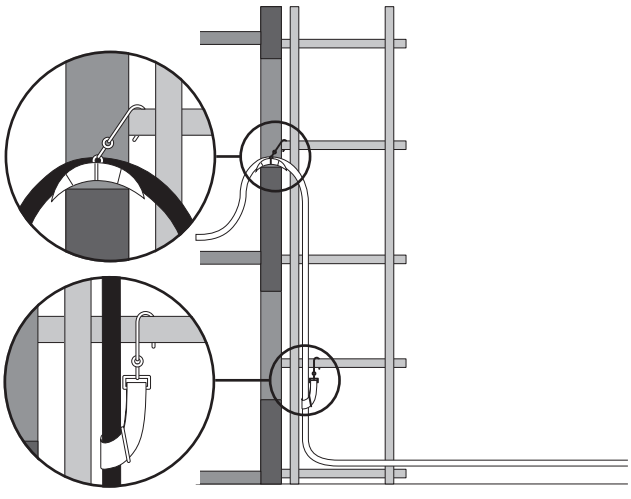
⚠ *If the machine is powered through a generating set, use a 30 kVA set.*

Hoses
Lay out the hoses, limiting their length as much as possible (to reduce wear), at the same time checking that they are in good condition.

During pumping the first 10 m of hose swing back and forth a few centimetres: it is best to keep this section of hose raised from the ground and in any case do not let it rest on sharp edges or abrasive elements to prevent early wear of the actual hoses.

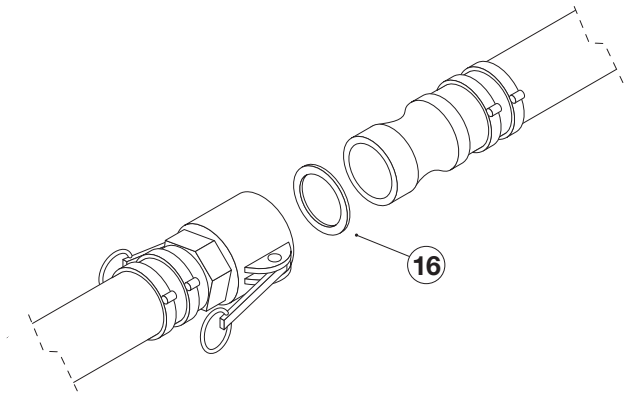
⚠ *Only use original hoses and couplings.*
The hoses should be fitted by TURBOSOL PRODUZIONE S.p.A. or by firms expressly authorised by the same.
Under no circumstances shall TURBOSOL PRODUZIONE S.p.A. be liable for injury to persons or damage to property if other than original hoses or couplings have been used.

Hose anchorage
The hose line should be suitably anchored: use the provided hose safety straps for anchoring the vertical sections and if necessary the special hose support upon arrival at the floor level (optional - code 234.049 + 266.148 + 266.103 / two pieces).

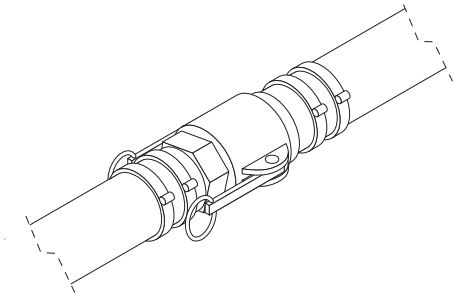


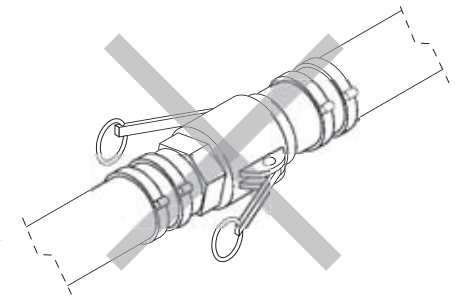
Couplings
Check that the couplings are clean and in good working order.

- **<u>Cam-lock couplings</u>**
  When connecting the hose parts, check that the rubber gasket **(16)** is present,



fully close the levers.

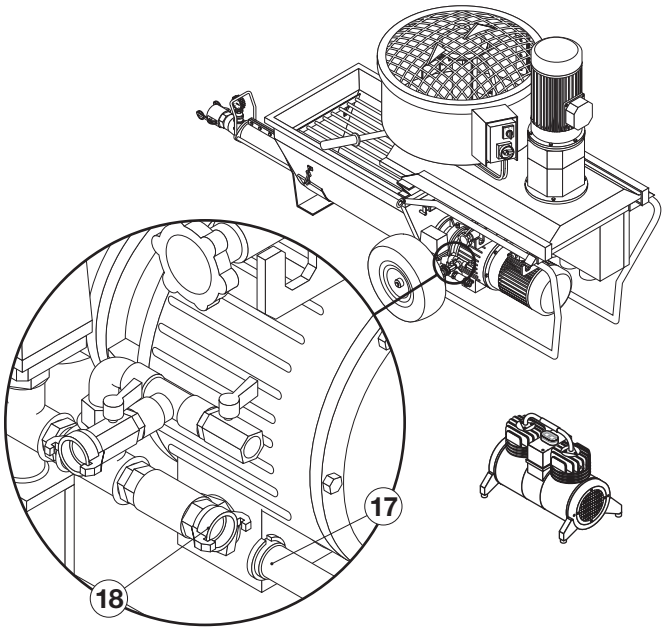




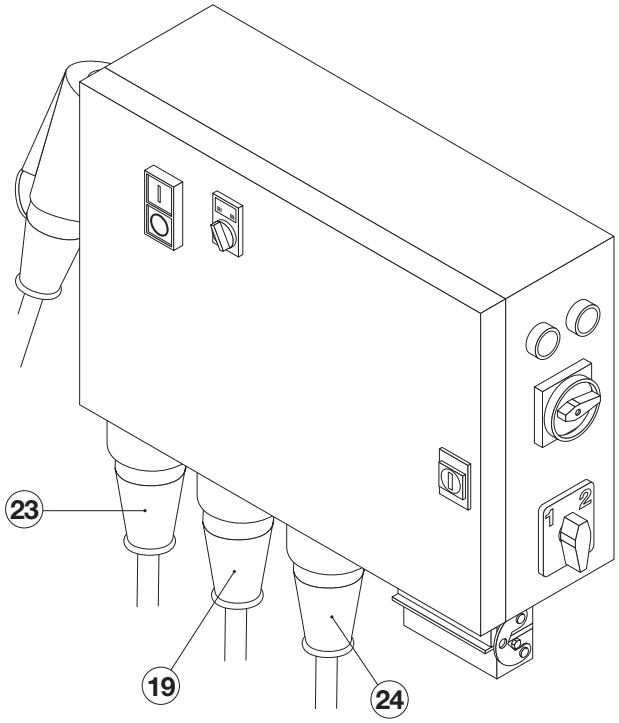
Hoses Ø 35 x 49 - length 10 or 20 metres
for maximum pumpable particle size of 0 ÷ 10 mm.

Connections

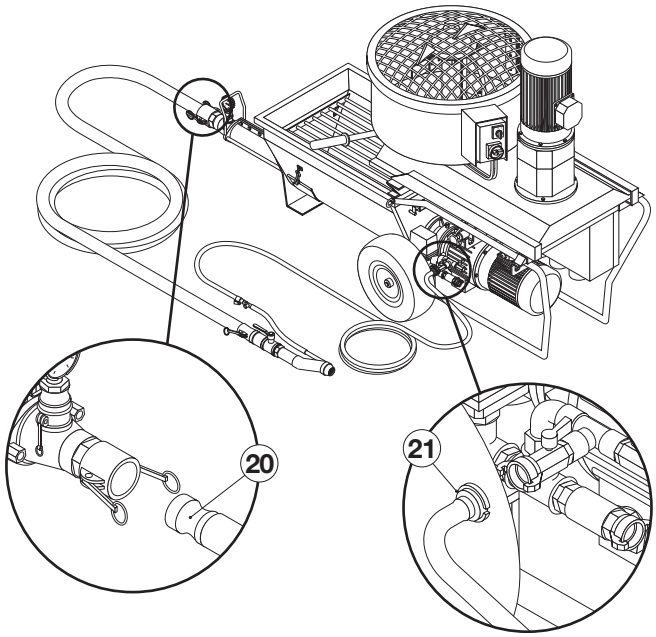
Connect the compressor air supply hose **(17)** to the machine air supply hose **(18)**.



