

Operating Manual

SBS Mortar Mixing Pump

CL 06



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1. Preface:

Dear Customer,

We are pleased that you have chosen with the purchase of a Clever & CO mortar mixing pump for one of our products.

The Clever & CO CL 06 is a continuously working mortar mixing pump which allows the easy mixing and pumping of machine-process able mortars, lime-cement mortars such as grout, injected anchor grout, insulating mortar, plaster, masonry mortar, insulating plasters, joint grout, mineral floor screed, concrete for elements and infill or cement in a single operation.

It is designed and manufactured as a modular system. Our aim of the development was that it can be easily dismantled and transported, e.g. in an estate car.

Furthermore, the robustness of our Clever & CO pumps and the rapid help available in the case of difficulties on the construction site or when replacement parts are required has been tried and tested in Europe for over 15 years.

All parts can be replaced. Provided it is regularly cleaned and maintained, this makes the mixing pump a trusty companion for many years, without which the hard day-to-day life on the construction site can no longer be imagined.

For weight reasons not at least the Clever & CO pumps are equipped with only one geared motor which feeds the material from the hopper into the mixing chamber where it is mixed with the continuously injected water. Then the mortar is pressed into the hose by means of the screw pump.

In addition we took great care to provide simple function and operation. The operation is very clear and simple.

All controls of the machine (pressure-control of water; pressure inside the mortar hose; water injection; switching on of the vibrator; booster pump) are readily accessible from the operator-position.

The flow rate may be handled variable, by using different screw pumps which can be changed quickly by a few simple steps.

For the education at the machine, the processing of various materials and the complete maintenance will be the technical personnel of the Clever & CO GmbH available.

We hope you enjoy the working with your new Clever & CO mortar mixing pump.

Operating instruction:

These instructions contain important notes in order to ensure safe operation of the machine.
It should be always be available

The instruction must be carefully read before start-up, so you can familiarize yourself with the handling of the machine and its functions.

The generally accepted local safety instruction must be met in order to perform a safe and smooth operation of the machine.

The contents of this manual with all safety notices and regulations, as well as the relevant local rules and regulations for accident prevention, are of all persons who are working on the machine, to abide by.

2. General

2.1 Safety measures

The operating instruction is constantly kept at the machine.

Additional to the operating instruction, are valid the local regulations for accident prevention and environmental protection.

All safety instructions and warnings on the machine have to be kept absolutely in a legible condition and have to replace if be necessary.

2.2 Warranty and liability

Warranty and liability claims for personal injury and property damage are excluded when one or more of these below, listed causes are applicable:

- failure to the operating instructions in the instructions on installation, operation, cleaning, maintenance and transportation
- unauthorized modifications to the engine or its accessories (e.g. the change of the drive system, the pump system, protection devices, controls, etc.) require the written consent of the manufacturer
- delayed replacement of wear parts (e.g. screw pump, mixer shaft, eccentric-tensioner for motor-pump flange, etc.)
- improper installation of the attachments
- improper operation of the machine
- disregard for the manufacturer's instructions about the materials to be processed
- improper maintenance or repairs
- operating the machine with defective safety devices, or not properly fitted, non-functioning safety and protection devices
- damage to the machine and its accessories due to majeure or under the influence of foreign bodies

**Hinweis**

The Clever & CO GmbH or their dealers, will from all commitments - such as service contracts, warranty agreements, etc. - immediately without notice rescind, if other than the original Clever & CO spare parts for operation, maintenance or repair be used.

2.3 Risks in dealing with the machine

The Clever & CO mortar mixing pumps are build according to accepted safety rules.

**Achtung**

By improper handling of the machine, it can result in serious injury or death to the user or third parties. Also there may be damage to the machine or other property.

The machine may only be - in a safety-related/ perfect condition - by properly handling be put into operation. Disorders that affect the safety must be corrected immediately.

2.4 Appropriate and inappropriate use

The designated use of the Clever & CO mortar mixing pump is the mixing and the pumping of factory premixed - machine usual dry mortars - such as cement and anchor mortar, up to a grain size of 16 mm.

**Achtung**

It may only used: machine-compatible material (cement, mortar, etc.).

Other as stated above uses are improper and prohibited.

When using other mortars or substances, the warranty and warranty will be void immediately.

For this damages, the operator liable exclusively!

2.5 Actions by the operator

The required personal protective, must be provide by the operator of the machine (according to UVV).

All (existing and mounted on the machine) safety equipment must be maintained and check at regular intervals on their perfect function.

After delivery of spare parts, are the protective by the operator, to re-attach in the prescribed manner.








2.6 Safety devices


Before each use of the machine, all safety equipment must be properly attached and functional.

Protection devices may only be removed:

- at standstill
- and after hedge against restarting the machine (e.g. padlock at the main switch)

3. Legend

	<p>Reference to an imminent threat to the health or life of people.</p>
	<p>Reference to a possible danger to the health or life of people.</p>
	<p>Reference to a potentially dangerous situation.</p>
	<p>Reference to a possible electrical shock. Work must be performed by trained personnel.</p>
	<p>Reference to a possible hand injury.</p>
	<p>Reference to a possible of a collision.</p>
	<p>Reference to important information on the economic use or prevention of disturbances of the machine.</p>

 Hinweis	Reference to useful tips and advice in handling the machine.
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4. Education

The prerequisite for the proper operation of the Clever & CO mortar mixing pump, is the exact knowledge of the operating instructions and of the safety regulations!

The operating, safety and work instructions are binding.

Every person which is responsible for installation, commissioning, operation, maintenance and repair, has to read and understood the operating and safety instructions.

- Prerequisite: physical and mental fitness, responsibility and reliability
- Proof about the fact that an instruction is done in the following points:
 - handling
 - maintenance
 - repair
- Minimum age: 18 years
- Operator: only trained and qualified personnel
- The responsibilities for alteration, operation and maintenance must be determined.
- The instructor may only be an experienced and trained person.
- The instruction at the machine must be set down in writing.

4.1 Training certificate

to be executed activity	people			
	instructed	with technical training	electrician	manager with professional competence
commissioning				
operation				
troubleshooting				
mechanical troubleshooting				
maintenance				
repair				

5. Copyright

The contents of this operating instruction are subject to copyright.
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All rights reserved.

No part of this operating instruction may be reproduced or be changed in any form - be processed by other systems; be transmitted photographically; or be distributed - without permission of the Clever & Co GmbH. Changes in content and drawings of the instructions are reserved.

Claims against the manufacturers can't be derived from the operating instruction

6. Dangers by electrical energy

- Only authorized electricians may perform work on the electrical supply and the switch box.
- The opening of the switch box may only be made by authorized personnel, after pulling out the plug.
- A check on the electrical equipment must be made regularly.
- Deficiencies must be rectified immediately.
- All safety instructions and warnings on the machine must be kept absolutely in a legible condition and must be replaced, if necessary.
- The operational safety should be checked before each use.

