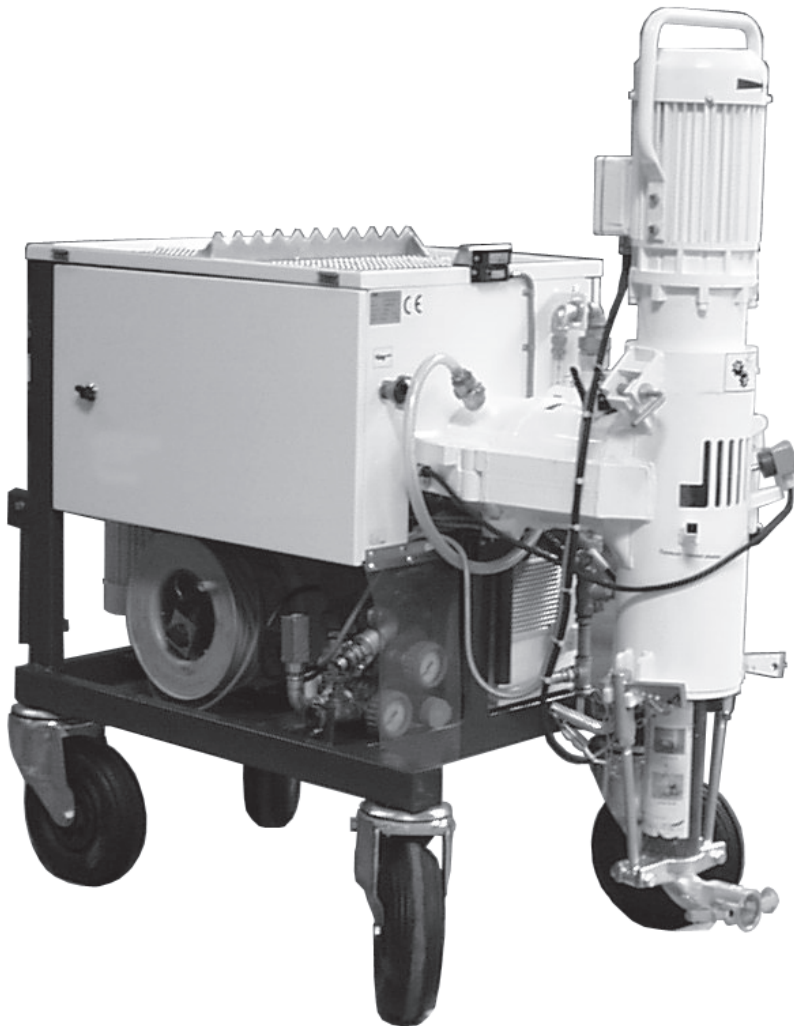


Operating Instructions

Mixing Pump duo-mix 2000-si / FE 50



Dear Customer,

this machine represents the most up to date technology and complies fully with general standards and EEC guidelines. This is indicated by the CE symbol and the enclosed declaration of conformity in the pocket on the machine.

Before starting the machine for the first time, please remove the declaration of conformity from the pocket and keep it in a safe place.



Before commissioning the machine, please complete the form below. This is the easiest way to familiarise yourself with the most important machine data, and to have them ready at all times without having to refer to the rating plate on the machine. If you wish to contact us at any time, please have the information on this page ready. The data you require can be found on the machine plate.

Type _____

Machine no. _____

Year of manufacture _____

Power supply _____

**Rated current
(total)** _____

Date of commissioning _____

Application _____

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1 Safety



This machine has been designed and built using the latest technology and has left the factory in perfect condition. However, it may be dangerous if used incorrectly, for the wrong purpose, or by untrained personnel. For this reason, all persons involved in operating the machine must read and understand the operating instructions, (in particular the section entitled "Safety"), and familiarise themselves with its operation before starting it up. This prevents damage and injury and ensures efficient operation of the machine.

These Operating Instructions must always be kept in the special pocket on the machine so that the user can consult them at any time.

It is prohibited to make any changes or alterations to the machine. Use only spare parts and lubricants approved by m-tec mathis gmbh.

1.1 Symbols

The following symbols are used in these Operating Instructions:

Warning!

This symbol is used to indicate risk of personal injury. Always observe these warning instructions carefully. Pay particular attention to the safety of other persons in the vicinity of the machine and its components.



Attention!

This symbol indicates possible danger to material and machine. Observe these instructions to avoid damage to property.



Do not touch!

Warning on moving or rotating parts. Do not put your hands into the machine when it is in operation!



Environment!

This symbol indicates that environmental regulations must be complied with.



Info!

