USER AND MAINTENANCE MANUAL



MIXING AND GROUTING UNIT

MINIGROUT II

WARNING

This manual has been drawn up in compliance with the requirements of Machinery directive 2006/42/EC and Standards UNI EN ISO 12100 (point 6.4.5)

The instructions relating to use and maintenance contained in this manual have been laid down in the form of written text, signs, symbols, charts and figures, in order to provide the user with all the necessary information for a correct and safe use of the machine. For this purpose, explanation have been included regarding transport, handling, installation, adjustment and use, training of technical personnel, accident prevention, maintenance interventions and spare parts ordering; furthermore, prominence has been given to information intended for all those who must work with the machine under safe conditions, so as to safeguard their health and reduce accident risk to a minimum. The technical features and description of the machine have also been included.

It is indispensable to read this manual before machine use. All the machine devices must be maintained in a good condition to avoid dangers for a machine operator. The manual shows how to use and maintain the machine and the operator is obliged to read and follow it.

The instruction manual cannot, in any way, substitute the user's experience and skill.

ATTENTION

ALL THE INFORMATION GIVEN HERE CONCERNS YOUR SAFETY. STORE THIS MANUAL IN A SAFE PLACE AND CONSULT IT WHEN NEEDED. THE MACHINE SHOULD BE USED ONLY FOR WHAT IT WAS INTENDED, ANY OTHER USE IS FORBIDDEN. THE COMPANY DECLINES ANY CIVIL OR PENAL RESPONSIBILITY FOR ANY ACCIDENTS CAUSED BY MACHINE MODIFICATIONS MADE BY NON-QUALIFIED STAFF AFTER THE MACHINE DELIVERY. THE MACHINE MUST BE USED ONLY BY PEOPLE TRAINED IN ITS USE.

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1
GENERAL INFORMATION

1.1. The subject of the manual

The manual contains all the necessary information to correctly install, regulate, use and maintain the machine. The instructions concern the equipment:

MINIGROUT II –

For this reason, the user is encouraged to:

- train the staff to use the machine
- enable the staff to read it at work when needed
- hand over the manual to next owners

ITALSWISS Engineering S.r.l. declines any responsibility for the machine use, different than indicated in this manual.

Remarks:

All the elements shown in the photos (buttons, parts etc.) are in parenthesis and indicate a number or a photo in which are presented.



WARNING!

Indicates the danger for one's health or for the machine



ATTENTION!
Indicates danger of machine damage

Photos remark:
The machine may be presented without protective casings and devices in order to show more clearly all its parts. The photos are general. The machine may be different from the one shown in the photos but the operations to be carried out remain the same.

1.2. Use limits

All the machine use stages (installation, adjustment, use, maintenance, removal etc.) must be carried out by qualified staff, specialized in the described functions. It means the following:

ORDINARY PERSON	The person that mustn't use the machine in any phase above described.
TRAINED PERSON	The person that has read the manual attentively and followed it, has been trained in its use, functioning and safety device use. The person mustn't carry out the maintenance without the principal authorisation. He should observe for some time the work of expert staff.
EXPERT PERSON	The trained person whose duty is to supervise the correct machine use. The person should have experience in voltage circuits and parts.
EXPERT AND QUALIFIED PERSON	The manufacturer's staff

1.3 General characteristics and operating principle

Injection/Mixing grout unit "Minigrout II – " essentially comprises the following elements:

- High shear mixer
- Agitation tank
- Water circulation pump
- Pumping unit (double effect single piston pump)
- Electrical cabinet + control panel
- Electric motors

Minigrout II should be used with fluid mixtures such as mortar, bentonite, additives and concrete aggregate with a 3 mm maximum grain size.

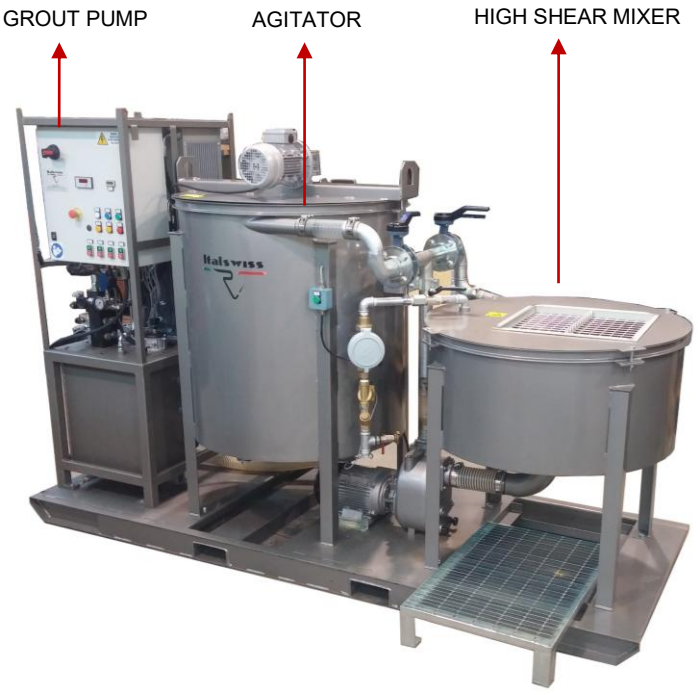


Fig. 1.5.1

These elements are fixed on a steel frame which ensure hoisting, transporting and positioning of the balanced machine.

The description reported herewith is deliberately simplified, as primary purpose of this manual is to provide operators and maintenance technicians with the basic technical knowledge necessary for the safe interaction with the machine and for correct execution of their task.

The two components making up the mixture are fed into the mixer through specific ducts; The cement powder is entered in the tank by the grate with a bag breaker; the water is introduced by the auxiliary water pump and the quantity is monitored by a manual liter counter. The water pump can be used also for the impeller pump washing and to wash the whole machine. The mixed grout is then stored in the agitation tank and, from here, delivered to the pumping unit. The grout reaches the pumping unit (double effect single piston pump) which sucks and injects into the subsoil (= grouting) for soil consolidation or micro piling.

Grouting is performed with this specifics:

- **Qmax: 100 l/min;**
- **Pmax: 100 bar**

1.4. Technical specifications

Below you can find the main technical characteristics:

HEIGHT (control panel included)	195 cm
WIDTH	110 cm
LENGTH	290 cm
WEIGHT	1500 Kg
ELECTRIC MOTORS	7.5 kW High shear mixer 1.5 kW Agitator 11 kW Grouting pump
TANK CAPACITIES	300 litres high shear mixer 650 litres agitator
MODEL	Minigrout II
YEAR OF MANUFACTURE	2025
PURPOSE	Cement and bentonite mixing and grouting
MAX PRESSURE	100 Bar
MAX FLOW RATE	100 l/min

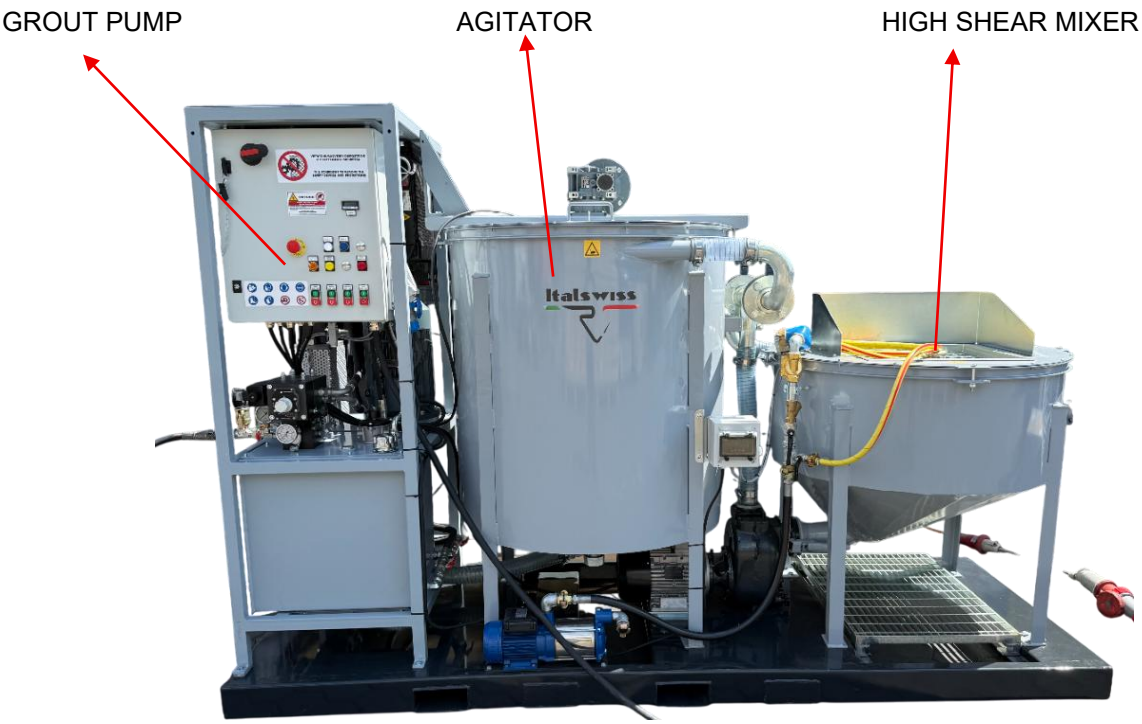
1.5. Main components

The Minigrout II – main components are (see cap. 5.2 “Controls” for more details):