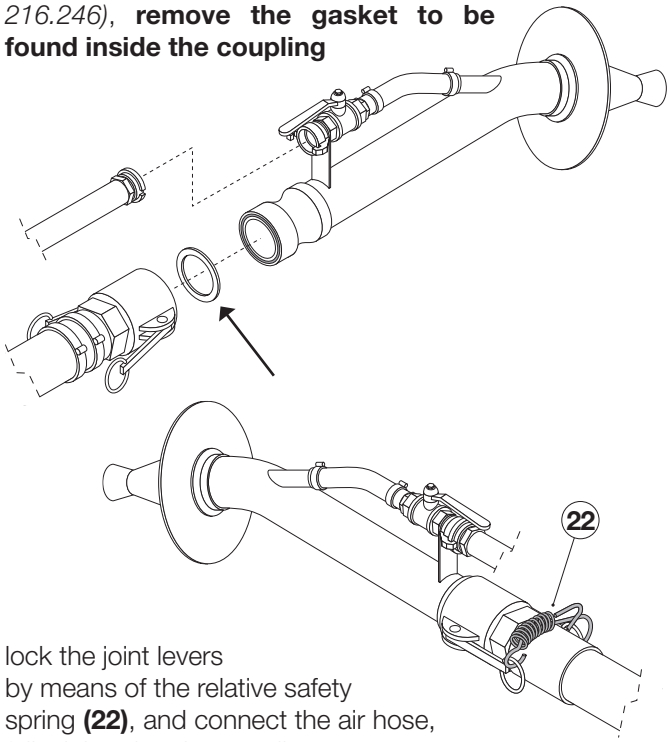
Carry out the electrical connections of the compressor to the machine switchboard **(19)**.



Connect the material hose **(20)** to the screw pump and the air hose to the machine air unit outlet connection **(21)**.



Then connect the spray gun to the end of the material hose; when using the gun for traditional mortars *(code 216.246)*, **remove the gasket to be found inside the coupling**



lock the joint levers by means of the relative safety spring **(22)**, and connect the air hose, fully tightening the couplings.

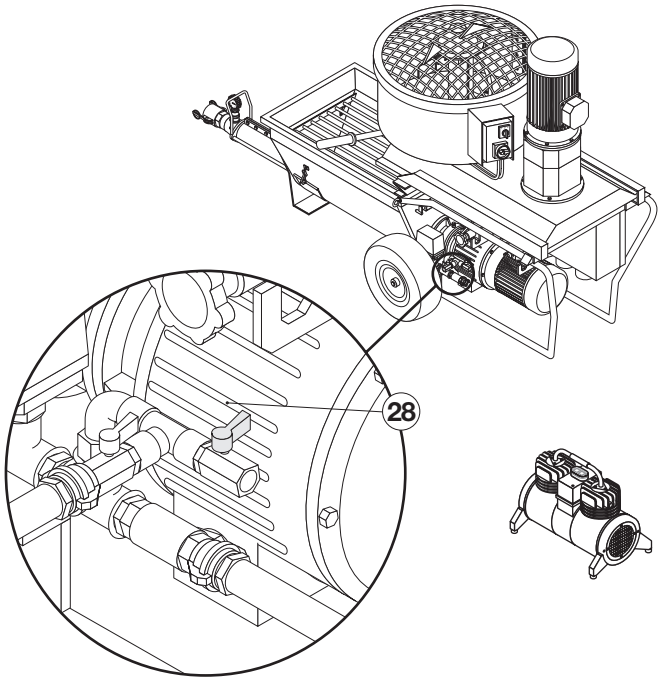
In the version with pan mixer (/MP), connect the socket to the machine switchboard **(23)**.

In the version with vibrating sieve, connect the socket to the machine switchboard **(24)**.

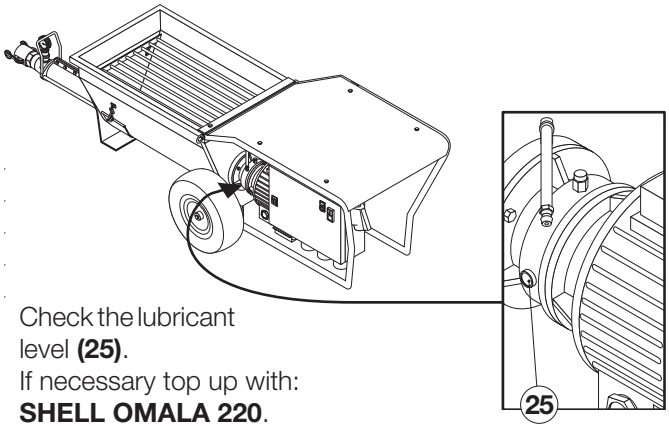
4.4 - STARTING

Preventive checks
Carry out the following checks:

- Check that all the service valves **(28)** are closed.

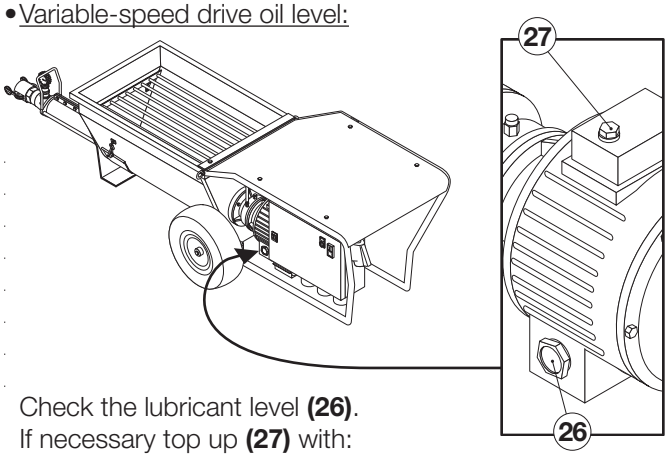


- Reduction gear oil level:



Check the lubricant level **(25)**.
If necessary top up with:
SHELL OMALA 220.

- Variable-speed drive oil level:



Check the lubricant level **(26)**.
If necessary top up **(27)** with:
SHELL A.T.F. DEXTRON III.

⚠ *Upon completion of any repair or maintenance work, ensure that all the protective devices (fan casing, hopper grid and mixer grid) have been replaced and that no tool has been left inside the hopper or the mixer.*

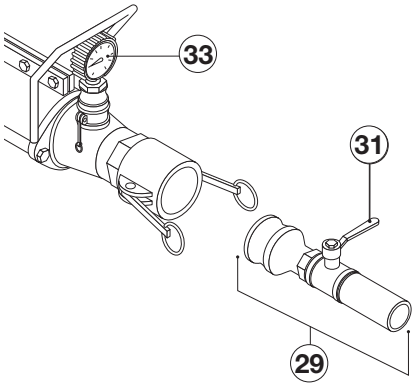
⚠ *Make sure that the protective grids are on the mixer and the hopper and are properly fixed.*

⚠ *Before starting the machine, ensure that only authorised persons are in the vicinity, that is, at less than 1 metre from the machine.*

- **Calibrating the pump**

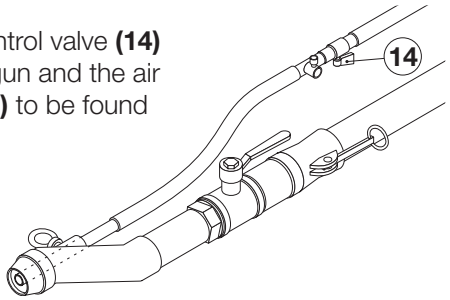
If a new pump has been installed and in any case every day prior to commencing work with the material, it is advisable to check pump calibration as follows:

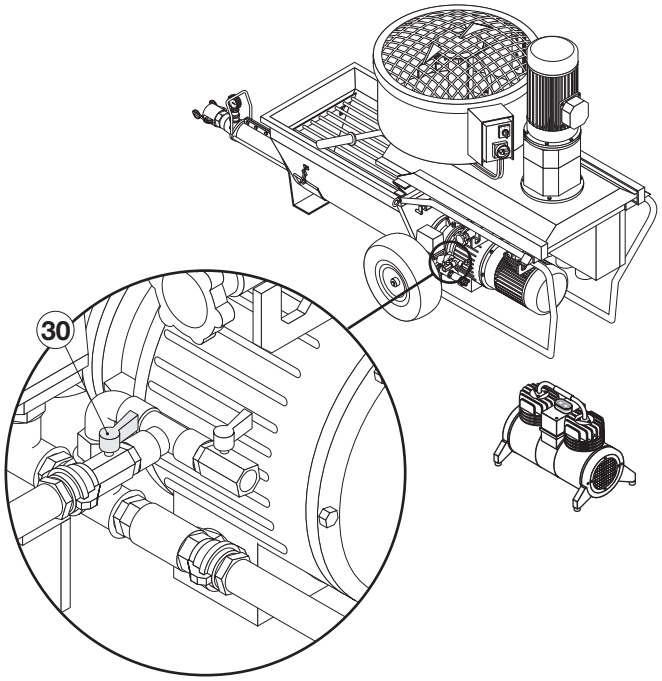
- Mount the pump calibrating unit **(29)**, with the shutoff valve open.



- Fill the hopper with water.

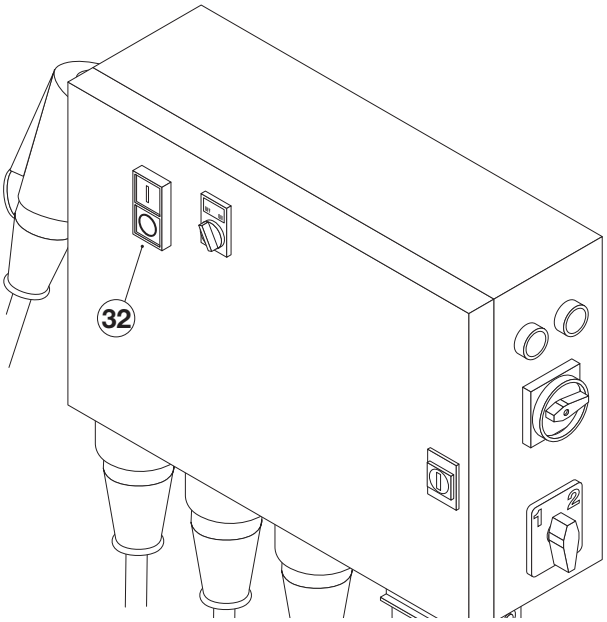
- Open the air control valve **(14)** located on the gun and the air supply valve **(30)** to be found on the machine.





- Close the shutoff valve **(31)** of the pump calibrating unit.

- Start the mortar pump by pressing the relative start/stop button **I/0 (32)**.



- Read the pumping pressure shown on the pressure gauge installed on the mortar delivery header **(33).**

⚠ *The values should be approximately those given in the table.*

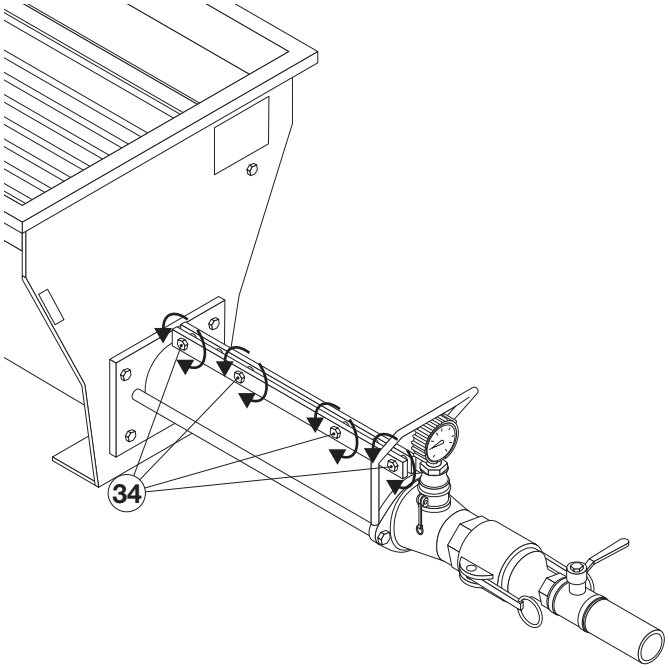
- After a few seconds (approx. 10 seconds), stop the pump: the pump holding pressure can be read on the pressure gauge and should be equivalent to approx. half the pumping pressure measured previously.

CORRECT PRESSURE VALUES (approximate)

PUMP	HOSE LENGTHS UP TO		
	40 m	50 m	60 m
2L6*	10 bar	15 bar	20 bar
60.12*	8 bar	10 bar	12 bar
T25**	10 bar	15 bar	----

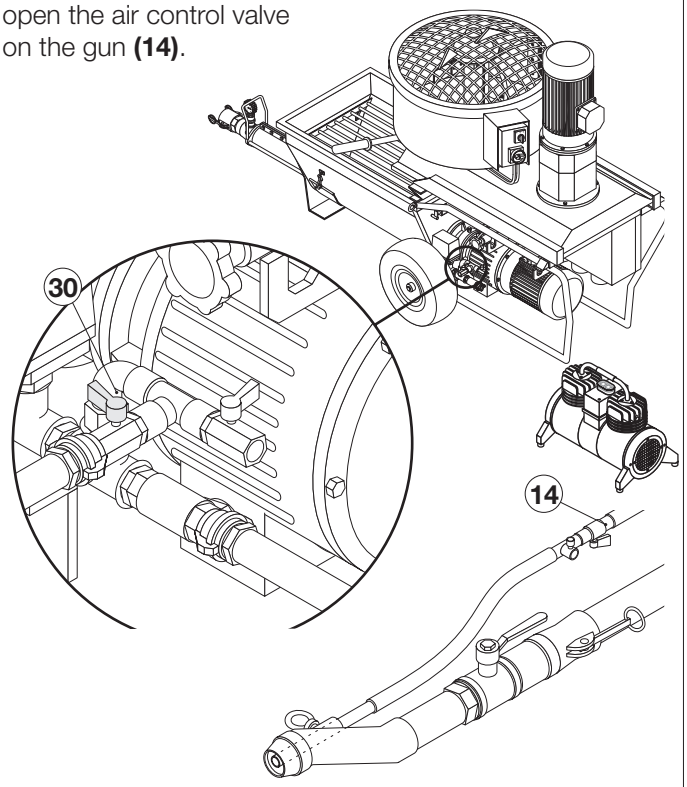
* pumps **2L6** and **60.12** calibration values.
** pump **T25** pumping pressure value.

If the measured calibration pressure values are different from the correct ones given in the table, use the bolts on the pump clamp **(34) to** adjust as follows
- tighten: the calibration pressure increases
- loosen: the calibration pressure decreases.



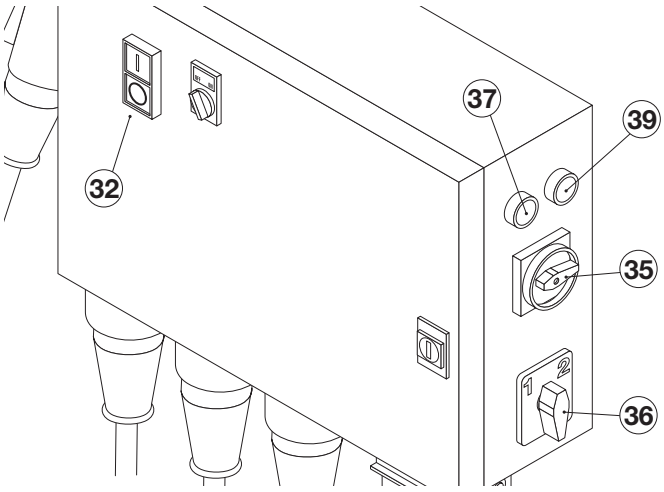
Repeat the calibration operation until the correct pressure values are obtained.
Now remove the pump calibrating unit **(29)** and connect the material delivery hose.
Should it prove impossible to calibrate the pump unit, the stator and if necessary the screw must be replaced.