Elimination of defects:




Danger to operational safety

- Machine off, operations supervisor inform
- Defect removal by authorized personnel

No risk of the operational safety

- Switch off the machine - defect removal - operations supervisor inform

7. General safety

	<p>When operating the machine must eye protection worn be.</p>
	<p>When operating the machine must gloves worn be.</p>
	<p>When working with mortar must be worn a face mask.</p>



When operating the machine must be worn ear protection.

- The activation may only by trained - reliable - not under the influence of alcohol or drugs working - personnel - which were determined by the entrepreneur and have been trained in the use, operation and maintenance of the machine.
- The instruction and the training on the machine may be performed only by trained users.
- The operator of the machine must ensure that no other person is present in the vicinity of the machine.
- The handling of the machine and the observance of the warning lights are, how explained in the Operating instruction to carry out.
- The machine must be level and stable (to prevent unwanted movements) be placed.
- The machine must be operated with appropriate clothing (no scarf, no tape, or similar things that can be drawn into the machine).
- The mixing-motor do not turn on in a tilted position.
- Before cleaning the machine, the power supply must be interrupted.
- For maintenance and repair work, the main switch is to be secured by a lock; or the power supply must be interrupted (pull the plug).
- Work on live parts must be carried out by qualified personnel and in the presence of another person - which may shut off the power in an emergency.
- Before each change of location, the power supply must be disconnected, and will properly connect again before starting up the machine.
- The power connector on the machine must be conform with the local usual safety regulations.




The Clever & Co mortar mixing pump with protection IP 44 according to DIN 40050 must not be cleaned with water jets.
The distribution cabinet must always be properly closed.
The distribution cabinet - seal must be checked of proper fit after each removal of the lid.


- The mortar hoses, the power cable and the water supply, must be free of kinks and should not be run over sharp edges to prevent of damage or stodger. This must be observed for example at: => position-translocation.
- Only appropriate mortar hoses are used.
 - operating pressure 40bar (600 PSI)
 - burst pressure 100 bar (1500 PSI)
- Before loosening (decoupling) of the mortar- hoses verify that no pressure is present.
- At a removing of stodger in the mortar hose (wear protective goggles!) the working person must stand in such a way, that she cannot be taken by the escaping material or that it can lead to property or personal injury.
- The machine must be checked at regular intervals by qualified personnel.



The fold down of the mixer motor and pump flange is not allowed during:

- running machine
- connected power supply
- main switch to ON

 Wichtig	<p>Attention automatic cut-out!</p> <ul style="list-style-type: none"> • For safety, the machine can be operated only with a grid with sack opener • When lifting the grid during the operation, the machine stops immediately
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 Hinweis	<p><u>All modifications to the machine or a manipulation on the automatic cutout, excludes any responsibility from the manufacturer for effects on people, machines and others things out!</u></p>
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8. Technical description

8.1 Funktion

The Clever & CO CL 06 is a continuous working mortar-mixing- pump which make the simple mixing and pumping of machine-compatible mortar, such as lime, cement mortar, grouting mortar, anchor- mortar, injection mortar, insulation mortar, plaster- mortar, masonry mortar, insulating plaster, thixotropic mortar, mineral floor- balancing masses, element and filling- concrete, cement, etc. possible in one operation.

8.2 Technical data

electrical connection	:	3x 400 VAC / N / SL - 50 Hz / 32A / 5 pins CEE-Norm
control voltage	:	24VDC
gear motor	:	5,5 KW / 11,5A / 190 rpm
water pump	:	0,75 KW / 2,0A (optional)
vibrator	:	0,18 KW / 0,35A (optional)
mixing tube	:	internal diameter 180mm
pumps system	:	screw pump MP1 – MP18 – „large“
grain size	:	depending on worm pump up to 8mm
conveyor capability*	:	depending on the screw pump and speed of rotation 3.2 to 80 liters
pumping distance*	:	60 meters or more
pumping pressure	:	40 bar
remote control	:	24VDC (optional)



* depending on the material and screw pump

8.3 Weights and measures

length machine	:	1040 mm
length with propulsion	:	1350mm
length with drive unit and pump unit	:	1850mm
height	:	930 mm
height of the grid	:	95 mm
width	:	650 mm
wheelbase-width	:	520 mm
weight drive system	:	59,0 kg
weight pump- system	:	26,0 kg

weight grid : 12,0 kg
total weight : ca. 230 kg

8.4 Display and control/ plug and screw connections

 <p>1</p>	<p>1 – pushbutton GREEN = START</p> <p>2 – pushbutton RED = STOP</p> <p>3 – toggle switch = operation</p> <p>4 – toggle switch = water pump (optional)</p> <p>5 – toggle switch = vibrator (optional)</p> <p>6 – signal lamp</p> <p>7 – connector = remote control</p>
 <p>2</p>	<p>8 – emergency-stop- button = STOP</p> <p>9 – automatic reverse (“back driving”) = mixer motor return</p> <p>10 – master switch</p> <p>11 – rotary field- examiner</p> <p>14</p>



3

12 – socket 230V = Additional socket for portable machines

13 – socket = gear motor

14 – socket = power cable

8.4 Power supply

3x 400 VAC / N / SL - 50Hz / 32A / 5-pin CEE Norm

- The electrical connection must at one the customary national safety instructions corresponding, secured power distribution with 5-pin, 32 amp socket (CEE connector), be connected (with 25 amp fuse).
- The cable used must have a minimum cross section of 4mm² per wire to show.
- The power cable is kept as short as possible, to avoid voltage sags.
- Too narrow cross section or too long cable can result in damage to the electrical control or the engines

	<p>Required grounding:</p> <p>The machine must be connected to the grounding screw at the frame.</p>	
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4

	<p>The machine may only be connected to a power distribution with RCD (residual current operated device) or at one customary national safety instructions corresponding power connection (electrically ensured with 3x25A).</p>
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8.6 Review of the rotating field

For the direction of rotation- test there is a rotary field-examiner at the control box

1. Put the mains plug of the main supply line, into the phase- changing- socket (14).
2. Main switch (10) on position "1"
 - Green indicator light illuminates → everything OK


 <p>5</p>	<p>green → direction of rotation is real red → direction of rotation is wrong green+red → phase is missing in the supply cable</p>
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- red lamp lights → turn the phase inverter
3. The main switch to position "0" then remove the power plug.


 <p>6</p>	<p>By pressing gently with a screwdriver, a lock in the phase inverter is released and the two poles can be rotated by 180 °</p>
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4. Insert the mains plug into the phase- changing- socket and control the rotary field-examiner again.
- If both lamps of the control light lights → phase is missing in the supply cable or in power distribution.
 - Work must be performed by trained personnel.