- HIGH SHEAR MIXER
The mixer is composed of a cylindrical tank into which water and cement are fed. The centrifugal impeller placed under the tank is driven by an electric motor that transmits the shaft motion by means of a joint. The impeller is used for both mixing the components and pumping the product into the agitation tank. On the top cover of the tank is fitted a bag breaker. The water is fed into the mixer through a pipe system managed by manual valves whereas the grout is manually fed. A manual or automatic water meter shows the amount of water that enter the mixing tank.

- AGITATOR
The storage tank is composed of a cylindrical tank into which the grout from the mixer is transferred. The paddles inside the tank are driven by an electric motor that transmits the motion by means of an adapter. The paddles are used to keep the grout mixed to maintain it homogenous and prevent it from separation. The mixture is supplied to the pumping unit trough a pipe located at the bottom of the agitation tank.

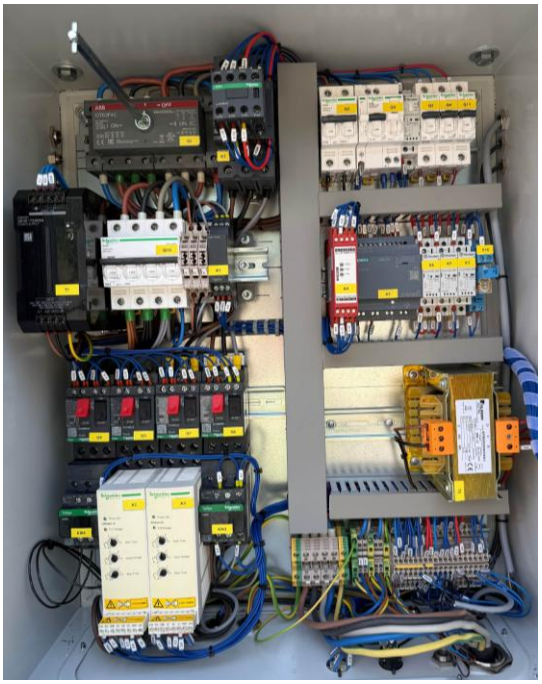
- GROUT PUMP
The grout pump is composed of an electro hydraulic power pack that moves the grout pump. The grout pump is a double effect piston pump. The grout pump can go in low and high pressure and the switich between them is managed by an automatic control block. The oil pressure and flow rate can be managed individually to run the pump at the speed and pressure needed.



- ELECTRICAL EQUIPEMENT

The electrical equipment is composed of a control panel with the main command for the operations. It allow to start/stop the electric motors and begin the grout operations. It mounts a stroke counter, the safety devices and is configurated to be connected to and external data logger.





1.6. Data on CE plate



2
SAFETY NORMS AND ACCIDENT PREVENTION

2.1 General duties and recommendations

Before installing the machine, read carefully the manual.

Before using the machine, make sure that it has not been damaged during transport.

Place the equipment in a safe and stable place, where it is not subject to damages (to avoid its malfunctioning or overturning).

It is strongly recommended wearing Personal Protective Equipment that complies with legally binding standards, appropriate for work conditions and possible risks.

It is forbidden to use the piping system for raising or transporting the machine.

The machine should be considered potentially dangerous at any time. Voltages in the control panel or circuits may cause damage to health or even death. All the staff engaged in operating or maintaining the machine must take precautions against any possible accidents. The user must follow the manual and the actions presented herein.

In order to operate the machine correctly, please follow the safety standards:

1. Always wear Personal Protective Equipment
2. A workplace must be kept clean.
3. Before performing any maintenance, press the stop/emergency button and discharge the tank completely (by opening the quick-coupling in position 5 in the photo);
4. Before re-applying voltage to any electric system, make sure all previously-removed guards have been re-positioned correctly;
5. Do not clean the machine or its parts when it is in motion

2.2 Intended use

The grouting unit MINIGROUT II is suitable for the mixing of water-bentonite / cement and other additives or aggregates with max. grain size of 4 mm. The two main operation the machine do are:

1) Mixing

Common use: Mix of water + cement (max grain size: 4mm)

Alternative use: Mix of water + other component e.g

a) bentonite
b) additives (accelerating)

c) other component whit grain size max: 4 mm

2) Injection of the mixed product for transport, soil consolidation or piling:

a) max flow rate: 100 l/min
b) max pressure: 100 bar



It is strictly forbidden to use MINIGROUT II unit for performing activities or for using materials other than those indicated in this manual. Non-observance of this prohibition will result in immediate termination of the Warranty and in the ITALSWISS SRL exemption from liability for any damage whatsoever caused by the injection/mixing grout units to person or property.

2.3 Qualification of the operators

The use of the grout/injection unit MINIGROUT II is strictly reserved to trained operators:

- Experienced to prepare cement and in general building materials;
- Familiar with the machine and its safety devices, described in this manual;
- Educated and trained in the specific work of the machine in a given field of production;

In particular, workers must be familiar with the differences encountered on the product determined by the variations of the variables involved, such as dosage of the component materials, required water flow rate, pressure, etc.

2.4 Working Area – Dangerous areas

The features of the work areas where the injection/mixing unit MINIGROUT II has to be located are specified in this section. In order to ensure a safe use of the machine, these features must be strictly complied with:

a) The machine cannot be used in an explosive atmosphere;
The assembled electric motors are not suitable for operation in an explosive atmosphere.

b) The machine cannot be used in water or in any other fluid either completely or partially.

The start and the setting of the parameters are made on the control panel.

During the phases of production and injection of the cement, the operators can assume any position around the loading hopper to fill periodically with the materials to be pumped.

According to the different situations that may occur on construction sites and in the construction industry, in the intervals between refueling, the machine itself does not need to be manned.
Keep under control the delivery pipe and the point of injection of the cement product.



THE OPERATOR IS THE ONLY RESPONSABLE OF THE ZONE WHERE THE INJECTION OF CEMENT IN MADE. HE MUST BE ABLE TO CHECK THIS AREA WITHOUT BARRIERS AND OBSTACLES

2.5 Personal protective equipment

The use of the machine does not require the use of particular devices.

In the conduct of construction machinery and in general to work in the construction industry, it is recommended the use of:

- gloves
- overalls
- safety shoes
- goggles or other types of eye protections
- helmets
- earplugs or earmuffs
- any respiratory protection.



Fig. 2.5.1

2.6 Warnings on the machine

 **FIG.2.6.1**	EQUIPMENT UNDER VOLTAGE
 **FIG.2.6.2**	DUTY OF READ THE INSTRUCTION MANUAL
 **FIG.2.6.3**	DANGER OF CRUSHING HANDS
 **FIG. 2.6.5**	LIFT POINT

2.7. Safety devices

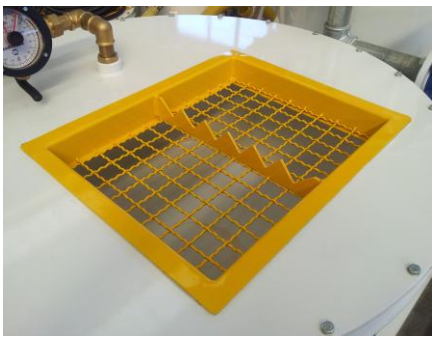




Fig. 2.7.2 Emergency buttons



Fig. 2.7.4 Safety covers

Control regularly emergency button efficiency:

1. Set the master switch in ON position;
2. Control if mains indicator light is on.
3. Push START button.
4. Push emergency button.