Starting
Close the air supply valve **(30)** located on the machine and open the air control valve on the gun **(14)**.



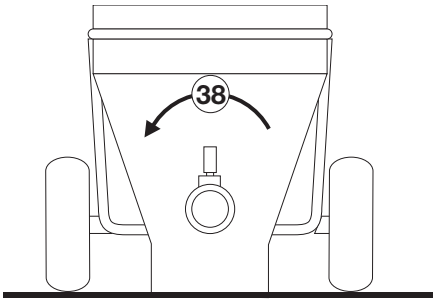
Fill the hopper with water to prevent the screw from working dry.

Put the on/off switch **(35)** to the position **I** and the reversing gear **(36)** to position **1** or **2**.
The white indicator light **(37)** indicating power comes on.



Start the mortar pump by pressing the start/stop button **I/0 (32)**.

The pump starts to turn; check the correct direction of rotation of the screw **(38)** and if necessary invert the position of the reversing gear **(36)**.



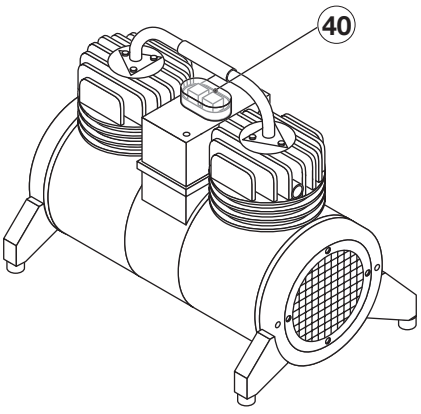
⚠ *The red indicator light* **(39)** *comes on when the hopper safety grid is open. The agitator stops when the red indicator light is on.*
The red indicator light also comes on should the overload cutout trip.

Check that the safety grid is in proper working order: upon lifting it, pumping stops and the red indicator light **(39)** on the switchboard comes on.
To start the machine again, press the start/stop button **(32)**. With the mortar pump in operation, adjust the pump output.

⚠ **The output may only be adjusted with the pump in operation, otherwise the variable-speed drive could be seriously damaged.**

⚠ **When reversing the pump direction of rotation due to plugging of the hoses, first stop the pan mixer (/MP version).**

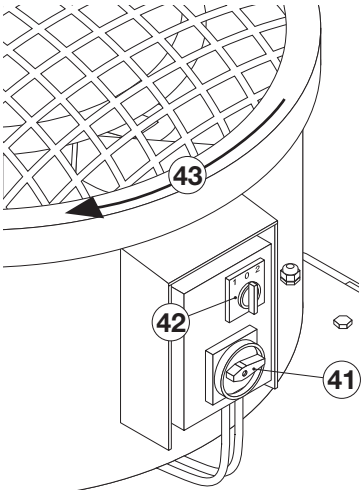
Start the compressor by pressing the green button **(40)** located on the pressure switch.



Check correct operation of the whole assembly.

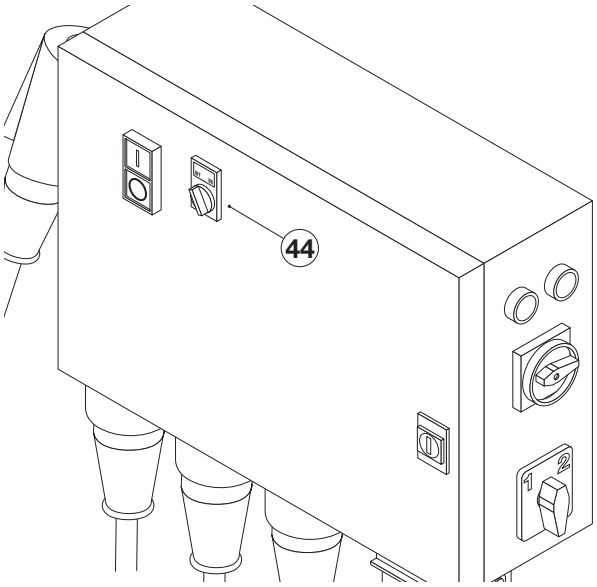
Pan mixer control (/MP version)
In the version with pan mixer, start the mixer and load the materials.

Put the on/off switch **(41)** to position **I** and then the reversing gear **(42)** to position **1** or **2**.
The correct direction of rotation of the mixer shaft is shown in the figure **(43)**.



⚠ *With the mixer in operation, check that the safety microswitch is working properly: upon lifting the grid, the mixer shaft should stop. To start the mixer again, first put the on/off switch* **(41)** *to position* **0** *and then to position* **1**.

In the version with vibrating sieve, activate the electric vibrator by putting the selector **(44)** to the position **ON**.



⚠ *Check that the protective grids on the mixer and the hopper are in proper working order: it should be impossible to raise them more than 30 mm without the mixer and the agitator stopping.*

⚠ *During these tests, check that there is always water in the hopper: the screw must never turn without water, otherwise it deteriorates very fast.*

⚠ *Use nitrile gloves to protect against cuts and scratches; preferably use models with CE 940072 certification.*

Preparing the batch

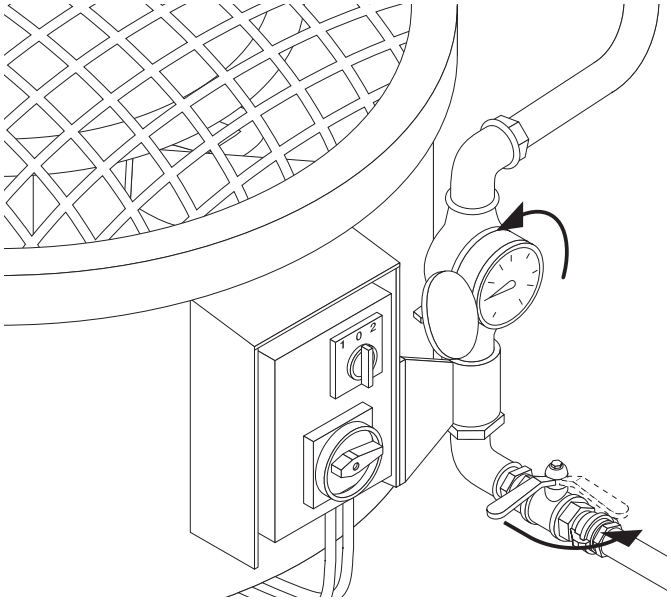
The mix should be plastic and within the grading curve, as shown in point 4.2.

The pan mixer *(/MP version)* may be used to prepare the batch.

When preparing mixes for traditional plasters, pour water into the mixer; add 50% of the aggregate (sand), then 100% of the binder (cement) and lastly the remaining 50% of the aggregate; add more water if necessary.
With traditional mortars it is advisable to use the vibrating sieve to prevent the pump from being damaged by stones or encrustation of material.

When preparing ready-mixed batches, follow the material supplier's instructions.

For correct batching of the water, a water gauge is available (optional), which indicates the quantity of water put into the mixer.



- Turn the water gauge so that the indicator is on position **0**.
- Put water into the mixer, turning the lever in the direction indicated in the drawing.
- Close the valve, by positioning the lever at right angles to the actual valve, when the litre-counter indicator has reached the required quantity.

Prior to each new batch, put the water gauge indicator to **0** to facilitate operations.

Conveying and spraying the mix

Drain the residual water of the pump calibration operation from the hopper by opening the hatch located on the bottom of the hopper.