This symbol precedes additional information which may be useful or helpful to the user.



1.2 Safety notes



When transporting, assembling, dismantling, operating, cleaning, and servicing the machine, the applicable national and international safety regulations and legislation must always be observed, even if such regulations and legislation are not explicitly mentioned in these instructions.

The duo-mix 2000-si / FE 50 is monitored by means of a safety system consisting of magnetic safety switches and monitoring center. However, always observe the following notes additionally:

- Before working on the machine's electrical system, remember to remove the plug from the power supply, as certain components remain live even when the machine is switched off.
- Modifications to the machine are prohibited. Use only spare parts and accessories supplied by m-tec mathis technik gmbh. If spare parts and accessories of other types are used, m-tec mathis technik gmbh will assume no liability for damage caused.

The machine must be

- positioned firmly on a level surface. It must be secured to prevent it from tilting or moving.
- positioned in an area where no objects can fall onto it from above. If this is not possible, it must be protected by a safety guard.
- positioned in such a way that all the operating elements are easily accessible at all times.
- The machine is fitted with a frequency inverter. After switching the machine off at the main switch, it must remain off for at least 30 seconds (e.g. after work or malfunction). If the machine is switched on again after less than 30 seconds, the frequency inverter may fail to function properly.

- Use only mortar hoses with a permitted operating overpressure of 40 bars and a bursting pressure of at least 120 bars.
- We recommend installing a hose-pressure gauge. This allows the pressure in the mortar hoses to be monitored at all times.
- To avoid blockages, the mortar hoses must be lubricated with slurry before use.
- When blockages occur, switch the machine off at once at the "Off" switch.
- Always depressurise mortar hoses before uncoupling them. Before opening, cover the coupling with a tarpaulin. Wear regulation goggles and do not face the coupling directly, as material may spray out.
- The machine must be connected to a regulation site distributor box with FI automatic circuit breaker and fuse protection of at least 25 A. The connection cable must have a cross section of at least 5 x 4 mm² and a connection coupling of 32A 5 pole 6h.
- Before every shift, the machine must be carefully inspected for obvious signs of damage, in particular to electric cables and plugs. Any damage must be repaired before beginning work.
- Do not remove the safety grid when filling the machine with bagged material. Do not put your hands into the material trough. Do not place any objects in the material trough.



- When the machine is switched off via the remote-control cable drum, it is still on standby and can be started again at any time by pressing the switch on the cable drum. Indication: in mixer-pump mode, "5" appears in the display.

For the sake of simplicity, the following sentence is used to refer to the above-mentioned safety note:

If the machine is switched off remotely, it remains on standby and can be switched on again remotely at any time. This is indicated by "5" in the display.

- The table "Troubleshooting" is not intended to replace the detailed instructions in the individual sections of the Operating Instructions. Always observe the safety notes in the sections concerned.
- Keep the mortar hoses as short as possible. Hoses which are too long put unnecessary load on the spiral pump and cause excessive wear. Lay out air and mortar hoses in a straight line from the machine to the work area.
- Always dispose of mortar residue in accordance with the regulations for building waste.
- The maximum operating pressure of the water pump (10 bars) must not be exceeded.
- When the filling funnel is installed, the spiral pump is not protected against running dry!
- Material adhering to the wet-mortar probe must be removed every two or three hours. When removing the probe, take care not to damage the insulation on the contact rod.
- During breaks in work, remember the time required for the material to set. The material sets more rapidly at high temperatures.
- Under sub-zero conditions, water fittings may be damaged if allowed to freeze. For this reason, all parts of the machine containing water should be completely emptied before longer interruptions in work.

- Do not empty slurry into the material trough.
- The conical end on the mixing shaft and the sleeve on the feeder screw must be absolutely clean and dry before they are assembled. Never grease them, as this makes it impossible to release the mixing shaft from the dosing shaft.
- When cleaning the mixing tube, close the feed unit of the machine with the plug supplied to prevent water from entering it!
- The machine must be inspected by a specialist engineer in accordance with applicable safety legislation. It should be inspected at least once per year.
- Overfilling the gear unit and motor with lubricant may cause overheating. Do not mix different types of oil and grease. Disregarding the lubrication instructions may invalidate the guarantee.
- Always observe environmental regulations when disposing of oil, grease or cleaning agents.

2 Description of the machine

2.1 Intended use

The duo-mix 2000-si / FE 50 is a universal mixing pump which can also be used as a continuous mixer (see page 43). In its standard form, it can be used for materials of the following types:

- Masonry mortar
- Floor cement
- Liquid grouts
- Concrete (up to grain size 6 mm)



The use of the machine for any other purpose is prohibited.