AT THIS STAGE THE MACHINE MUST STOP.
RELEASE THE EMERGENCY BUTTON TO GET BACK TO NORMAL FUNCTIONING

2.8 Residual risk

2.8.1 Damaging of piping and electrical cables

Because of the use on the construction site, for accidental reasons independent of the machine, the power cables and pipes are subjected to abrasion, cutting, excessive traction etc.. which may damage the integrity. This can lead to serious risks, particularly due to the loss of electrical insulation.



THE OPERATOR MUST KEEP UNDER CONSTANT CONTROL THE STATE OF CABLES AND PIPES AND REPLACE IT AT THE FIRST SIGNS OF USURY.

2.8.2 Serration of the bag breaker

The grid is equipped with a special "bag breaker" to facilitate breaking of the bags to throw within the hopper (Fig num. 2.8.2.1).

The operator that lay the bag of cement on the grid could injure himself by inserting his hands or fingers between the bag and the teeth.



DURING THE LOAD PRODUCT IN THE HOPPER, THE OPERATOR MUST BE VERY CAREFUL TO AVOID CONTACT WITH THE TOOTHED PART AND ALWAYS WEAR PROTECTIVE GLOVES.

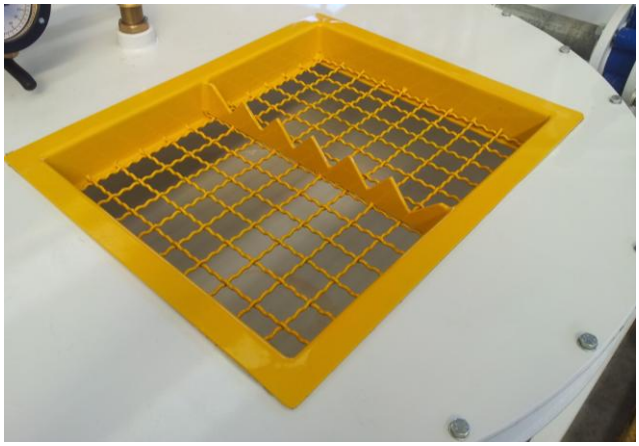


Fig. 2.8.2.1 – Bag breaker

2.8.3 Atmospheric Discharges (Lightning)

Being designed to operate in open areas, the machine is theoretically subject to the risk of being struck by lightning. The specific risk analysis, leads to classify the machine as a "self-protected" against the possibility of a lightning strike; in fact, the probability that it actually affected is very low in relation to other metal structures and masses (trees, rocks, etc..) which in most cases are present in its vicinity during use



ASSESSMENT OF SPECIAL SITUATIONS MUST BE PERFORMED BY YOU IN ACCORDANCE WITH THE REQUIREMENTS OF D.Lgs.81/08.
For example, in case of use of the machine isolated on the summit of a bare, or in a zone officially declared high density of lightning to the ground

2.9. Risks analysis and adopted solutions

- Emergency stop
Emergency stop is installed on the control panel, in the position indicated in section 6. Its action is controlled by a safety control unit, namely a relay triple self-controlled and approved that guarantees the opening of the circuit also in case of failure.

- Stability
If positioned in a horizontal condition as prescribed in the instructions of the section 4, the machine is sufficiently stable on all types of fund thanks to the own weight and friction of the uprights to the ground.

- Risk of ruptures during operation
Any breakages of mechanical parts remain confined within the structure and does not directly affect the safety of the operators.
Regarding the breaking of the supply pipes and discharge see paragraph 2.7 "Residual risks".

- Risks due to falling or ejected objects and materials
The cement injection fluid and semi-fluid even at pressures greater than 4 bar generally does not have a particularly violent effects and therefore does not constitute a serious danger to the safety of people. Any special situations should be evaluated in individual cases.

- Risks related to moving parts
The machine is not equipped with movable parts external to its structure.
The cover of the agitator is equipped with electrical interlock that stops the motor in case of opening during operation.

- Functional safety
The engine cannot be turned on unless the machine is supplied with water at a minimum default pressure. The precaution is to maintain the integrity of the screw pump, which can be seriously damaged by dry running for short periods.

2.10. COMPLIANCE WITH LAWS –APPLIED TECHNICAL SAFETY RULES

2.10.1 EEC Directives
- Directives on the approximation of the laws of Member States relating to MACHINES: 2006/42/CE
(ex 98/37/CE - ex 89/392/CEE, 91/368/CEE, 93/44/CEE, 93/68/CEE)

- Directives on the approximation of the laws of Member States relating to ELECTRICAL EQUIPMENT DESIGNED FOR USE WITHIN CERTAIN VOLTAGE LIMITS: 2014/35/CE (ex 2006/95/CE 73/23/CEE e 93/68/CEE).

- Directives on the approximation of the laws of Member States relating to ELECTROMAGNETIC COMPATIBILITY: 2014/30/CE
(ex 2004/108/CE 89/336/CEE, 92/31/CEE e 93/68/CEE).

2.10.2 Harmonized technical standards of safety type A
- UNI EN ISO 12100 (2010)
Safety of machinery - General principles for design - Risk assessment and risk reduction

2.10.3 Harmonized technical standards of safety type B
- UNI EN 953 (2009)
Safety of machinery – Repair - General requirements for the design and construction of fixed and movable guards

- UNI EN ISO 4413 (2012)
Hydraulic fluid power - General rules and safety requirements for systems and their components

- UNI EN ISO 4414 (2012)

Pneumatics - General rules and safety requirements for systems and their components

- UNI EN 1088 (2008)
  Safety of machinery - Interlocking devices associated with guards - Principles for design and selection

- UNI EN ISO 13850 (2008)
  Safety of machinery - Emergency stop - Principles for design

- UNI EN ISO 13857 (2008)
  Safety distances to prevent danger zones being reached by the upper and lower limbs

- CEI EN 60204-1 (2006)
  Machinery electrical equipment
  Part 1: General requirement

- CEI EN 61000-6-4 (2006)
  Electromagnetic compatibility (EMC)
  Part 6-4: Generic standards - Emission standard for industrial environments

- CEI EN 61000-6-2 (2005)
  Electromagnetic compability (EMC)
  Part 6-2: Generic standards – Immunity for industrial enviroments

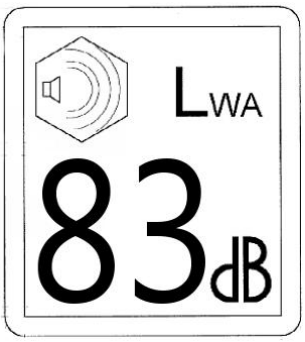
2.10.4 Standards for the measurement of noise

The machine has been designed in accordance with :

Directive 2000/14/EC of the European Parliament and of the Council of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors

The results of the test are as following :

Leq : 65.1 dBA
Lpk : 98.6 dBC
LwA : 82.38 dBA



Please see the attachment for the complete noise test

Previous laws :

- UNI EN ISO 3744 (1997)
  Acoustics - Determination of sound power levels of noise sources using sound pressure method - Engineering method in an essentially free field over a reflecting plane

- UNI EN ISO 11202 (1997)
  Acoustics - Noise emitted by machinery and equipment-Measurement of sound pressure levels in the workplace and at other specified positions - Survey method in situ

3
TRANSPORT AND STORAGE

3.1. Storage conditions

If the machine is not going to be installed immediately, follow the indications given:

- place the machine in a covered, flat area
- remember that storage area must be away from heat sources and excess humidity
- clean and empty the tank
- remove the voltage from the electric plant by turning the master switch to the OFF position
- make sure no indicators are on
- disconnect the power supply cable from the machine plug/socket
- disconnect the unit from the water supply



ATTENTION !
This activity must be entrusted to expert staff that is aware of the safety and maintenance procedures.



ATTENTION !
This activity must be performed by expert staff.

3.2 Packaging

Before starting any operations, check if the content corresponds with the order and the documentation. The machine can be packaged for transport using the following types of product: cardboard and/or plastic and/or wood; the choice of the type of material used for packaging is made on the basis of the customer's specific requests in the order phase.