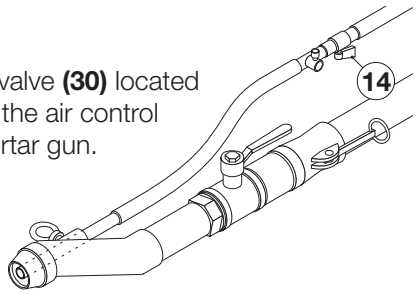
Use nitrile gloves to protect against cuts and scratches; preferably use models with CE 940072 certification.

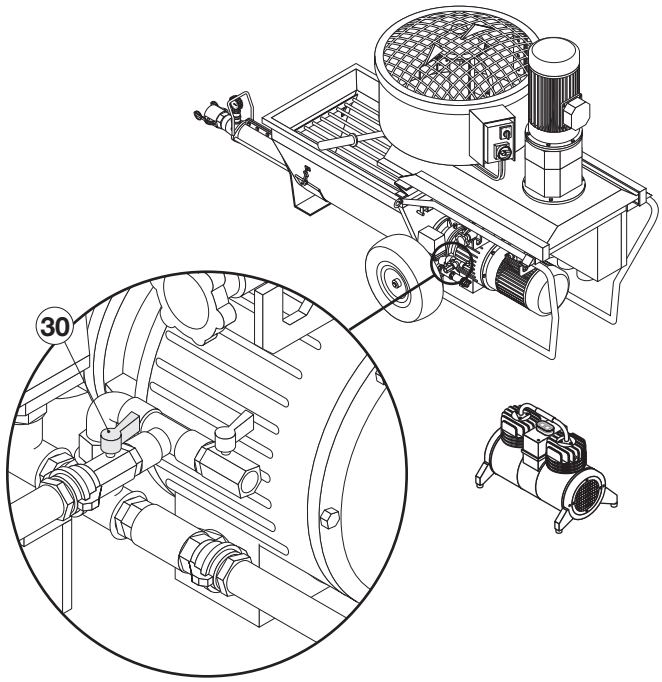
During work use goggles, preferably with shockproof polycarbonate lens, to protect the eyes.

Pour two or three bucketfuls (30 l) of slurry (50% water, 50% cement or lime) into the hopper.

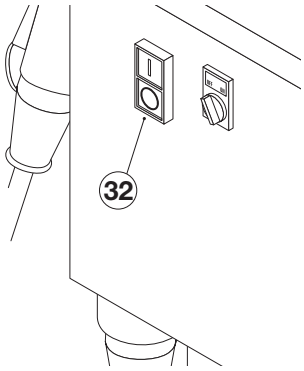
If there is no slurry available but only ready-mix materials, make them slightly more fluid than normal.

- Open the air supply valve **(30)** located on the machine and the air control valve **(14)** on the mortar gun.

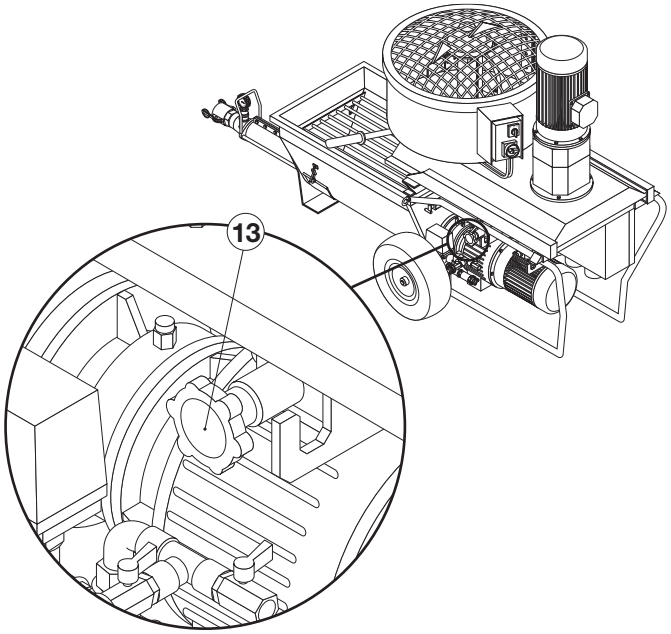




- Start the mortar pump using the start/stop button **I/0 (32)**: the pump starts pumping the slurry previously poured into the hopper.



Adjust the pump output to the required value using the variable-speed drive handwheel **(13)**.



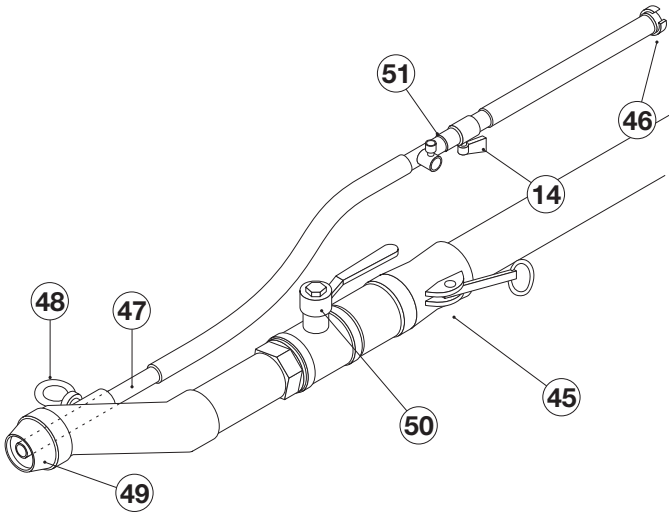
When the slurry previously poured into the hopper has been pumped out, stop the machine by closing the air control valve **(14)** on the gun.

- Pour the mix into the hopper.
- Start the machine by opening the air control valve **(14)** on the gun.

When no more slurry but just mortar comes out the gun, start working normally.
The machine remote control is activated by opening and closing the air control valve **(14)** on the gun.

Various types of gun are available for spraying materials (see page 11).

Each gun comprises:
- a coupling to the material delivery hose **(45)**
- a coupling to the air hose **(46)**
- a control valve on the air hose **(14)**
- an air nozzle **(47)**
  with or without possibility of regulation **(48)**
- a spray tip **(49)**
- possibly a material
  shutoff valve **(50)**
- and a relief valve for excess air **(51)**.

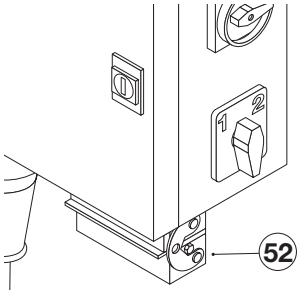


By way of general information, using nozzles and spray tips with a smaller diameter results in a wider spraying rose of the material and vice versa.

If ready-mixed materials are used, the vibrating sieve is unnecessary.

A start/stop cable remote control is available as an alternative to the pneumatic remote control.

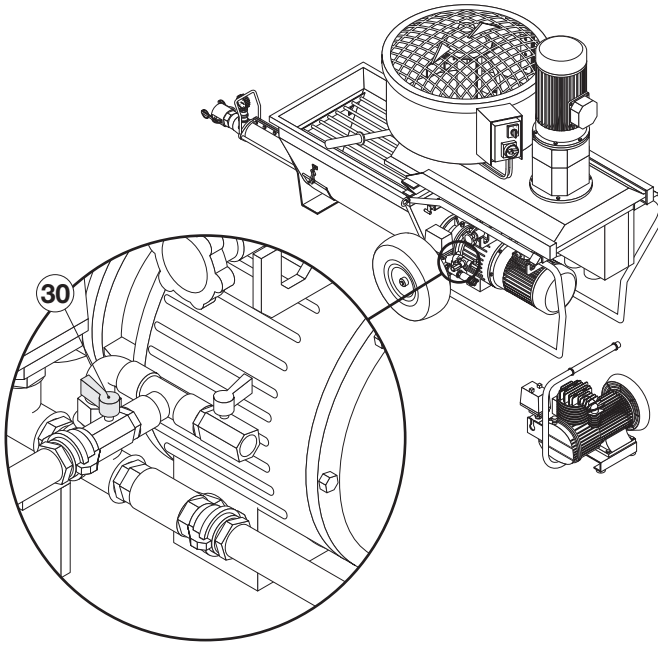
To operate with the cable remote control, it must be connected to the connector **(52)** located below the control panel.