2.2 Function

In its standard form, the duo-mix 2000-si / FE 50 is designed for use with bagged material. It can also be used with the following optional accessories:

- with a feeding or filter hood it can be filled with material from a bulk silo

The duo-mix 2000-si / FE 50 is fitted with a safety system. The pump mixing pipe or safety outlet respectively and safety grid are fitted with magnetic safety switches. The monitoring center stops the machine when the pump mixing pipe or safety grid are opened.

The mixer and pump units are driven separately. The mixing section consists of two mixing chambers. In the first mixing chamber, the dry material is added to water and undergoes preliminary mixing. In the second mixing chamber it is thoroughly mixed. This allows homogeneous mixing of even very fine-grained materials.

The material is now ready for use and is removed from the mixer by a spiral pump.

The water supply to the mixing chamber can be adjusted and controlled by a flow meter. A water-pressure gauge switches the machine off as soon as the water pressure is no longer sufficient. If the water pressure supplied is too low, a water pump ensures that the machine continues to operate smoothly.

The level in the pump mixing pipe is monitored by a wet-mortar probe. When the maximum level is reached, the mixer motor and the water pump are switched off automatically (standby). When the minimum level is reached, mixer motor and the water pump are switched on again automatically. This prevents the pump mixing pipe from running over. At the same time, the wet-mortar probe ensures that the spiral pump cannot run dry during automatic operation. If an "Empty" signal is not given within 30 sec. of the "Full" signal, the machine switches off.

As an option, a dry-material probe can monitor the level in the material trough. When it signals lack of material in automatic mode, the mixer motor, the water pump and the pump motor are switched off automatically. After material has been placed in the material trough, the error signal should be cancelled by pressing the Off-button at the double push button "On/Off". The machine can then be switched back on at the double push button "On/Off".

The correct direction of rotation for the water pump, mixer motor and pump motor is monitored and set correctly by the control system. The direction of rotation can be checked by the pump motor cooling fan and at the mixer itself.

The machine also has a frequency inverter to allow the fine adjustment of the pump-motor speed.

The entire machine can be controlled i.e. switched on and off as follows:

- directly via the operating elements on the control panel (see page 18)
- When remote-control cable drum is used

2.3 Machine diagram

Fig. 1: View from left

- 1 Remote-control cable drum (50 m)
- 2 Pump end piece
- 3 Spiral pump (stator incl. rotor)
- 4 Pump mixing tube
- 5 Lock for pump motor
- 6 Pump motor
- 7 Lock for mixing tube
- 8 Mixing tube
- 9 Operating panel (see p. 18)

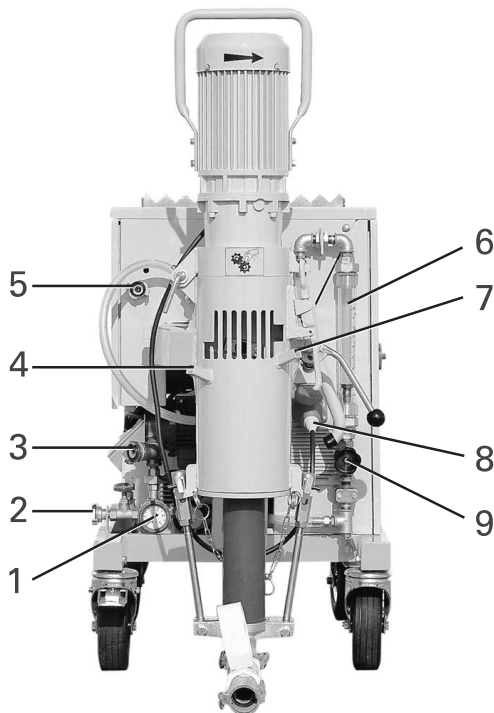
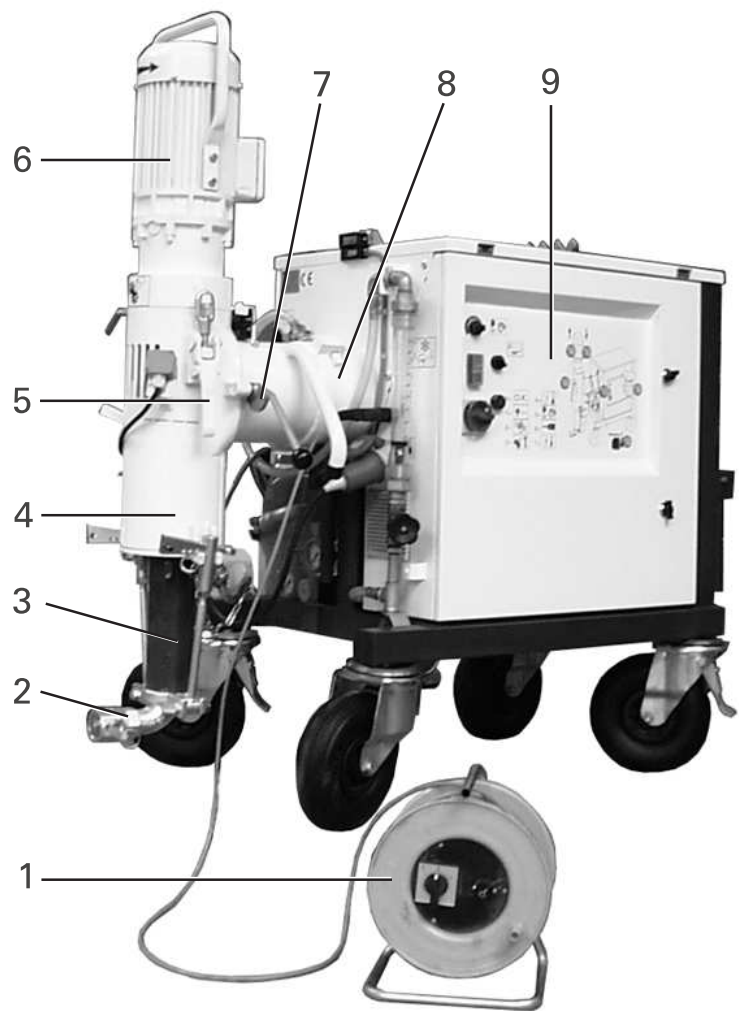