WARNING!
The customer must dispose of the packaging material in compliance with the laws in force

3.3. Weight and dimensions

Model	Height (cm)	Width (cm)	Length (cm)	Weight (Kg)
MINIGROUT II	195	110	290	1300

3.4. Transport and lifting

For moving over short distances, such as within the production facility, the machine must be lifted and moved with a forklift or similar means, using the proper slots on the steel frame. This is the recommended method and the safest way to move the machine.

When the use of the forklift is not possible, the machine have to be lifted by a crane or bridge crane, using the attachment points (indicated by the stickers on the machine Fig.2.6.5)



WARNING !
Use strings of adequate length and strength, making them pass through the slots in the frame and secured to the lifting hook.



WARNING !
Use extreme caution when making lifting and transport.



ATTENTION !
It is not recommended to use other lifting means



ATTENTION !
Perform lifting with all due precautions.



WARNING !
The machine weighs 1300 kg.

Once the machine is loaded, it must be transported using adequate means. The machine must be kept safe by closing and blocking any parts which may be released during transport.



ATTENTION !
The manufacturer declines any responsibility deriving from damage caused to objects or injury to people during transport,

MACHINE INSTALLATION

4.1. Fixing and anchorage of the machine

The machine does not have to be fixed or anchored to the ground but must have a flat, stable support base. The muddy, gritty or sandy soils should be excluded or at least carefully evaluated.



WARNING!
Do not position the machine on unstable or insufficiently compact surfaces

Level the pump both in longitudinal direction and in the cross direction, taking as a reference the plan entrance of the hopper.



WARNING!
THE BODY LEVEL MUST NOT BECOME UNSTABLE.
If the slope of the soil is higher than about 20 °, it is recommended not to use shims or large objects such as beams or logs, but rather to seek a more stable position.

4.2. Space needed for the machine use

It is recommended to leave a minimum needed space for use of the machine

Space between the front part and an obstacle:	1,000 mm
Space between the back part and an obstacle:	1,000 mm
Space between the left lateral part and an obstacle:	1,000 mm
Space between the right lateral part and an obstacle:	1,000 mm

4.3. Surrounding conditions

The requisites required by the elec components are:

Room temperature:	from + 5° to + 40°
Relative humidity:	from 30% to 95%
Work place:	external site

4.4 Machine connections

4.4.1 Electric supply

The electric connection must be carried out in compliance with standards and must be carried out by expert staff (electrician).

PARAMETER	VALUE
Voltage	AC 400 V
Frequency	50 HZ
Plug	63 AMPERE 5P (3P + N + T)
Variation of the voltage accepted	+/- 5%
Max. current	40 A (PLUG 63 A)

The Minigrout II – P100 injection unit is supplied with a socket/plug. The maximum current absorbed by the machine is 32 A. The power supply cable must be in compliance with the Safety Standards. The three phases cables supply the triphase motors (mixer, agitator, grout pump), the neutral wire supply the auxiliary water pump.



ATTENTION!
The user must mount a residual-current device (RCCB) on his own.



ATTENTION!
Check the existence of ground according to CE standards before connecting the machine to electrical grid.



ATTENTION!
The control panel must be installed in a place where rated short circuit current does not exceed the sum of the powers of the motors.



WARNING!
Machine installation must be performed by the authorized staff.



WARNING!
Erroneous installation may cause damage to people, animals and things, for which the manufacturer cannot be considered responsible.



WARNING!
Do not connect the control panel to low voltage electrical network.

4.4.2 Water supply

The inlet valve thread diameter is 1". After connecting a hose control if it is fitting. The liter counter is semiautomatic: the operator can select the amount of water and it stops automatically when the selected quantity is reached.
It is mounted a water gun to help cleaning procedures.

4.4.3 Grout pump

The machine is supplied already connected to the injection system through a hose of 2 inches and secured with hoses ties.



WARNING !
Pay attention to threads fittings. Control if tubes positioning will not incommode a user's work.

5.
MACHINE USE

5.1 General informations

The use of the machine must be assigned to operators meeting the following requirements:

- They must have read and fully understood the instructions given in this manual
- They must have knowledge of the safety devices the machine is equipped with.

Should the operator detect heavy or unknown failures during the machine operation, he shall immediately stop the machine and request the assistance of skilled technical staff.

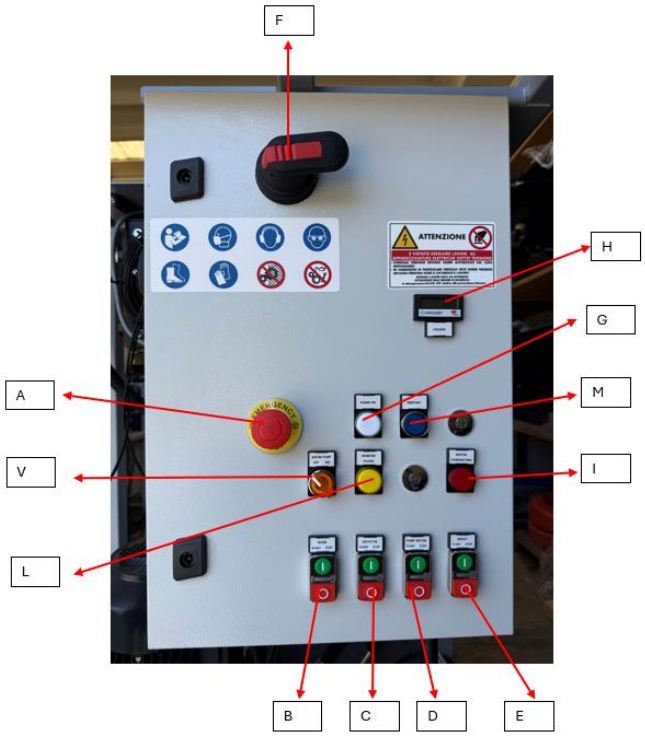


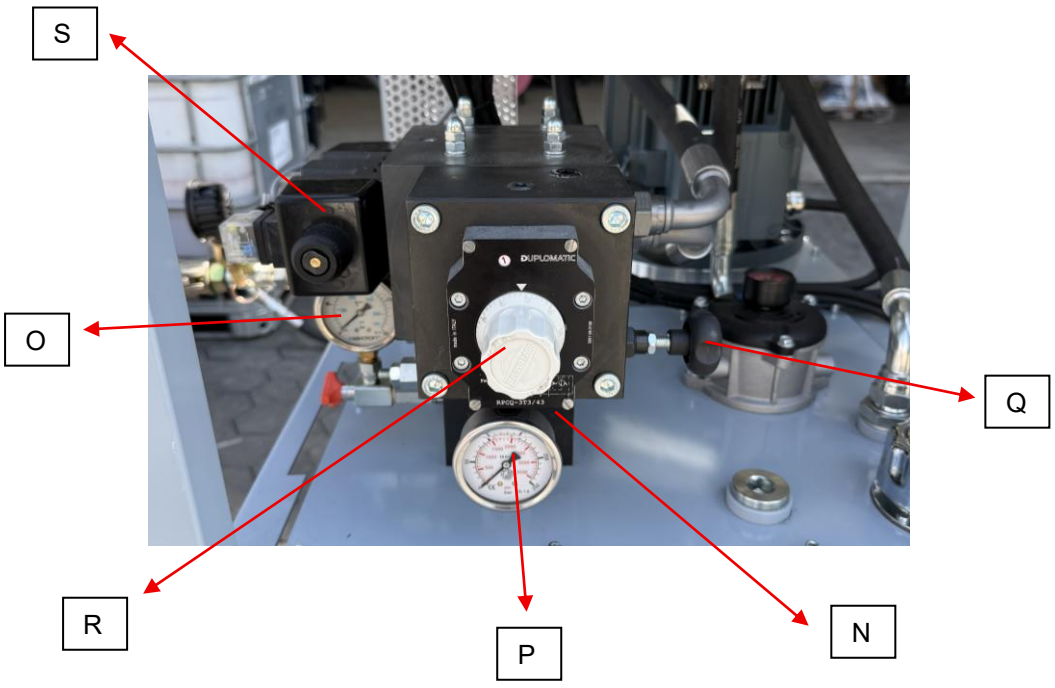
WARNING !
Carefully read and strictly observe the instruction given in Chapter 2 - Safety

For further information or any doubts relating to the contents of this manual, contact the after sales service of ITALSWISS ENGINEERING Srl

5.2 Controls

All the start and stop operations of the three main components of the grouting units (High shear mixer, agitator and grout pump) are managed by the control panel. Two throttles open and close properly allow the mixing of the product and its passage to the agitator tank. Another throttle when opened allow the product to pass in to the grout pump