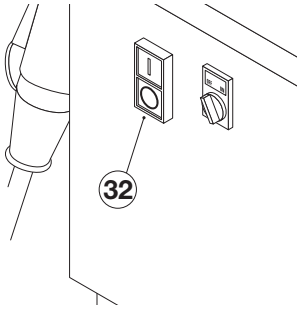


⚠ *During work, periodically check the pumping pressure shown by the pressure gauge* **(33)** *located on the pump outlet header.*

4.5 - CLEAN-UP AT END OF WORK

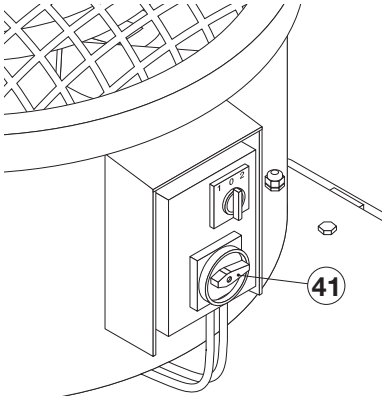
Having pumped out the last batch (better if slightly wetter than usual), when the agitator screw begins to be visible, stop the pump by closing the air supply valve **(30)**.





Stop the mortar pump using the start/stop button **I/0 (32)**

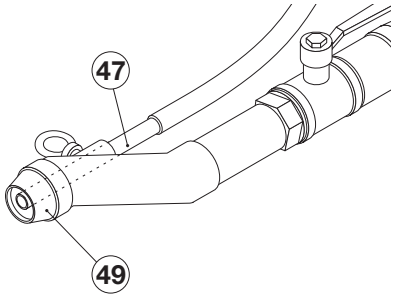
and the oversize pan mixer by putting the on/off switch to **0 (41)**.



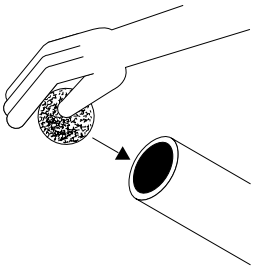
Before loosening any joint on the material delivery hose or disconnecting the spray gun, ensure that the pressure gauge shows a pressure of 0 (zero) bar and that there is no residual pressure in the hoses.

The operator should have been specifically trained to carry out this operation.
Before opening a coupling in particular, ensure that there is no residual pressure in the hoses and that no other persons are in the vicinity.
This potentially hazardous operation should always be carried out by an expert person exercising the utmost caution.

Remove the spray gun and wash it thoroughly, dismantling the spray tip **(49)**.
Check that the nozzle hole **(47)** is clear (clean it if necessary).



Disconnect the hoses from the mortar pump and insert a cleaning sponge into the end of the hose.



Open the hopper hatch.
Using a water jet, thoroughly clean the mixer first and then the hopper.

Close the hopper discharge hatch and fill the hopper with water.
Start the pump and continue until only clear water is discharged. Stop the pump.

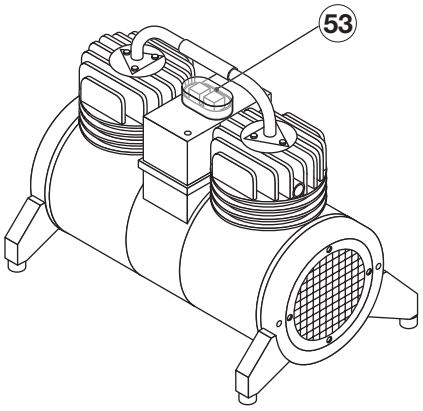
Connect the hose to the pump again. Start the machine and pump water until the cleaning sponge comes out.
If the sponge does not bring out the material from the hoses with it, this means that the pressure exerted by the pump on the water is insufficient.

The tightness of the clamp being equal, the pump exerts a considerably higher pressure on the material than on the water. Tighten the clamp until an adequate pressure is obtained.
At the end put the clamp back to the previous normal working position.
Should the hose still not be clean, repeat the operation.

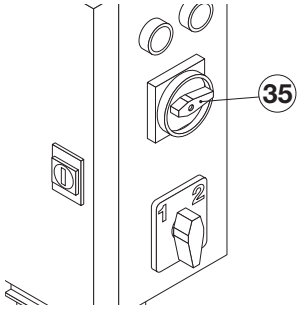
⚠ *Never direct the water jet towards the switchboard or the electric motors when washing the machine.*

⚠ *Never direct the water jet at persons.*
Use suitable protective gear, in particular for the hands and eyes.

Before stopping the machine:
- Stop the mortar pump using the start/stop button **I/0 (32)**, the pan mixer by putting the on/off switch to **0 (41)** and the compressor using button **(53)**.



Now switch off the machine using the on/off switch **(35)** located on the control panel.



⚠ *Should an **EMERGENCY STOP** be necessary, put the red on/off switch with yellow background **(35)**, located on the machine control panel, to **0**.*

⚠ **To avoid overloading and the consequent early wear of the pumping equipment, stop the machine with the variator flywheel in the centre position WHEN YOU HAVE FINISHED WORKING. (In this way, when the machine is started the next time, the variator has a higher torque and the risk of slippage is therefore reduced).**

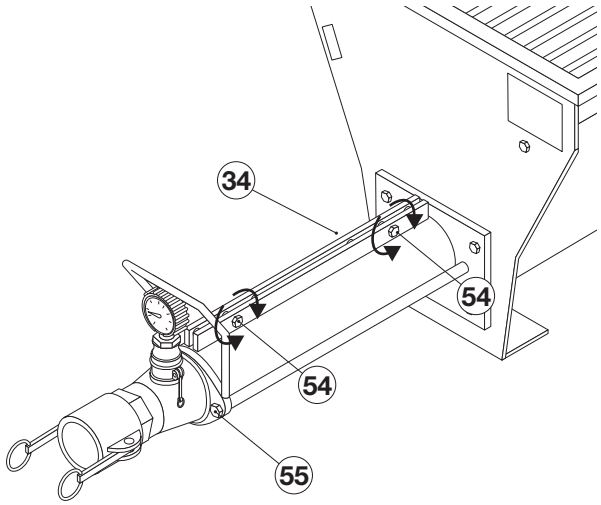
4.6 - REPLACING THE PUMPING UNIT

To replace the pumping unit proceed as follows:

First of all stop the pump and then cut off the power supply to the control panel.

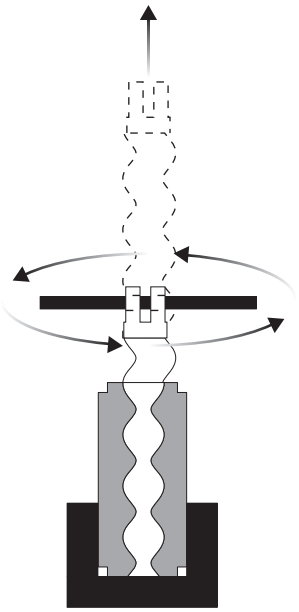
The operator should have been specifically trained to carry out this operation.
Before opening a coupling in particular, ensure that there is no residual pressure in the hoses and that no other persons are in the vicinity.
This potentially hazardous operation should always be carried out by an expert person exercising the utmost caution.

- Raise the hopper protective grid.
- Remove the bolt fixing the screw to the agitator impeller.
- Fully loosen the adjusting screws **(34)** of the clamp and then widen it using the relative screws **(54)**.



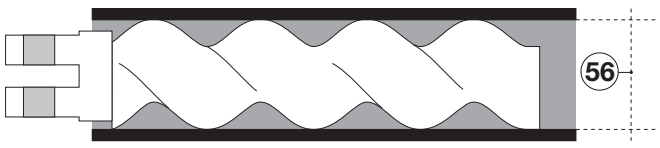
Remove the material delivery header, loosening the retaining nuts of the stay rods **(55)**.

Take the stator-screw unit, clamp it, lock the stator and using a suitable ø 12 mm rod of suitable length (80 cm) inserted into the hole made for the bolt to fix the screw to the universal joint of the impeller (or to the impeller), loosen the screw until it can be removed.