All integrated consumers are factory-adjusted so that by the glowing of green lamp of the phase sequence indicator, the respective rotational directions are correct.

	<p>Technical control at running machine.</p> <ul style="list-style-type: none"> • Direction of rotation arrow at mixer motor. <p>→ look from the back of the engine, with view of the fan blades, is rotational direction anti-clockwise.</p>
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	<p>Only with correct rotating field indicator, the machine may be operated.</p>
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	<p>With each repair, with replacement of a damaged plug or with the connection of an additional power cable, the phase sequence indicator must be checked again.</p>
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	<p>The opening of the control cabinet may only be made by authorized personnel. Before opening the control cabinet the plug must be drawn.</p>
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	Secure work area during the troubleshooting
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8.7 Security system


- Emergency stop monitoring EN 418 / ISO 13850 us EN/ICE 60204-1
- Monitoring of limit switches on protective equipment EN 1088

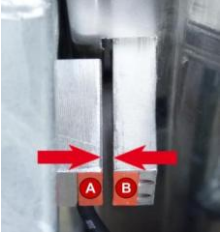
For immediate shutdown in case of danger, is a tamper-safe emergency stop button (8) attached at the control cabinet, which is monitored by a security module.


	<p><u>switching states:</u></p> <ul style="list-style-type: none"> • pressed → emergency stop button activated → red signal lamp (6) on • drawn → machine ready → red signal lamp (6) out
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As automatic cut-out is a magnetic- safety switch installed.

- The magnet (B) must, with the correctly laying of the grid, be located immediately before the safety switch (A).

	<p><u>switching states:</u></p> <ul style="list-style-type: none"> • grid lies on correctly → machine ready → red signal lamp out • grid lifted → automatic cut-out active → red signal lamp on
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 <p>9</p>	<p><u>Operating distance:</u></p> <ul style="list-style-type: none"> • Magnet power-distance → 5 mm • Magnetic switch-off distance → 15 mm
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	<p>Emergency stop button is pressed, or the grid is lifted, the red signal lamp (6) on the box cover lights up and the machine is stopped immediately.</p>
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	<p>The emergency stop button and the magnetic- safety switches are to check on their function periodically.</p>
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Removal of defects:

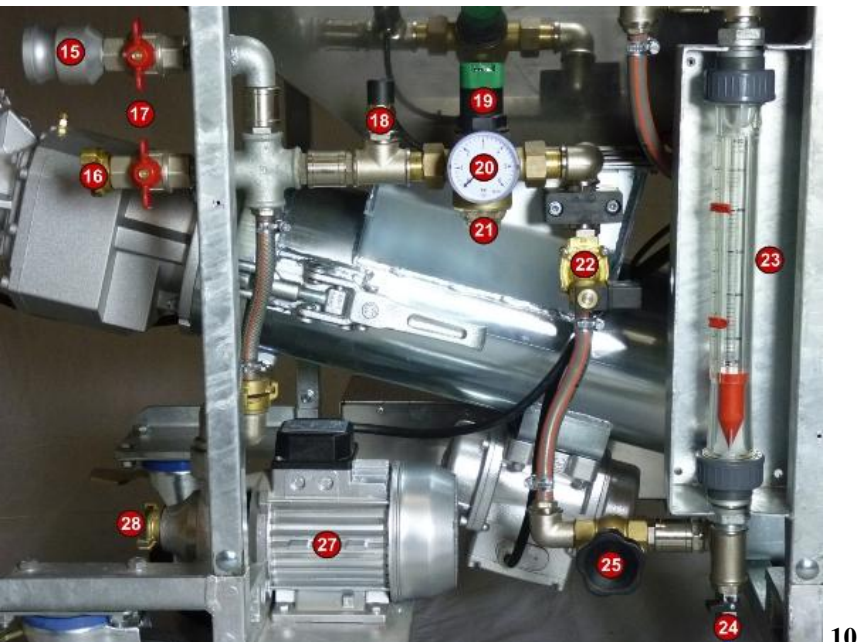


Danger to operational safety

- main switch (10) to "0", (**durch Bogenschloss sichern**) inform the supervisors
- corrective action by authorized personnel

No risk of the operational safety

- disable the machine - rectify the deficiencies - inform the supervisors

8.8 Water system

 <p>10</p>	 <p>11</p>
 <p>12</p>	


15 – hose coupling ID35	23 – water- measuring tube
16 – GEKA- coupling	24 – drain tap
17 – ball valves	25 – dosing valve
18 – pressure switch	27 – water pump
19 – pressure reducer	28 – supply line: water (Geka coupling)
20 – manometer	29 – water- block
21 – filter with more transparent filter holder	29A – seal for water block
22 – solenoid operated valve	30 – water nozzles with stuffing- screw

For trouble-free operation, the machine is to attach at a main- water supply line, with a line pressure of about 2.5 – 4. To check, look at the manometer. (20)

The more water needed for processing the mortar is, the higher must be the water conduit- pressure.

A built-in pressure reducer, (19) (factory set to 2.7 bar) will compensate the slight variations in pressure. Should be a very high water demand are needed during the material- processing, the pressure reducer can be set to a higher value.


If the system- water pressure at work falls down under 1.8 bar, or it fluctuates too much, the machine will be turned off, by the water pressure switch (18).


 Hinweis	Without water pressure, the machine cannot be turned on!
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By the Side of the machine there are two water connections, which can be opened by ball valves (17). At the upper connection is a mortar- hose -quick coupling (15) mounted. There, the mortar hose can be attached upon completion of the work and then be cleaned with the supplied cleaning balls at full water pressure (maybe activate the water pump) to thoroughly.

At the lower connection, a Geka- quick coupling (16) is mounted, which can be used for:

- a water hose (to clean the machine)
- the water extraction or
- the included stodger- ex hose (for eliminate the stodger in the mortar hose).