5.2.1 Commands

COMPONENT	Pos	DESCRIPTION
Emergency button	A	Stopping the machine in an emergency
Start/stop mixer	B	Turn the high-speed mixer on/off
Starting/stopping the agitator	C	Switching the agitator on/off
Start/Stop Injector (Engine)	D	Turn the Injector Engine On/Off
Starting/stopping the injector (pump)	E	Switching the filler pump on/off
Panel Closing	F	Main Switch and Phase Reversal if Reversed
Power supply indicator	G	Indicates that the machine is connected to the power supply.
Stroke counter	H	Count the number of strokes during working time
Engine Overheating	I	Indicates engine overheating
Inverted phases	L	Indicates when phases are reversed
Prestart	M	Allows electric motors to be switched on – to be pushed when they are switched on
High/Low Pressure Hydraulic Block	N	High and Low Pressure Hydraulic Block
Low pressure gauge	O	Active when both oil pumps are operating
High pressure gauge	P	Indicates the oil pressure in the system
Pressure adjustment	Q	Manage oil pressure and reduce grout pressure
Flow rate adjustment	R	Grout pump flow rate management
Bidirectional valve	S	Allows the piston reciprocal movement

5.2.2 Throttles

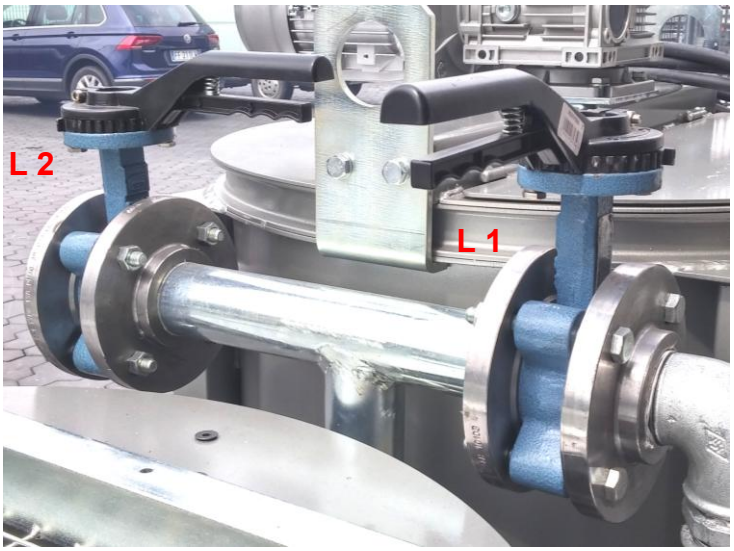
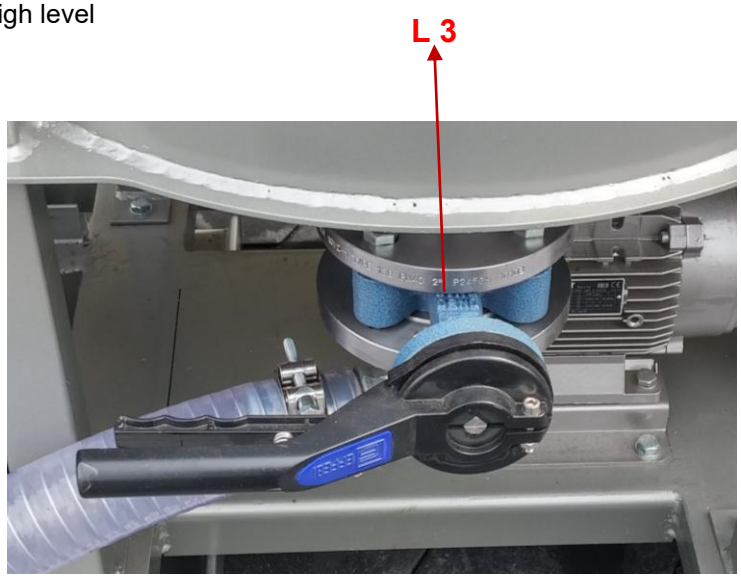


Fig.5.2.2.1

The two throttles “L1” and “L2” alternatively opened and closed allow the functioning of the high shear mixer and the passage of the mixed product from the mixer tank to the agitator tank.

ATTENTION!
Never leave both the throttle closed because the pressure inside the pipe between the valves can reach very high level



The third throttle “L3” allows the product left in suspension into the agitation tank to pass into the injector when opened.

5.3 Commissioning - User instructions

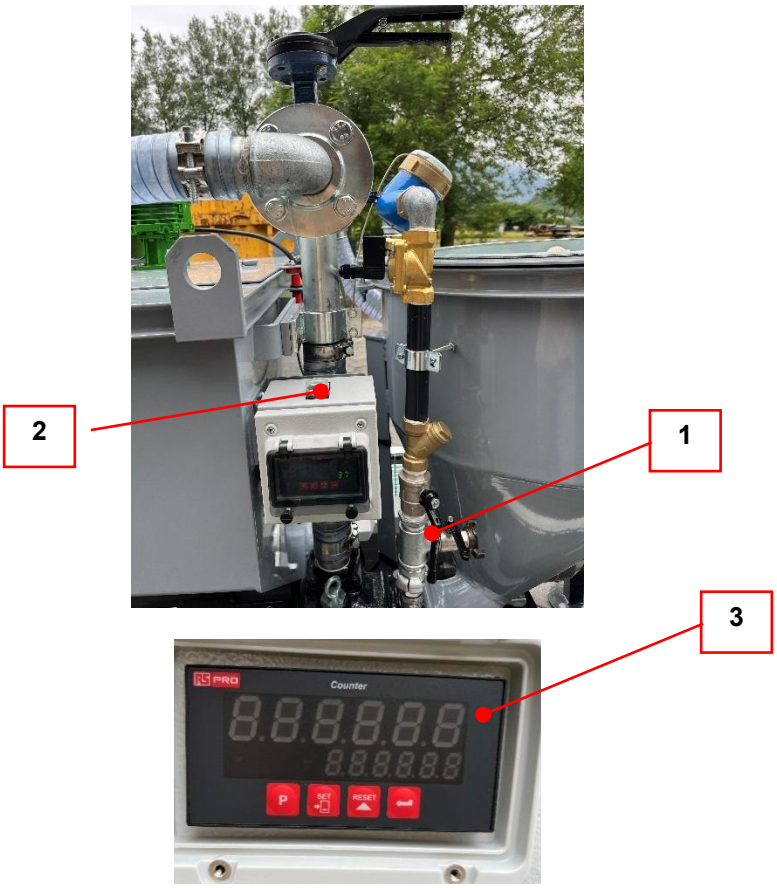
Before start-up check if:

- The machine has been installed correctly
- The electric and hydraulic connections have been correctly installed.
- No foreign body or cement/hardened grout has remained inside the machine tank
- The machine is connected to the water supply and electric supply
- The emergency button is inserted and if it’s necessary unlock it
- The level of the hydraulic oil is between the min and max level

5.3.1 Water loading via automatic dosing system (optional)

The semi-automatic flow meter allows you to introduce the amount of water necessary for the preparation of a mixture with an ideal consistency into the mixing tank.

With the valve (1) open and once the desired amount of water has been manually set (using the display (3)), by pressing the green START WATER button (2), the tank can be filled. Once the countdown by the liter counter is complete, a solenoid valve will stop the water supply

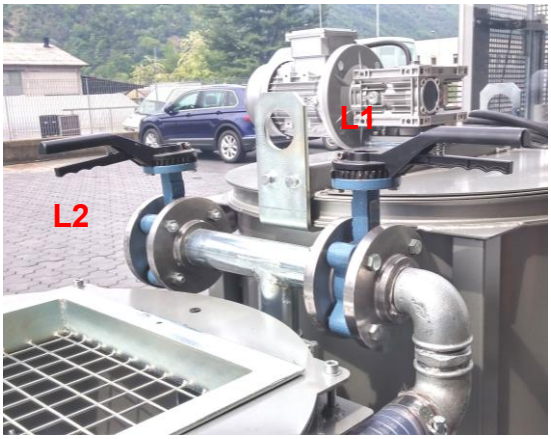


To program the amount of water, proceed by pressing the "SET" button, and using the same button move to the last two digits (1 digit = 1 liter). Pressing the button with the UP arrow changes the value until the desired value is set. Then proceed to confirm with the ENTER key (last on the right).