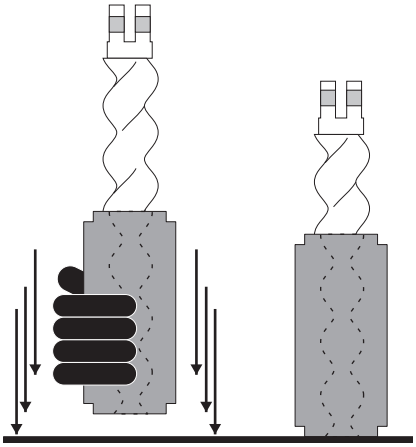
Check if the screw is still useable (the diameter should be no more than 3 mm less than the original value) and if it is not use a new screw as well as a new stator.

This check is carried out by resting the screw on a horizontal surface and checking that the distance of the impeller tips from the surface is not less than **(56)**:
- 59 mm for screw 2L6
- 71 mm for screw T25
- 78 mm for screw 60.12.

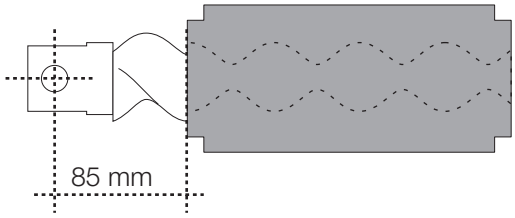


To mount the unit, grease both the screw and the stator well with Vaseline or grease for tyres (under no circumstances use mineral oils or greases, otherwise the chamber would be irreparably damaged!). Following the procedure used for dismantling but in the reverse order, mount the screw onto the stator and fully tighten.
The stator should be mounted with the more flared side facing the hopper.

If assembly is impossible with this procedure, take the unit with the screw partially inserted, lift it and repeatedly hit it on the ground.



Check that the distance between the hole centre of the bolt fixing the screw to the universal joint of the impeller (or to the impeller) and the edge of the chamber is approx. 85 mm.



- Mount the clamp.
- Mount the material delivery header and fix it firmly with the two stay rods.
- Release and close the hopper protective grid.
- Start the motor.

Calibrate the pump unit as described on page 16.

5 - MACHINE MAINTENANCE

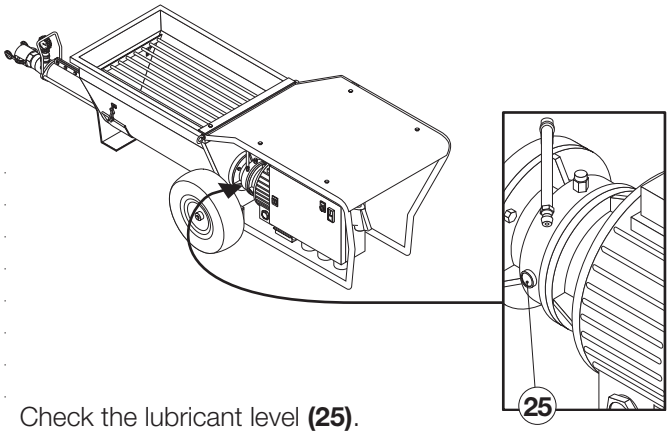
5.1 - TO BE PERFORMED BY THE OPERATOR

Essential information for correct maintenance of the machine is given below. More detailed information relating to maintenance of the compressor is given in the respective operating and maintenance booklet, which the machine operator should ready carefully as well as this guide before starting work.

Daily operations

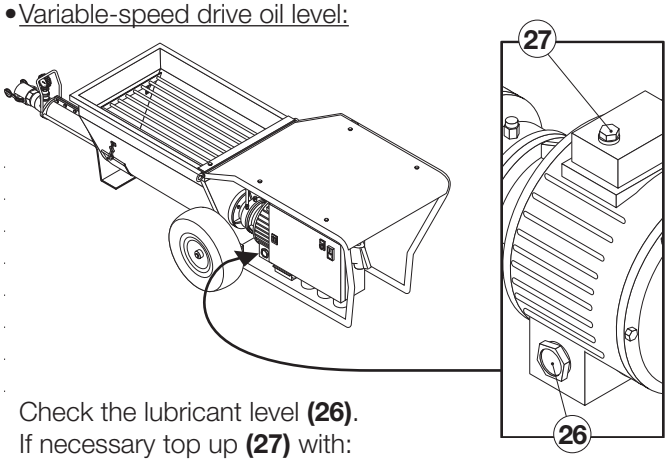
At the beginning of work

• Reducer ear oil level:



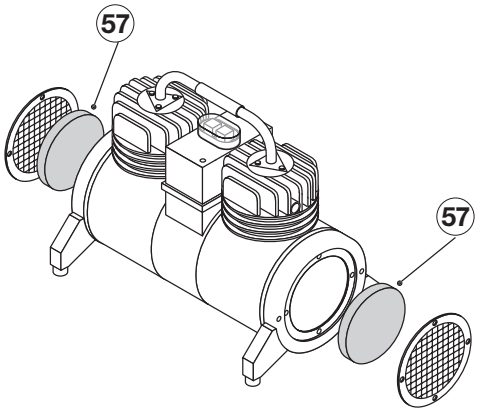
Check the lubricant level **(25)**.
If necessary top up with:
SHELL OMALA 220.

• Variable-speed drive oil level:



Check the lubricant level **(26)**.
If necessary top up **(27)** with:
SHELL A.T.F. DEXTRON III.

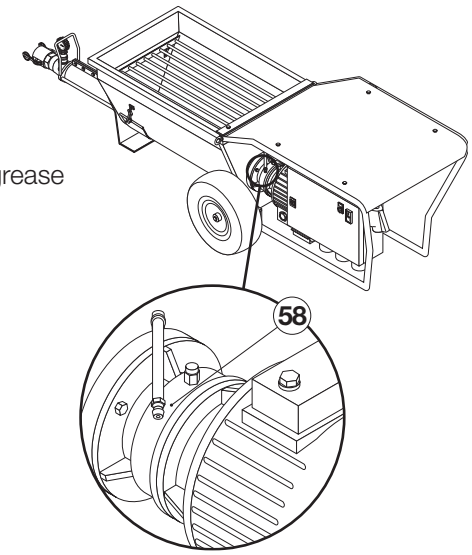
• Check that
the compressor air
filter **(57)**
is clean.



Check that the air and material hoses are intact, paying particular attention to the couplings.

At the end of work

- With the machine in operation, grease the agitator bearing **(58)** using the grease gun provided.



To ensure correct greasing, the grease should come out of the sealing pans.
Should you forget to carry out this operation, the seals and bearings will be irreparably damaged in a very short time (days).

- Spray the hopper and the mixer with demoulding liquid.

The operator should ensure that scheduled maintenance by qualified personnel is carried out as described below.

The manufacturer is relieved of all liability for any consequences due to failure to comply with the maintenance schedule or for maintenance carried out by the operator that is the responsibility of qualified personnel.

Operations to be carried out after the first 50 hours
- Change the oil in the compressor.

Operations to be carried out after the first 300 hours
- Change the oil in the variable-speed drive.
- Change the oil in the reducer gear.
- Change the oil in the reduction gear of the oversize pan mixer *(synthetic oil: AGIP DELIUM VSF 320)*.

Operations to be carried out once every 6 months or every 500 hours
- Check the oil level of the machine variable-speed drive and of the reducer gear.
- Check the oil level in the reducer gear of the oversize pan mixer.
- General check of the machine.
- Check of the safety devices.
- Check the efficiency of the pressure gauge that indicates the pressure of the material.
- Check the efficiency of the switchboard.
- Check the hopper seals for leaks.
- Check the calibrations of the machine pneumatic system.
- Check the air hoses.
- Check the material hoses.

Operations to be carried out once a year or every 1.000 hours
- Change the compressor oil.

Operations to be carried out once every 3.000 hours
- Change the oil in the machine reducer gear and variable-speed drive.
- Change the oil in the reduction gear of the oversize pan mixer *(synthetic oil: AGIP DELIUM VSF 320)*.