 Hinweis	If one of the two ball valves opened too far while the machine is on, it can happened that the system- water pressure falls under 1.8 bar and the machine will be turned off.
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 Hinweis	Becomes water taken from the same main water supply line at a different point, it can happen that the water pressure will be vary extremely and the machine will be turned off.
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Water pump (optional)
(booster pump is not self priming)

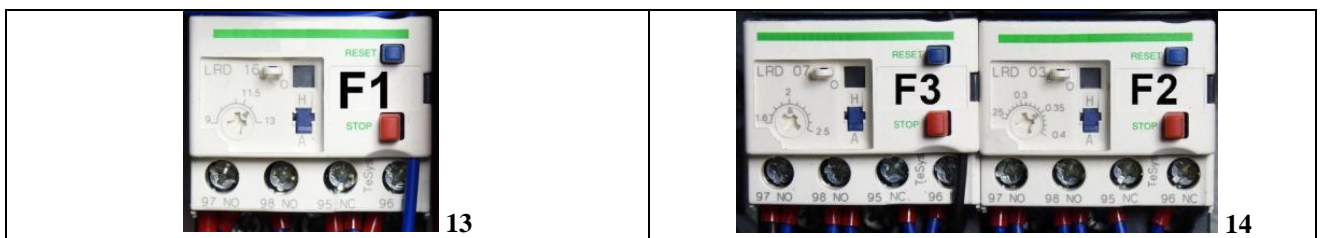
Activate the water pump (27) to increase the pressure, if the system- water pressure is to low; that ensures the function of the machine.

By short starts and stops of the machine, it is recommended the switch "water pump" (3) to provide the "AUTO" position. Thereby the machine switches on and off automatically.
The prerequisite for this is a pressure of 1.8 bar in the main water supply line
If this pressure is not given, e.g. when working with a scuttlebutt, it is manually switched on and off.


 Wichtig	<p>The water pump cannot run for too long without water, otherwise there exists danger of overheating.</p>
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Setting of the motor protection switch in the switch box

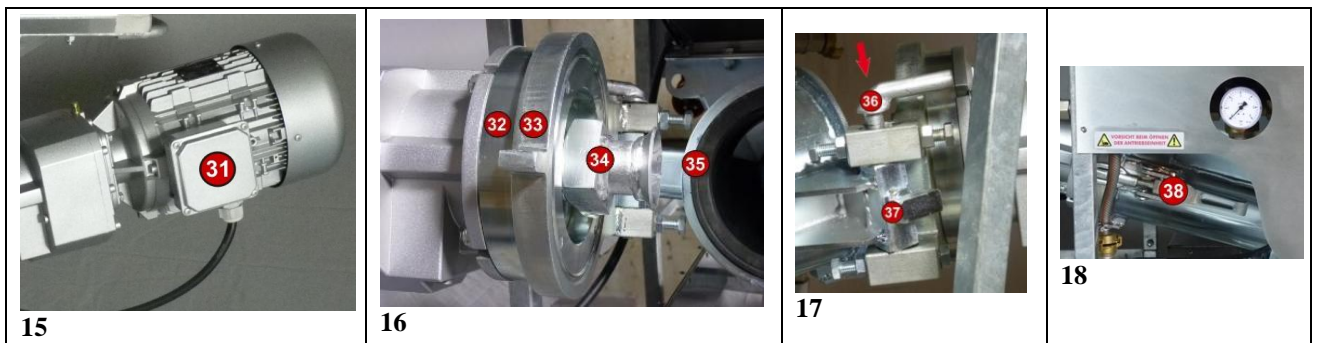
After opening the protection cover with a screwdriver, the control dial is to adjust as follows:



<p>F 1 – mixer motor 12,0A</p>	<p>F2 – vibrator 0,38A F3 – water pump 2,0A</p>
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	<p>The opening of the switch box may be made only by authorized personnel. The power plug must be drawn before opening the cabinet.</p>
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8.9 Drive system





<p>31 – mixer motor</p> <p>32 – labyrinth seal</p> <p>33 – motor flange</p> <p>34 – engine clutch</p>	<p>35 – mixing tube</p> <p>36 – bolt</p> <p>37 – mixing tube holder for motor flange</p> <p>38 – eccentric tensioner</p>
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The drive system consists of the mixer motor, the labyrinth seal, the motor flange and the motor coupling. The drive system is connected by a bolt with the flange- holder on the mixing tube and fastened with the eccentric tensioner.


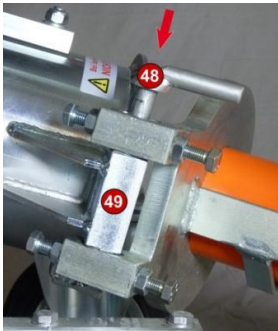

Through individual adjustment possibilities of the screws on motor flange and the threaded- eyelet of the eccentric tensioner, a precise adjustment is possible.

cultivation- description: → [point 9.2](#)

	<p>If the machine is running never open the motor flange or the pump flange, or never start the machine in an open state of one of two. Machine must be secured during maintenance or repair against restarting.</p>
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	<p>Danger of impact when pulling out the plug of the drive unit.</p>
---	--

8.10 Pump system

 <p>19</p>	 <p>20</p>	 <p>21</p>
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40 – pump flange	46 – nut for pump outlet
41 – screw pump rotor	47 – hose coupling
42 – screw pump stator	48 – bolt
43 – pump outlet cleaner	49 – mixing tube holder for pump flange
44 – pump outlet	50 – eccentric tensioner
45 – manometer	

The pumping system consists of pump flange, complete screw pump (rotor, stator and pump outlet cleaner) and pump outlet.


The pumping system is attached by a bolt and an eccentric tensioner on the machine.


Through individual adjustment possibilities of the screws on pump flange and the threaded- eyelet of the eccentric tensioner, a precise adjustment is possible.


cultivation- description: → [point 9.1](#)

Assembling of pump systems


1. Put the screw pump (41+42+43) into the pump flange (40) that you can read the label if you see from the direction of the pump outlet.
2. Then slide the pump outlet (44) with the manometer (45) over the threads on the pump flange (40) and screw the two envisaged nuts (46) gradually crosswise till they are firm.


 Achtung	<p>Please note:</p> <ul style="list-style-type: none"> • The screw pump must be located centrally in the pump flange and in the pump outlet. • damage on the stator • Damage or wear to the recordings recording pump flange / pump outlet keep clean
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 Wichtig	<p>The pump outlet cleaner (43) must be mounted on the square at the end of the rotor of the screw pump; otherwise there will come to damages at the machine by driving backwards of the mixer motor.</p>
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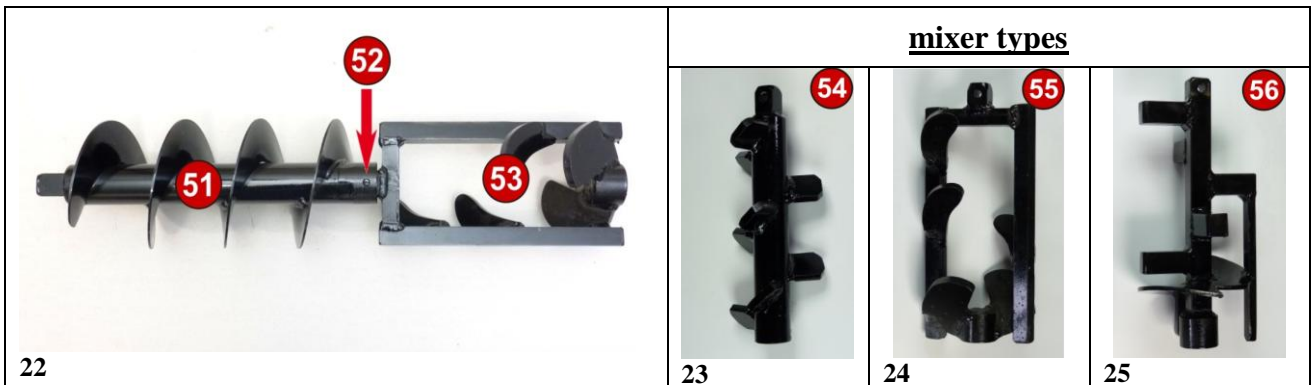
 Achtung	<p>The nuts on the pump outlet only solve if it is guaranteed that there is no pressure at the pump outlet! If necessary, press the yellow button (back driving) as long, until no more pressure in the mortar hose is present.</p>
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The Clever & CO- screw pumps are maintenance free i.e., they do not need to be disassembled and cleaned after completion of work. In compliance with → [point 10.11](#)