5.4 Mixing: User instructions

Only one user is needed for activation operations on the control panel.

L1 handle must be open and L2 handle must be close before switching on the high shear mixer (see the photo 5.4.1- Mixing).
A switched on machine must always be supervised.



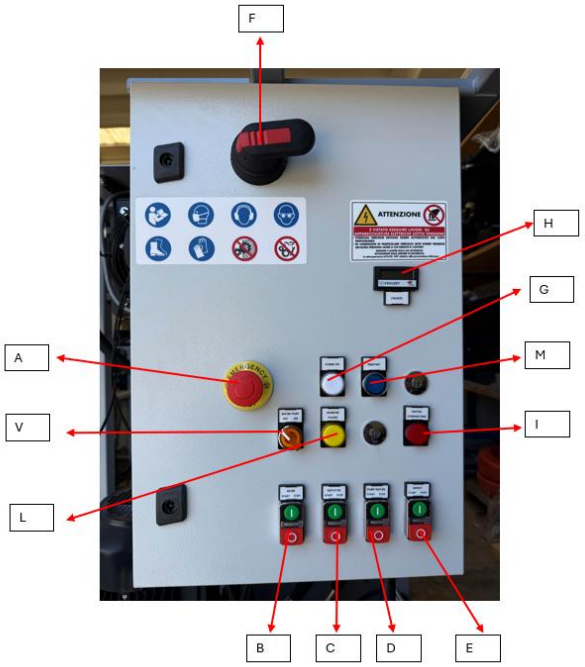


Fig. 5.4.1 – Mixing

5.4.1 Mixing steps

1. Check if the handles are positioned in a recirculation mode (see photo 5.4.1).
2. Connect the electric cable to the network.
3. Open the inlet valve.
4. Introduce the necessary amount of water into the tank using the water meter.
5. Press the start button (B)
6. Introduce bentonite/cement and any additives and aggregates with max. grain size of 2 mm. through the charging hopper.
7. Complete the mixing process (make the mixture homogeneous).
8. Press the stop button. (B)

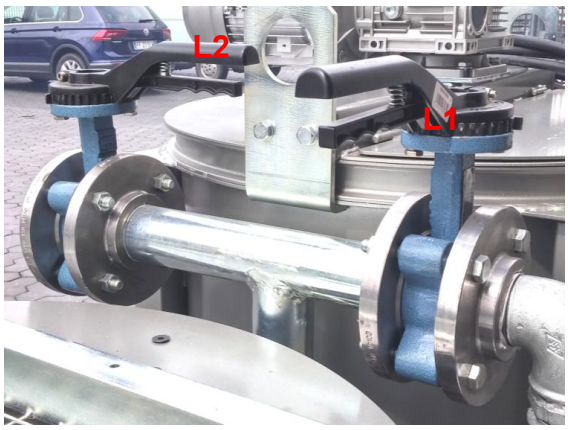
5.5 Passage to the agitator tank: User instructions

Once a work cycle is finished, and the mixture become homogenous, the L1 and L2 handles must be put the middle position to allow a fluid passage into an agitator (see the photo 5.2.1- passage to agitator). Let the product stop circulating than switch on the passage into the agitator. When a high shear mixer tank is empty, position handles in recirculation mode, switch off the high shear mixer (red button) or repeat the mixing cycle.

ATTENTION!

In the passage to the agitator first open L2 and then close L1 !

Never leave both the throttle closed because the pressure inside the pipe between the valves can reach very high level and can damage the centrifugal pump.



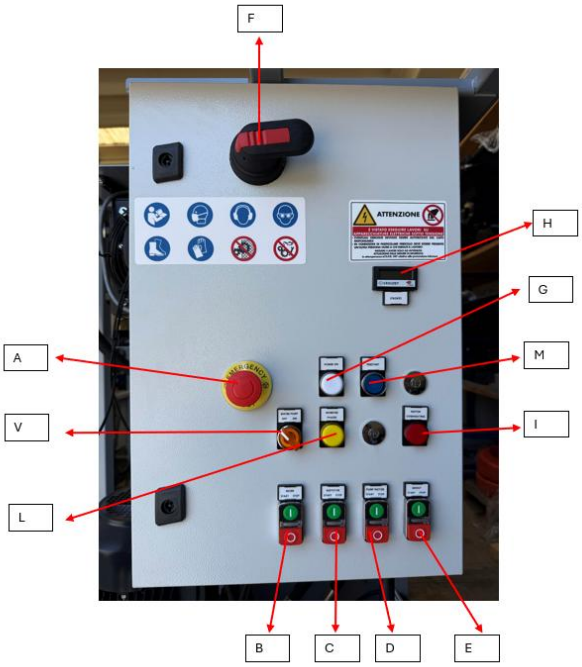


Fig 5.5.1 – passage to agitator

5.5.1 Passage to the agitator steps

1. Place the handles in the correct position to allow the passage to agitator (see photo 5.5.1)
2. Switch on the High shear mixer (B) (The centrifugal pump now transfer the product into the agitator)
3. When the mixer tank is empty, stop the High shear mixer
4. Switch on the agitator (C).
5. When the work cycle is finished switch off the agitator (C)

5.6 Grouting: user's instructions

Only one user is needed for activation operations on the control panel.
A switched on high shear mixer must always be supervised.
The grouting pump can be use also when the agitator is in function.

5.6.1 Grouting steps

The control of the supply of the motor of the injector is on the control panel. The other operation are managed by the handles set directly on the injector pump. To start the grouting operation, initially set the "L3" throttle from close to open position. (Fig 5.6.1.1). The agitator tank can run while the grouting pump is functioning. Always be sure that the cooling system is connected.

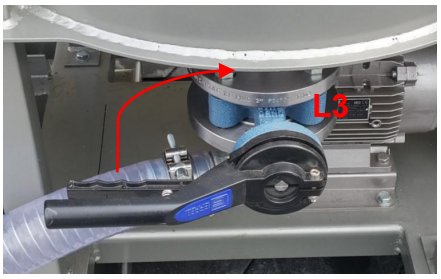
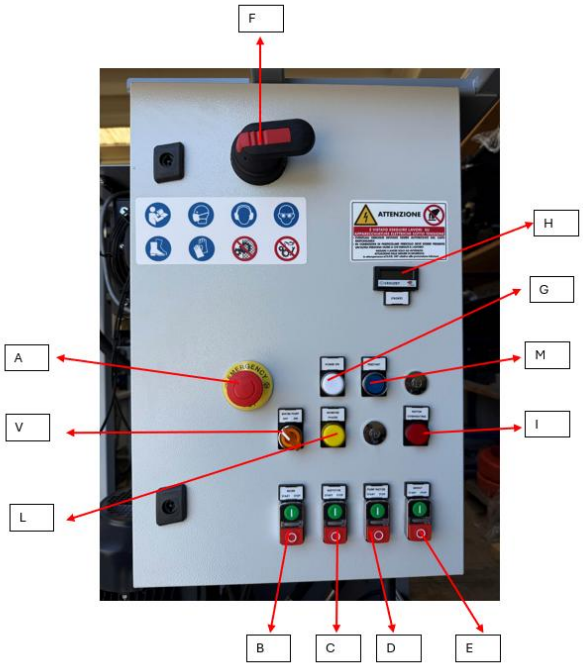
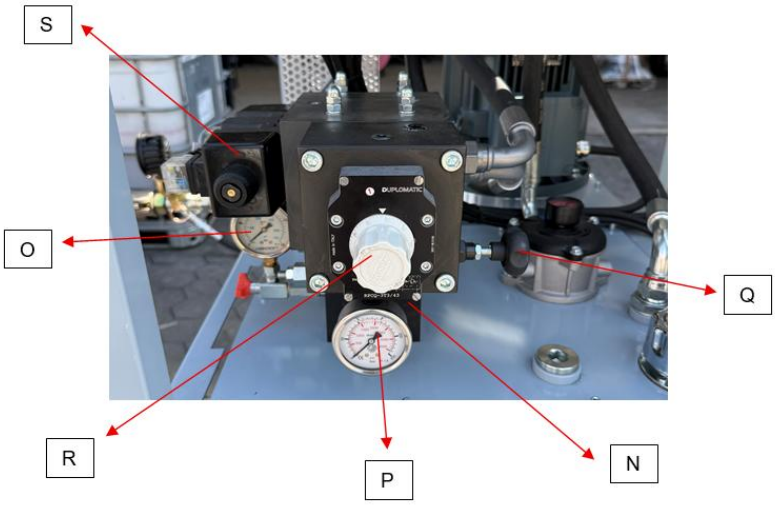


Fig 5.6.1.1

Check if the L3 handle is in open position.