Fig. 2: View from front

- 1 Water inlet pressure gauge
- 2 Cleaning tap
- 3 GEKA-connection, water pump inlet
- 4 Holder 1 for wet-mortar probe
- 5 Connection for compressed-air hose (spraying)
- 6 Flow meter
- 7 Holder 2 for wet-mortar probe
- 8 Power socket, pump motor
- 9 Fine adjustment valve for water flow

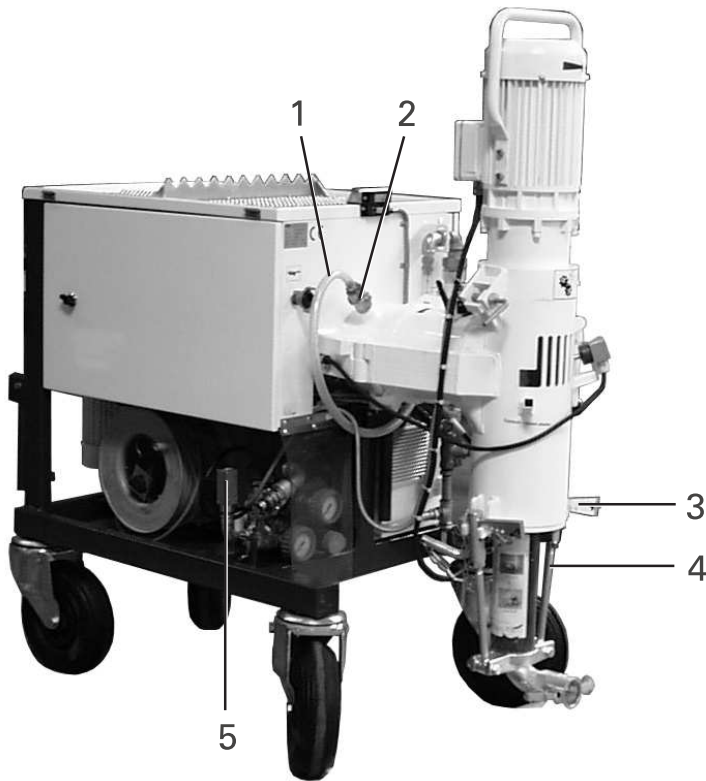


Fig. 3: View from right

- 1 Internal water hose
- 2 Connection for interior water hose on mixing tube
- 3 Tensioning wedge
- 4 Connecting rod
- 5 Water-pressure monitor