 Achtung	<p>Danger of impact when pulling out the plug of the pump system.</p>
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 Hinweis	<p>The screw pump is a wearing part. The durability depends on the flow rate, the mortar hose length, the discharge head, the material properties or maybe through the deadlock of the screw pump by stodger. Therefore, it is advisable not to use more mortar hoses as necessary.</p>
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8.11 Mixing conveyor





<p>51 – steel-screw conveyor</p> <p>52 – split sleeve</p> <p>53 – mixer</p>	<p>54 – mixer „uni neu“</p> <p>55 – mixer „uni fein“</p> <p>56 – mixer „uni therm“</p>
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 Hinweis	<p>The mixing conveyor is a wearing part The durability depends on the run time, consistency, the flow rate, frequent starting and stopping, or maybe through the deadlock of the screw pump by stodger.</p>
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9. Montage of components

- The assembled pump system → point 8.10 slide it about the flange mounting (49) of the mixing tube located, put the pin (48) through (picture: 18) and latch it firmly with the eccentric tensioner (50).
 - The spacing between the pump flange and the mixing tube should amount to 5mm.
 - The adjustment is by the screws on the pump flange and the eccentric tensioner.


 Hinweis	<p>The rotor (of the screw pump) needs to be rotated, with the help of the rotor key (order number 105108), until it stops at the pump output, because the driving unit can't be closed later.</p>
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 Vorsicht	<p>Risk of jamming during the opening and closing of the motor flange and pump flange!</p>
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 Hinweis	<p>At the bottom of the eccentric tensioner is a safety lever. This must be pulled, when it will unlocking.</p>
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 Achtung	<p>The bolts (on the eccentric tensioner) mustn't have a small amount of zero backlash exhibit and not be obsolete!</p>
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1. Push the drive unit (31) over the flange bracket (37) of the mixing tube.
 Push the bolt (48) through (picture: 15) and firmly lock it, with the eccentric tensioner (38).
 - The even spacing between the flanges (33) and mixing tube (35) should to amount to 5mm.
 - The adjustment ensued by the screws on the motor flange and on the eccentric tensioner.


 Vorsicht	<p>The drive unit has a weight of 59 kg. Therefore it is advisable the drive unit with the help of another person, to attach or remove.</p>
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2. Please unlock the flange on the eccentric tensioner and open up the drive unit again.
 → release lever at the eccentric tensioner note
3. Insert the mixing conveyor with the mixer (53) from the motor side into the mixing tube.
 Push it on the pinion square of the screw pump, while you push it, move the mixing conveyor back and forth.
 Push the mixing conveyor till the end of the pinion square of the screw pump.

 Wichtig	<p>The pinion square at the conveying system must be in a serviceable condition and feature no strong signs of wear.</p>
---	--

4. When closing the drive unit, turn the engine clutch (34) with hand in the correct position, close the drive unit and lock it firmly with the eccentric tensioner (38), so that the locking lever snaps.
 - This need to be repeated more often in order to achieve the correct position.
5. Plug the connector from the mixer motor into the socket (13) at the control box.


 ! Gefahr !	<p>Danger of impact when disconnecting the power plug of the driving unit.</p>
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 ! Gefahr !	<p>For safety reasons - when coupling and uncoupling of the modules - put the main switch on position "0".</p>
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
10. Commissioning and operating the machine

10.1 Last control:

- The machine must be positioned firm on a horizontal level.
- The inspection of all connectors, cables, and safety installations.
- Connect the current-carrying cables at the phase inverter socket.
- Check the power connector, master switch (10) to position 1
→ green indicator light illuminates. → point 8.6
- Connect the water- supply hose at the Geka coupling (28) and vent it with the ball valves (at the machine) (17).
- Check of the water connection for leaks.
- Check of the water pressure by the gauge (20) (at least 2.7 bar, at standstill of the machine).
- Check of the correct assembling of the pump systems. → point 8.10
- The tightening nuts (46) of the pump outlet (44) must be tightened
- Check if the flanges of the motor and the pump, by the eccentric tensioner (38 +50), firmly clamped and the safety lever is engaged.


	<p>Risk of jamming during the opening and closing of the motor flange and pump flange!</p>
<p>Vorsicht</p>	

- The mortar hose must have no leakiness even at the joinings and it must be well watered and lubricated.
- Is the grid properly on and is the magnet (B) located before the safety switch? → point 8.7

	<ul style="list-style-type: none"> • The machine can be operated only with the grid for security reasons. • The machine stops immediately if the grid is raised up during the operation.
<p>Wichtig</p>	

10.2 Test run of the water injection

1. The switch "operation" (3) to position → **O**
2. Push button GREEN (1) hold for about 10 seconds

	<p>After pressing the push button GREEN, the system- water pressure must be at least 1.8 bar, otherwise the water column can't be adjusted.</p>
<p>Wichtig</p>	

3. Now, adjust the amount of water at the water-dosing valve (25). You can read it at the upper edge of the float of the water- measuring tube (23)
 - CW rotation: less water
 - CW rotation: more water

Pressure test of the performance of the screw pump

The screw pump can be tested in test mode (with water) about their performance, by a pressure tester (order number 105102).


This test gives the user informations about how far or how high the material can be promoted.

10.3 Manual operation in the test run


1. The toggle switch "operation" (3) to position → **HAND**
2. Press the pushbutton GREEN (1)
→ Machine runs
3. Test the function of the vibrator (optional) and of the water pump (optional) with the appropriate switches (5/4).
4. The pointer in the manometer (20) should stand between 2 and 2.2 bar with running machine.
5. For functional testing of the pressure switch (18), the water-supply hose can be bent for testing purposes. The machine must switch off under a pressure of 1,7 bar.
6. After a successful trial run, switch off the engine at the red stop button (2).