1. Push START button (D+E)
2. Swich the handle (I) to open position
3. Adjust Pressure and flow rate with Q and R handles
4. The system switch automatically by high/low pressure trough the pressure switch
5. The grouting pump must be cleaned with a flow of pure water after every single work cycle.



Grouting is performed with this specifics:

- **Qmax: 100 l/min;**
- **Pmax: 100 bar**

ATTENTION !
Before starting the machine, check if there are no foreign bodies inside the tank that may block its functioning.
During the soluble parts (bentonite, etc.) loading, the use of Personal Protective Equipment is mandatory.

ATTENTION !
Always check the information in the used substances safety instructions.
Prolonged functioning of the empty machine can lead to its damage.
Press the STOP button of the high shear mixer as soon as the mixture has been transferred into the storage tank.

ATTENTION!
The cooling system must always be connected
(Fig. 5.1.6.5)



Fig. 5.1.6.5

5.7 Cleaning

5.7.1 Tank cleaning

Clean with a stream of water all the parts where any signs of mixture are remained. Remove all the residual water to prevent it for freezing. It is possible to use the auxiliary water pump to wash the whole machine.

5.7.2 Centrifugal pump cleaning

The pump must be cleaned with a flow of water after every work cycle. It should pass from high shear mixer and agitator until only clear water flows out. The next step is to disconnect the tube between the agitator and the pump. It is recommended to put a small quantity of oil directly into a cement outlet connection.
On the body pump there are two inspection opening, to better check and in case clean the inside of the body pump. (Fig. 5.7.2.1 A-B). It is possible to use the auxiliary water pump to wash the mechanical seal. On the top of the pump it is mounted a quick coupling to connect the hose from the water pump.

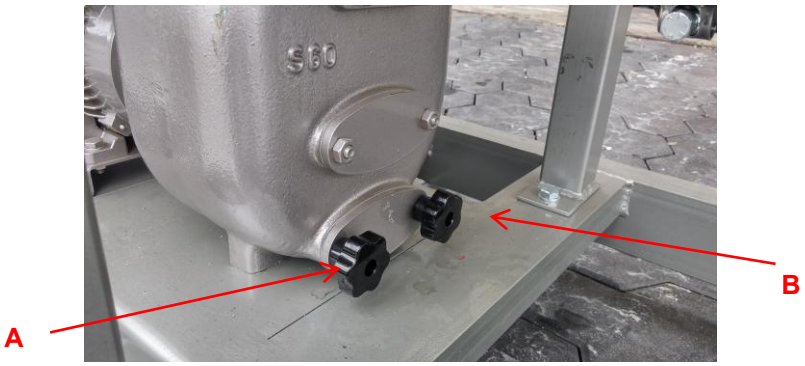
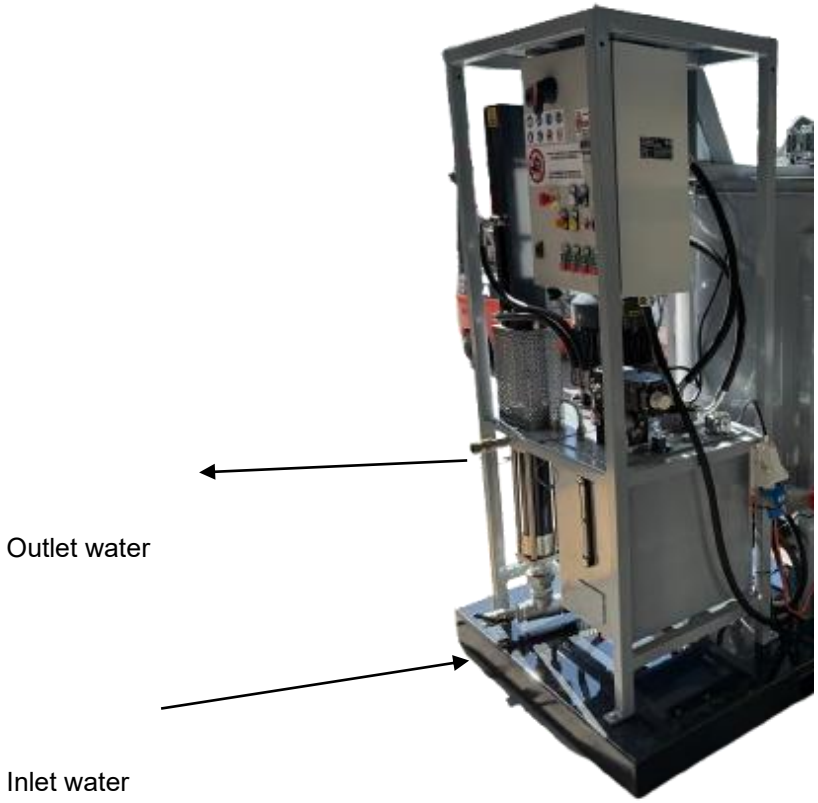


Fig. 5.7.2.1 A – B Inspection openings

5.7.3 Injector Cleaning

The pump should be cleaned with a stream of water after each work cycle. The water must pass through the turbo mixer and agitator until only clear water comes out. The next step is to disconnect the tubing between the agitator and the pump. **Disassemble the quick coupling cap on the bottom of the injector and plug the water hose. Allow clean water to pass through the pump until it exits the concrete outlet.**

Connect a line of pressurized water to the quick coupling located at the suction of the injector and close the butterfly valve under the agitator. In this way, clean water will pass inside the cement pump, cleaning it of cement residues. During these phases, keep the injector on so that the movement of the cylinder helps cleaning.



6.
MAINTENANCE

6.1 Warnings

An appropriate maintenance is essential for longer duration of the appliance both at a mechanical and a safety levels. These operations must be carried out by trained staff.



ATTENTION !
All maintenance operations must be performed with the machine disconnected from the electric and water networks.
All operations must be performed wearing gloves and personal protective equipment.

6.2 Machine disconnection

Any maintenance and repair must be performed with the machine disconnected and out of service.

1. Master switch in OFF Position and socket/plug disconnected.
2. Use a sign to indicate: “Machine out of service”.

6.3 Maintenance safety standards

- All maintenance operations must be performed with the machine disconnected from the electric and water networks.
- All operations must be performed with gloves and personal protective equipment.
- Do not wear rings, watches, necklaces or any other loose objects during the maintenance.
- Use only original spare parts.
- Do not use a naked flame.
- Do not smoke.

6.4 Operations on the machine

The operations can be divided into:

- Preventive and ordinary maintenance concern all activities to keep the machine efficient. This type of operations can be performed by trained staff.
- Extraordinary maintenance concerns all interventions due to breakdown, anomalies and replacement of spare parts. This type of operations can be performed by expert and qualified staff

6.4.1 Ordinary maintenance

This type of maintenance is carried out to maintain the system, so you need to clean it at each end work and carry out the following maintenance:

OPERATION	FREQUENCY	CONDITIONS
Cleaning of the tank and impeller Injector cleaning	At the end of every work cycle	See the paragraph 5.7
Check the functioning of the liter-counter	Daily	
Check the efficiency of the emergency button	Daily	See the paragraph 4.2
Check tank integrity	Daily	All of the operations described must be performed on switched off equipment without carrying out working activities
Check integrity of the pipes	Daily	
Check nut and bolt tightness	Monthly	
Check warning signs	Yearly	Check if the pictograms are present and correctly positioned.
Check the level of the oil in the lubrication points.	Monthly	

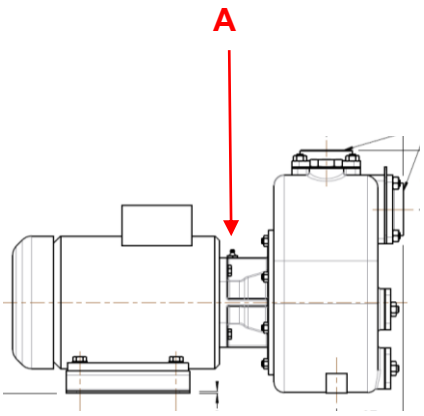


Fig. 6.4.1.1 – Lubrication points: A-Water circulation Pump

NOTE: The frequency of the maintenance is calculated for use of the machine for 8 hours a day. In the case of different use, the maintenance must be adapted suitably.