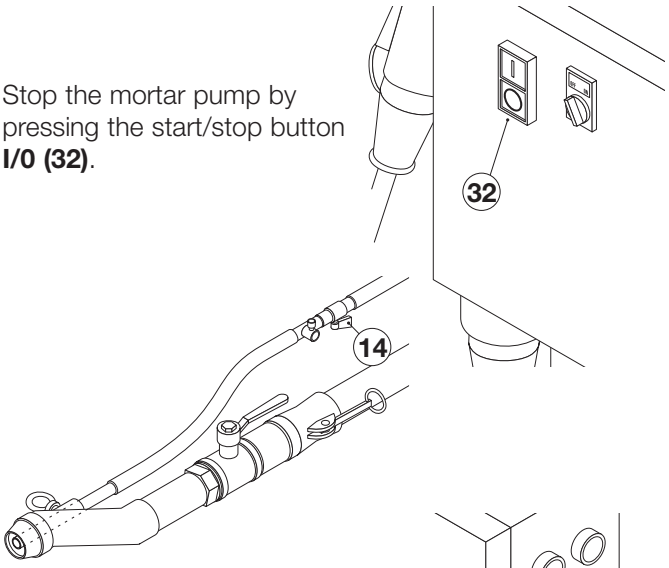
6 - TROUBLESHOOTING

6.1 - NO MATERIAL COMES OUT THE SPRAY GUN

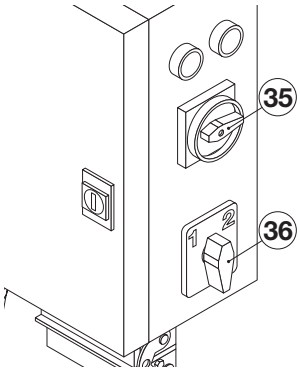
Material hose plugged
An incorrect mix or delays in application can result in a plugged material delivery hose: no material comes out the spray gun and the mortar hose pressure gauge shows a higher than normal working pressure.

"Normal working pressure" depends on the material and the hoses used: it is advisable to check this pressure value regularly on the mortar hose pressure gauge so that any abnormality may be promptly identified.

Stop the mortar pump by pressing the start/stop button **I/0 (32)**.



Relieve the pressure in the material delivery hoses by making the pump turn in the reverse direction for a few seconds: open the gun air control valve **(14)** and reverse the pump direction of rotation by means of the relative command **(36)**.



Try to restart.

Keep the working pressure under control and immediately stop the machine if the pressure exceeds the normal value, because this indicates that there could still be a plug.
Close the gun air control valve **(14)** and relieve the pressure in the material delivery hoses by making the pump turn in the reverse direction **(36)** for a few seconds.

Always relieve the pressure in the hoses by making the pump turn in the reverse direction for a few seconds (5 ÷ 10), before disconnecting them. The pressure gauge indicating the mortar hose pressure should show a pressure of 0 bar.

The operator or nozzleman should have been specifically trained to carry out this operation.
Before opening a coupling in particular, ensure that there is no residual pressure in the hoses and that no other persons are in the vicinity.
This potentially hazardous operation should always be carried out by an expert person exercising the utmost caution.

Stop the pump.

Identify where the material delivery hose line is plugged: the hose is hard and rigid in this part.
The most critical points are around the couplings.

Disconnect the plugged hose, hit it with a hammer at the edge of the blockage in order to break the plug that has formed and allow the hardened material to come out.

Start the pump for a few moments and ensure that the hose is free of the plug: the material should flow out freely.

Pour slurry into the hose downstream of the one which was plugged, reconnect the hose line and restart.
If the material contained in the hopper cannot be pumped, the hopper should be emptied.

Stop the mortar pump by pressing the start/stop button **I/0 (32)**, open the hopper grid and use a trowel to empty the hopper

Open the hopper discharge hatch and use a water jet to flush out all the material. Close the hatch, replace and fix the hopper protective grid, make a correct mix and restart.

6.2 - OTHER PROBLEMS

Clogged spray gun
Encrusted hardened material, a stone or a spray tip with too small a passage for the material being used could cause a blockage in the spray gun.
Relieve the pressure in the hoses by reversing the pump direction of rotation for a few moments.

Always relieve the pressure in the hoses by making the pump turn in the reverse direction for a few seconds (5 ÷ 10), before disconnecting the spray gun. The pressure gauge indicating the mortar hose pressure should show a pressure of 0 bar.

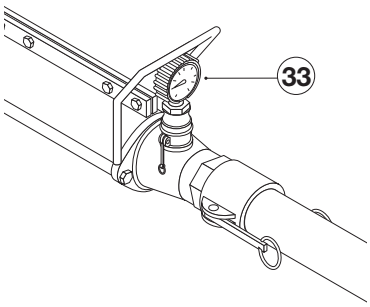
Stop the pump **(32)** and, for greater safety, switch off the machine **(35)**.

The operator should have been specifically trained to carry out this operation.
Before opening a coupling in particular, ensure that there is no residual pressure in the hoses and that no other persons are in the vicinity.
This potentially hazardous operation should always be carried out by an expert person exercising the utmost caution.

Disassemble the spray tip and if necessary the gun and remove the cause of clogging.
Before reassembling the spray tip or the spray gun, ensure that the nozzle is clear (if necessary clean it) and that material flows freely from the hose.

Incorrect stator adjustment
An incorrectly adjusted stator can result in no material flowing out of the spray gun or even plugging up at the beginning of the hose due to overheating of the material.

In these cases the pressure shown by the mortar hose pressure gauge **(33)** is at the working value.
The stator must be adjusted (page 17).



If material tends to drip from the spray gun during operation, use a spray tip or nozzle with a smaller hole.

If material flows from the spray gun intermittently during operation, first check that there is material in the hopper and then check if the machine is starting and stopping without reason, that is, without any external intervention.
In this latter case, check for bends or kinks in the air hose and for clogging of the air nozzle.

6.3 - WORK BY THE OPERATOR

PROBLEMS	CAUSES	REMEDIES
The pump overload cutout trips (red indicator light on the switchboard comes on)	Clamp too tight.	• Loosen clamp.
	Working pressure too high.	• Change the mix or reduce hose length or use hoses with larger diameter.
	Incorrect supply voltage.	• Have the line voltage checked (page 12). If necessary obtain an independent generating set with minimum capacity of: 25 kVA (version without mixer) or 30 kVA (version with mixer)
No material comes out of the spray gun.	Plugged hose.	• Incorrect mix, change the mix. • Delays in applications; shorten pause times. • Incorrectly adjusted stator; adjust.
	Encrusted material or pebble obstructing the passage.	• Clean the spray tip and, if necessary, the gun.
	Spray tip hole too small.	• Replace the spray tip.
	Incorrectly adjusted stator.	• Adjust the stator.
Material tends to drip from the spray gun during operation.	Spray tip or nozzle hole too large.	• Replace with a spray tip or nozzle having a smaller hole.
Material flows from the spray gun intermittently during operation.	Bent air hose or clogged air nozzle.	• Check the air hose and the nozzle for obstructions.

6.4 - WORK BY QUALIFIED PERSONNEL

For any other problems, please contact the authorised after-sales service centre.

7 - RESPONSIBILITY OF THE OPERATOR

The **PERSON IN CHARGE** of the machinery is responsible for assuring that whoever operates such machinery is well aware of the instructions contained in this use and maintenance manual, and in particular that said operator has received special training in the proper execution of those operations marked in the manual by the following symbol:  .

The warranty offered by the manufacturer becomes null and void if this machinery is not used in accordance with the instructions in this manual. In addition, this manual must always accompany the machine.
The machine's operator must be thoroughly taught and trained in regard to the operation and use of the machine itself and must sign this use and maintenance manual on the line reading "read and approved". If this procedure is not complied with, the operator is prohibited from using this machine.

Signature of the **PERSON IN CHARGE**

read and approved _____

read and approved _____

read and approved _____

Signature of the **OPERATOR**

read and approved _____

read and approved _____

read and approved _____