10.4 Manual operation under working conditions

1. The toggle switch "operation" (3) to position → **HAND**
2. Press the pushbutton GREEN (1)
→ Machine runs

 Hinweis	<p>In the processing of unknown materials, it is advisable to begin with a high water- injection and then to decrease it as long until the desired consistency of the mortar is achieved. If the required amount of water is known, it can be set the same.</p>
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3. Put a sack of mortar (of the material to be processed) on the grid, - tear the sack gently open with the prongs of the bag opener, let the material slowly trickle into the funnel, by degrees add more material.

 Wichtig	<p>A too rapid filling of the material can lead to a blockage in the mixing chamber.</p>
---	--


 Hinweis	<p>At the pump outlet now enters a water - mortar mixture from, however, this could have one to high or a to low water content.</p>
---	---

4. By turning the wheel at dosing valve (25), may now the consistency of the mix-material, in compliance with the water injection (23), be set
 - CW rotation: mix-material will firmer

- CCW rotation: mix-material will fluid

 Hinweis	<p>Reducing of the amount of water must be done in several steps, because waiting times are to be observed, until the new mix-material tread out at the pump outlet.</p>
---	--

5. The amount of water is to reduce as much, or raise until the desired consistency tread out at the pump outlet.

 Wichtig	<p>The values of the water-cement mixture of the manufacturer are to note during the processing of mortar.</p>
---	--

6. Is the correct mortar consistency (mixing time for at least 10 seconds) adjusted; the mortar-mixing pump can be switched off with the red STOP button (2).


10.5 Stodger in the screw pump

1. After turning off the machine, activate the automatic reverse (9) short.
If the mixer motor does not rotate and hum, the nuts from the pump outlet (46) can be slightly resolved, so that the whole screw pump can be rotated by the motor force.
Then, with a short forward and reverse running of the mixer motor, try to solve the rotor inside the stator.
2. After troubleshooting start the machine again. → point 10.4



At unsuccessful action

3. Remove the screw pump from the pumping system and try with the help of the rotor key (order number 105108), to unscrew the rotor out of the pump.
4. Clean the hopper and the mixing tube.
5. After the parts are cleaned thoroughly, you have to coat again the rotor with silicone grease or spray and screw it into the stator.


10.6 Working with the vibrator (optional)

	<p>58 – vibrator</p>
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For avoidance of material hollow spaces in the hopper, we have installed a vibrator (58) under the mixing tube. The vibrator can only be switched on, with the selector switch (5) with the machine running.

 Hinweis	<p>To avoid unnecessary noise, It is advisable to turn on the vibrator only when to need.</p> <ul style="list-style-type: none"> • 75 db in the off state • 90 dB in the on state 	
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10.7 Working with the remote control (optional)


 Wichtig	<p>Before the Clever & CO may be operated in automatic mode, are all work instructions, as described in point 10.4, to be followed.</p>
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
1. The switch "operation" (3) to position → **0**

 Vorsicht	<p>Before connecting the remote control at the switchbox, the tamperproof safety switch of the cable remote must be pressed.</p> <p><u>Switching states:</u></p> <ul style="list-style-type: none"> • pressed → machine off • unlocked → machine on
--	---

2. Bolt together the remote control with the connector (7).
3. The switch "operation" (3) to position → **AUTO**
 - Now the machine can be switched on and off, with the remote control.


 Hinweis	<p>For the automatic switching (on and off) of the water pump, the switch "water pump" (4) must be turned on position → AUTO. Hereby, the water pump can be switched via the remote control.</p>
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 Wichtig	<p>The starting of the machine and the filling of the hoses should be executed always in HAND-Operations.</p>
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 Wichtig	<p>The Clever & Co CL 06 must be operated in automatic mode by two people. A person must remain for safety reasons and for filling the machine.</p>
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10.8 Working with the mortar hose


1. After controlling the mortar- hoses and couplings on damage or wear, they must be rinsed with water and emptied again.
2. Fill the hoses with about 0.3 l lubricant and connect them with the quick coupling (47) of the pump-outlet of the dormant machine.

 Hinweis	<p>The coupling of the hoses should be performed immediately after turning off the machine, otherwise the mixed material inside the pump outlet can thicken and that can lead to avoidable stodger in the mortar hoses.</p>
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 Hinweis	<p>To prevent stodger, it is advisable (for the most materials) to couple the next mortar hose if the material take the right consistency when leaving the hose.</p>
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3. Now the same procedure as in [point 10.4](#).
→ Machine runs
4. Observe the pressure gauge (45) at pump outlet.


 Achtung	<p>If there a sudden increase of pressure, stop the engine immediately with the red STOP button or the emergency stop button</p> <ul style="list-style-type: none"> • stodger in the mortar hose → point 10.10
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 Hinweis	<p>For some materials, it is advisable to turn off the machine every 5 - 10 seconds and after a short time turn it on again. Thereby there is no high pressure inside the mortar hose at the beginning of work and thereby decreases the stodger-risk.</p>
---	--

5. Observe the mixed material at the end of the hose and after a short time increase or decrease the amount of the supplied water through the dosing valve (25).


 Hinweis	<p>After the changes in the amount of the supplied water, it takes some time until the new mixing ratio will be come out at the end of the hose.</p>
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6. After the right consistency of the mortar in the mortar hose, turn off the machine (2) and take the mortar hose to the place of work.


 Hinweis	<p>By increased solar radiation (summer) on the mortar hose the setting time of the mix will be shorten.</p>
---	--

10.9 Work interruptions and breaks

It is better to avoid long pauses during pumping, because the mix in the mixing unit and transport unit of the machine and in the mortar-hose can thicken.


 Hinweis	<p>If a longer pause cannot be avoided, the machine should be often turned on for a short time during the pause, to transport at least a portion of the fill volume of the mixing chamber (or of the mortar-hoses). In this way there can be reduced stodger inside the machine or the mortar-hoses.</p>
---	--


 Hinweis	After some lengthy pauses observe the pressure gauge (44) and stop the machine again near by 30-35bar (depending on the nature of the screw pump). Wait until the pressure gauge shows approximately 10-15bar and start the machine on again. Repeat this procedure until the pressure gauge stabilized. → After a short time, the pressure inside the mortar hose will be on the primordially value.
---	--

 Achtung	If you notice a sudden increase of pressure on the pressure gauge (44), stop the machine immediately with the red STOP button or the emergency stop button. <ul style="list-style-type: none">• stodger in the screw pump → point 10.5• stodger in the mortar-hose → point 10.10
---	---


If the mix inside the hose is thickened at beginning of work, the set amount of water must not be altered in this case, because the preset mortar consistency will be quickly re-established after short time.