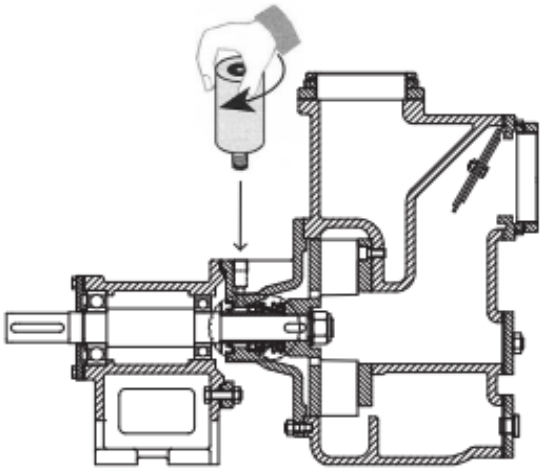
NOTE: Please refer to the attached User and maintenance manual of the circulation pump for further information.

D. Automatic Grease Lubricator

1. Description

1.1 The automatic lubricator (+PS) is a long-term grease dispenser activated by a hydrogen gas producing dry cell. The lubricator contains 125 ml of grease dispensed during a period of 12 months. The operating temperature is min -20°C and max +55°C (-4/+131°F). The weight of the full lubricator is approx. 190g (6.7oz) and empty approx. 75g (2.7oz). The grease is special water-repellent, suitable for alkaline products.

1.2 Storage time of the cartridge should not be longer than 2 years.

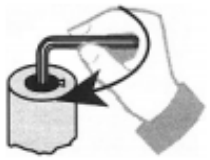


2. Installation and activation

2.1 Open the lubricator outlet by removing the plug.

2.2 Screw the lubricator in the hole with ¼" thread on the head of the pump. If the hole is already closed by a tap or grease nipple take this part away. If necessary, use the extension to mount the lubricator.

2.3 Set the gas generator to **position 12 (12 months)** using a size 3 mm Allen key.



2.4 With a waterproof pen register the starting date on the label. The life time of the lubricator is 12 Months. Replace afterwards the empty lubricator with the same type.

3. Notes

3.1 After activating it can take some days, until grease is dispensed for the first time.

3.2 The lubricator can be readjusted or switched off (position 0) during operation. If you unscrew the lubricator the created pressure in the quench chamber will be lost and the life time of the lubricator will be less.

3.3 In order for the lubricator to function reliably it is important to have the quench chamber already filled with grease. If you change the mechanical seal it is important to refill the quench camber and the line before installing the lubricator.

4. RECYCLING

4.1 Unscrew gas generator from the lubricator and dispose the complete part in the battery recycling.

WARNING Do not unscrew the gas generator from the lubricator near a naked flame.

4.2 Dispose of empty housing of the lubricator in the PET-recycling. If the lubricator still contains grease, please dispose it in accordance with the local regulations.



6.4.2 Extraordinary maintenance

In case of long-term downtime, it is recommended to clean and lubricate tanks and to disconnect all connection hoses (high shear mixer-agitator-pump).

6.5 Electric circuit maintenance

This type of maintenance must be carried out by expert staff with the qualifications of electrician.
All the operations must be performed with the master switch in the OFF position, disconnecting the equipment from the electric network (disconnecting the socket/plug).

6.6 Troubleshooting: causes and solutions

PROBLEMS	POSSIBLE CAUSES	SOLUTIONS
The machine does not start up	No electric power supply Lack of mains indicator light	Put the master switch in ON position and connect the socket/plug to the network. Control circuit breaker
Leaking of liquid from flow diverter	Broken hose	Switch the machine off. Replace the pipe with a new one that has the same features.
Grout flow rate below nominal	Impeller wear or circuit pipes blocked	Clean the machine according to the procedures. If defect persists, contact the after-sales assistance.
Excessive impeller noise	Impeller wear	Contact after-sales assistance.
Lack of cement aspiration	Sealings wear	Contact after-sales assistance.
Performance deterioration	Sealings or valves do not fit	Contact after-sales assistance.

7.
MACHINE REMOVAL

When the machine is put definitively out of service it may be destroyed. Before doing this:

- remove electrical and mechanical components;
- divide and remove rubber parts and any other materials that are not iron;
- remove the electric motor;

Everything that is removed must be collected to be selectively recycled, while the rest of the machine can be destroyed as any other metal parts



ATTENTION !
The machine must be demolished in compliance with standards. This intervention must be entrusted to expert staff that is well aware of the safety and disposal procedures.

8.
INFORMATION NOTE FROM THE MANUFACTURER

Read this manual before starting to use the machine.

For operator's safety the machine devices must be kept efficient.

This document has the scope of certifying that the devices installed on the machine are efficient, the manual has been delivered with the machine and that is operator's responsibility to follow it.

COPY TO SIGN AND RETURN AFTER THE MACHINE SET-UP.

COMPANY NAME:
_____

MODEL:_____

SERIAL
NUMBER:_____

YEAR OF
MANUFACTURE:_____

SIGNATURE:_____

9.
WARRANTY CONDITIONS

1. The period of machine and other products warranty is 12 months from a delivery date.
2. In case of incomplete, incorrect delivery or evident defects, the Customer has to inform the Manufacturer in a written form within 8 days from the goods receiving.
3. The warranty consists of free repair or replacement of defective parts (qualitative, constructional and processing defects).
   The machine or clearly defective parts must be returned to the Manufacturer's factory or in a workshop indicated by him. Shipment and transport are always charged to the Customer.
   The Manufacturer takes no responsibility for a possible standstill or lack of production.
   Potential interventions in a construction site are to be agreed when needed and will be invoiced.
   The control and research on defects and their causes can be carried out only by the Manufacturer or an authorised person.

   The pieces under warranty must be returned to the Manufacturer's within 30 days from new parts receiving. In case the goods are not returned by this period, the new pieces will be invoiced to the Customer. The shipment of the goods is always charged to the Customer.

   The warranty does not cover normal wear, damages caused by use, wrong maintenance, external factors and transport. What is more, the warranty does not cover any damages caused by use of improper accessories.

   All the wear parts are listed in the user's manual.

   The warranty expires when:
   - Payment conditions are not fulfilled.
   - Products are used for other works than those intended.
   - Products are modified or repaired not in the authorised workshops.
   - Defects and damages are caused by negligence or incorrect use.

10.
ATTACHMENTS

- CE declaration of conformity
- Wiring diagram
- Part list

Italswiss Engineering S.r.l.

DOC. N° _____

DECLARATION CE OF CONFORMITY

(Directive 2006/42/EC, Annex II, item A)
Original version

The Manufacturer: ITALSWISS Engineering srl
Address: Strada Romana di Sotto 27 - 28877 ORNAVASSO (VB) Italy
Tel. / Fax. 0039 0323 837 116 /0039 0323 835 369
Website / Email www.italswiss.com / info@italswiss.net

declares that the machine:

Name: _____

Model: _____

Customer: _____

Serial number: _____

Year of manufacture: _____

- complies with the provisions of the Directive on MACHINERY: 2006/42/EC (formerly 98/37/EC, formerly 89/392/EEC, 91/368/EEC, 93/44/EEC and 93/68/EEC)
  Italian implementing law: Legislative Decree 17 dated 01/27/2010.
- It complies with the provisions of the Directive on ELECTRICAL MATERIAL DESIGNED FOR USE WITHIN CERTAIN VOLTAGE LIMITS: 2014/35/CE (formerly 2006/95/EC 73/23/ECC and 93/68/ECC).
  Italian implementing law: Law 791 dd. 10/18/1977
  Technical standard applied: CEI EN 60204-1 (2006)
- It complies with the provisions of the Directive on ELECTROMAGNETIC COMPATIBILITY: 2014/30/CE (formerly 2004/108/EC 89/336/ECC, 92/31/ECC and 93/68/ECC).
  Italian implementing law: Legislative Decree 194 dated 11/6/2007.
  Technical standard applied: CEI EN 61000-6-4 (2006) - CEI EN 61000-6-2 (2005)

The technical manufacture file has been constituted by ARRIGO SCARIN at ITALSWISS ENGINEERING srl

Issued in _____

Date _____

CEO and Legal Representative
Enrico Scarin