Pauses last longer than 30 minutes should be avoided because it can lead to significant cleaning time.


 Wichtig	It is absolutely important to observe the setting times and curing times of the mortar-manufacturer.
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 Hinweis	After prolonged standstill of the machine, the rotor and the stator of the screw pump must be disassembled and cleaned. The rotor and the stator must be greased with silicone grease or spray and are then reassembled.
--	---

10.10 Stodger in the mortar hose

 Achtung	If you notice a sudden increase in pressure on the pressure gauge (pump outlet), stop the machine immediately with the red STOP button or the emergency stop button.
---	--


1. Press again the automatic reverse (9) briefly, until the pressure gauge (45) at pump outlet falls against zero.
 - The screw pump is running backwards and sucks the material out of the hose.
2. By the bend of the mortar hose you can test if the hose is without pressure.

 Hinweis	Will be the auto-reverse down too long, wet material is led into the drying zone.
---	---


3. The stodger-point can be eliminated by moving back and forth movement of the mortar hose, by gently tapping with a hammer or with the ultimate Stopferex hose.
4. When the stodger is removed, the machine can be switched on again, in compliance with [point 10.4](#).
5. After complete emptying and cleaning of the mortar hose proceed like as described in [point 10.8](#).

10.11 End of work and cleaning


1. Start the Machine as described in [point 10.4](#) and pump the remaining mortar out of the hopper and the mixing chamber.
2. Increase the Injected amount of water (23) to about 400 to 500 l / h and let it run as long until clean water come out at the end of the hose.
3. Stop the machine (2).

 ! Gefahr !	Before any disassembly of the mortar hose or the removing of the screw pump, <u>is to check that no pressure is at the pressure gauge at the pump outlet!!!</u>
---	---

4. Decouple the mortar hose from the quick coupling of the pump outlet (47).
5. Press the matching rubber ball into the female part of the mortar hose.
6. Connect the mortar hose with the Quick coupling (15).
7. Turn up the upper ball valve (17) and let run the water as long till the rubber ball come out at the end of the hose (switch on the water pump (4) possibly). Repeat this process once or twice, until the mortar tube is clean from the inside.
8. Switch the automatic reverse (9) briefly, to make it easier, to open the drive unit (19) and to dismount the pump flange (40).
 - As a result, the rotor of the screw pump rotates, until the stop at the pump outlet.
9. Put the main switch (10) on position "0" and use a padlock against accidentally startup, disconnect the power plug from the phase inverter (14).
10. The drive unit (31) and the pump system (40) opened by eccentric tensioner and fold down.
 - Note the safety lever on the eccentric tensioner

 Vorsicht	Risk of clamping, during start-up and dismantling of: <ul style="list-style-type: none"> • drive system • pump system
--	---

11. Remove the mixing conveyor (point 8.11) and clean the mixing tube with water and the hand brush (cleaning scraper with water connection – order number 700600).
12. The pump outlet (44), screw off and rinse well.
13. Clean the entire machine of mortar and then reassemble.

 Achtung	The Clever & CO mortar mixer pump corresponds to the type of protection IP 44 according to DIN 40050 and cannot be cleaned with water jets.
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**Hinweis**

To ensure the longevity of the machine, please note the following things:

- thorough cleaning of all parts that come in contact with mortar
- strict compliance with the operating instructions
- avoidance of inappropriate treatment

11. Frost risk


1. Put the main switch (10) to position – 0 –.
2. Remove the current-carrying cable.
3. Put the selector switch "operation" (3) to position – 0 –.
4. Interrupting the water supply of the cleaned machine.
5. Decoupling the water hose.
6. Open the shut-off valve (24) of the water-measuring tube and the Geka- ball valves (17) at the machine.
7. The water system, if possible, blow out with compressed air.
8. Clean the Mortar hoses, water supply hose and all other parts from the residues of water.


**Hinweis**

The water measuring tube must be completely empty, since it can be destroyed by frost.

12. Transport

1. Put the main switch (10) in position – 0 – and lock it, use a padlock against accidentally startup
2. Lock down the parking brake of the steering wheels.
3. Check and lock the eccentric tensioner (38) of the mixer motor.
4. Check and lock the eccentric tensioner (50) of the pump flange.
5. Attach the grid with tension cables.
6. All parts must be mount, screwed and secure.
7. Secure the machines against slipping or rolling off.
8. The machine must be transported in a horizontal line by crane.
→ Weight of the engine note (stern-heaviness).


	<p>Danger of tipping over when loading and unloading the machine.</p>
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	<p>The handles on the Machine are not designed for transport with a crane.</p>
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13. Maintenance

To ensure the long-term function of Clever & CO mortar mixing pump, it is necessary to undergo the machine at regular intervals a maintenance.

- Keep the cooling fins and the fan grill of the motors clean.
- Incurred moisture in the electrical sector (motor terminal box, control box, etc.), must be resolved by an authorized and qualified electrician.
- After 150 hours, at the latest after 1 year must a gearbox oil change done and the labyrinth seal of the mixer motor be changed.
- Wear parts, such as steel-screw conveyor, mixer, motor coupling and screw pump should be checked before each start of work (the square of the individual components must be free of wear marks).
- The threads of the eccentric tensioner, from the mixer motor and pump flange, must be greased at regular intervals. The threads on the retaining bolts from the lever are allowed to have only a small amount of play and not be knocked out.

	<p>The machine must be secured against restarting during maintenance or repair work.</p>
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	<p>The machine and the electrical system are to check at least once a year (by expert personnel or the Clever & CO LLC) on their mechanical and electrical state.</p>
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14. Troubleshooting

Type of fault:	Cause and troubleshooting:
<p>rotary field- examiner: red light is lit:</p>	<ul style="list-style-type: none"> • Incorrect direction of rotation <ul style="list-style-type: none"> ○ Change direction of rotation at the phase reverse switch → point 8.6 ○ Rotary field- examiner faulty

<p>rotary field- examiner: both lamps lit</p>	<ul style="list-style-type: none"> • phase missing <ul style="list-style-type: none"> ○ feed line or current distribution of construction sites checked by qualified personnel <p>rotary field- examiner defective</p>
<p>rotary field- examiner: no light shines</p>	<ul style="list-style-type: none"> • no power <ul style="list-style-type: none"> ○ turn on the main switch (10) ○ feed line or current distribution of construction sites checked by qualified personnel ○ rotary field- examiner defective
<p>screw pump deadlocked</p>	<ul style="list-style-type: none"> • wrong material only use mortar for machine use! • not enough water or strong pressure fluctuations → point 8.8 <ul style="list-style-type: none"> ○ check the feed line on defects or other users ○ check the Water quantity and if need increase → point 10.4 ○ try to loosen the screw pump, by short forerun and rewind of the machine → point 10.5
<p>red signal lamp lights up</p>	<ul style="list-style-type: none"> • motor protection breaker has tripped The contactor will turned on, independently again <u>on overload</u> after about 1 min. <ul style="list-style-type: none"> ○ search for the cause of overload • automatic grid has triggered → point 8.7 <ul style="list-style-type: none"> ○ grid not on right place or ○ magnet is not directly in front of the safety switch • EMERGENCY STOP button has triggered → point 8.7 <ul style="list-style-type: none"> ○ after eliminate the risk unlatch
<p>drive unit water pump vibrator remote control: do not work</p>	<ul style="list-style-type: none"> • drive unit or remote control is not plugged in • cable, or connected aggregates are damaged <ul style="list-style-type: none"> ○ checked by qualified personnel
<p>The main fuse in the feed line or current distribution of construction sites triggers:</p>	<ul style="list-style-type: none"> • Moisture in one of the junction boxes of water pump, of vibrator or of mixer motor <ul style="list-style-type: none"> ○ checked by qualified personnel • power cable is defective <ul style="list-style-type: none"> ○ checked by qualified personnel
<p>screw pump does not promote or mix - consistency varies greatly: "thick - thin-effect"</p>	<ul style="list-style-type: none"> • too little water • unsuitable material <ul style="list-style-type: none"> ○ only use mortar for machine use! • pressure regulator wrong adjusted or dirty → point 8.8 <ul style="list-style-type: none"> ○ check the pressure regulator • stator and / or rotor are outworn (41 +42) (wear parts) <ul style="list-style-type: none"> ○ carry out pressure testing of the screw pump with water ○ pressure tester for screw pumps (item no.: 105 102) ○ replace worn or defective parts • rubber-armoured conduit reinforced dirty or defective <ul style="list-style-type: none"> ○ lack remedy • mixer is outworn <ul style="list-style-type: none"> ○ replace worn or defective parts

	<ul style="list-style-type: none"> • too many mortar hoses attached <ul style="list-style-type: none"> ○ do not use more mortar hoses as you need • the dry material does not flow right <ul style="list-style-type: none"> ○ cavity formation in the hopper → point 10.6
<p>mortar flow has dropouts</p>	<ul style="list-style-type: none"> • unsuitable material <ul style="list-style-type: none"> ○ only use mortar for machine use! • mixer or motor clutch is worn or defective <ul style="list-style-type: none"> ○ replace worn or defective parts • rubber-armoured conduit reinforced dirty or defective <ul style="list-style-type: none"> ○ mixing tube clean or renew • incorrect mixer or screw pump <ul style="list-style-type: none"> ○ grain size heed ○ replace worn or defective parts
<p>pump will not start:</p>	<ul style="list-style-type: none"> • cable is too long or does not carry voltage → point 8.5 <ul style="list-style-type: none"> ○ rotary field- examiner control ○ control the main switch at the electric control box • cable cross-section of the cable too low • the water pressure is too low or fluctuates greatly → point 8.8 <ul style="list-style-type: none"> ○ water pump switch on • the grid is not correct on the hopper → point 8.7 <ul style="list-style-type: none"> ○ support edges dirty from the hopper? • magnetic safety- switch is defective (A+B) <ul style="list-style-type: none"> ○ replace worn or defective parts • water pressure- switch defective (10) <ul style="list-style-type: none"> ○ replace defective parts • power switch is not put at AUTO or MANUAL (3)
<p>pump starts and stops again immediately:</p>	<ul style="list-style-type: none"> • the water pressure is too low or fluctuates greatly → point 8.8 <ul style="list-style-type: none"> ○ water pump switch on (4) • stodger in the screw pump → point 10.5
<p>pump starts and the engine hums:</p>	<ul style="list-style-type: none"> • blockade of the mixer, of the screw pump or a stodger in the hose • one phase is missing in the cable → point 8.6 <ul style="list-style-type: none"> ○ rotary field- examiner control
<p>pump stops and the red fault lamp lit:</p>	<ul style="list-style-type: none"> • drive motor, vibrator or water pump are overloaded The relay has stopped the machine. Wait until the fault lamp goes off and try to start the machine again. <ul style="list-style-type: none"> ○ cooling fins of the engines are to check on pollution • mix to dry <ul style="list-style-type: none"> ○ increase amount of water • EMERGENCY STOP - button or the magnetic safety switch has tripped • not suitable material

<p>the main fuse in the supply line or current distribution of construction sites has triggers:</p>	<ul style="list-style-type: none"> • moisture in one of the junction boxes of water pump, of vibrator or of mixer motor <ul style="list-style-type: none"> ○ checked by qualified personnel • power cable is defective <ul style="list-style-type: none"> ○ checked by qualified personnel
<p>stodger in the mortar hose:</p>	<ul style="list-style-type: none"> • hose kinked or not cleaned • mix to dry, strong fluctuations in water • screw pump is worn out (41+42) → point 8.10 <ul style="list-style-type: none"> ○ If the stodger can not remove, the hose must be disconnected and then be cleaned with stodger-ex and cleaning- ball.
<p>stodger in the screw pump:</p>	<ul style="list-style-type: none"> • mix to dry <ul style="list-style-type: none"> ○ increase amount of water (23) • to rapid filling of the hopper at the "starting" → point 10.5
<p>water injects in the machine when the machine is turned off:</p>	<ul style="list-style-type: none"> • solenoid valve dirty or defective (22) <ul style="list-style-type: none"> ○ solenoid valve disassemble and clean ○ replace defective parts ○ control the water supply for dirtying
<p>water column at the water meter- tube cannot be adjusted:</p>	<ul style="list-style-type: none"> • solenoid valve dirty or defective (22) <ul style="list-style-type: none"> ○ solenoid valve dismantle and clean, replace if necessary • solenoid defective <ul style="list-style-type: none"> ○ testing: The solenoid valve, turning on the machine, hold (feel whether the solenoid valve switches) • injector (s) clogged (30) <ul style="list-style-type: none"> ○ Remove the two mounting nuts of the water- block (29) on the mixing tube and clean the water injector (s).
<p>motor or pump stator are overheat:</p>	<ul style="list-style-type: none"> • Heavy pumpable mortar <ul style="list-style-type: none"> ○ manufacturer's instructions ○ visual inspection of the dry mortar ○ Is the mortar granulation suitable for auger pump? • water injection is too low (23) <ul style="list-style-type: none"> ○ increase amount of injected water at the dosing valve • too many mortar hoses are connected <ul style="list-style-type: none"> ○ no more mortar hoses use as necessary • mortar hose kinked or dirty