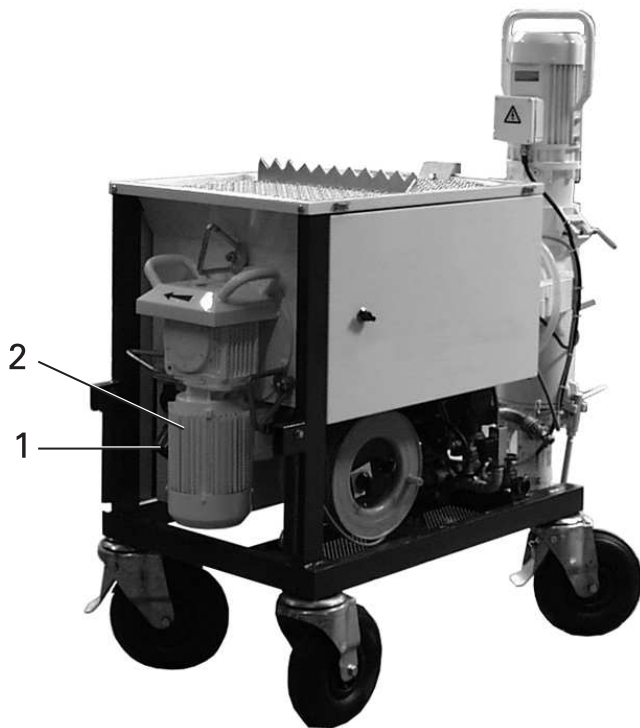


Fig. 4: View from rear

- 1 Machine-supply plug
- 2 Mixer motor

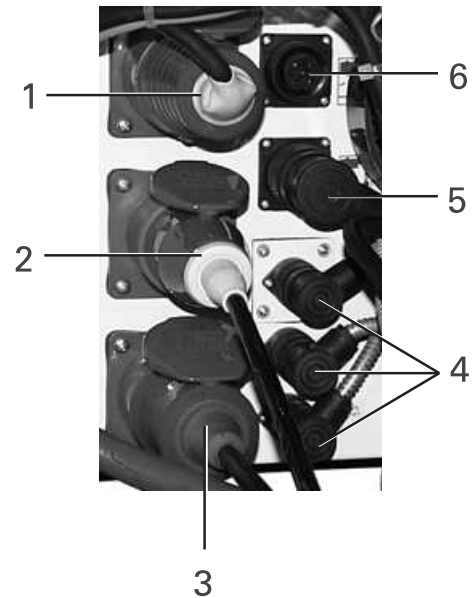


Fig. 5: Interior connections

- 1 Mixer motor connection
- 2 Compressor connection
- 3 Water pump connection
- 4 Magnetic safety switch connection
- 5 Wet-mortar probe connection
- 6 Dry-material probe connection

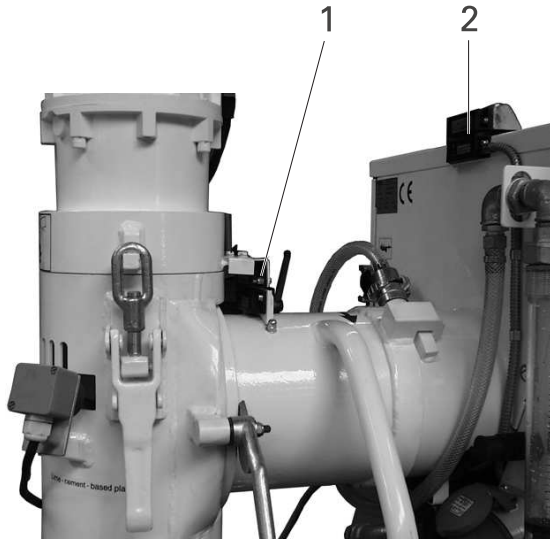


Fig. 6: Magnetic safety switch

- 1 Magnetic safety switch
"Pump mixing pipe"
- 2 Magnetic safety switch "Safety grid"

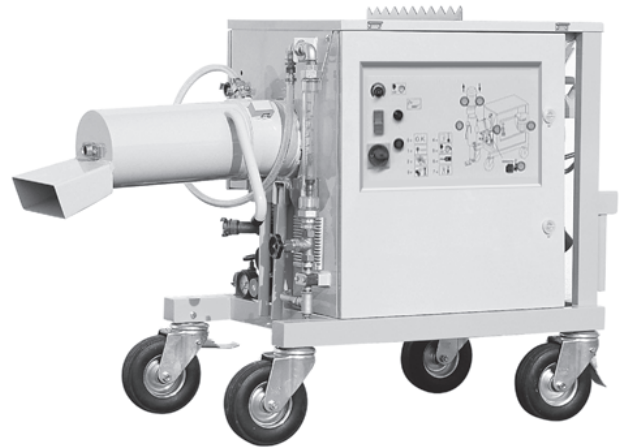


Fig. 7: duo-mix 2000-si / FE 50 as continuous mixer



Fig. 8: duo-mix 2000-si / FE 50 with feeding/filter hood (optional)

2.4 Operating and display elements

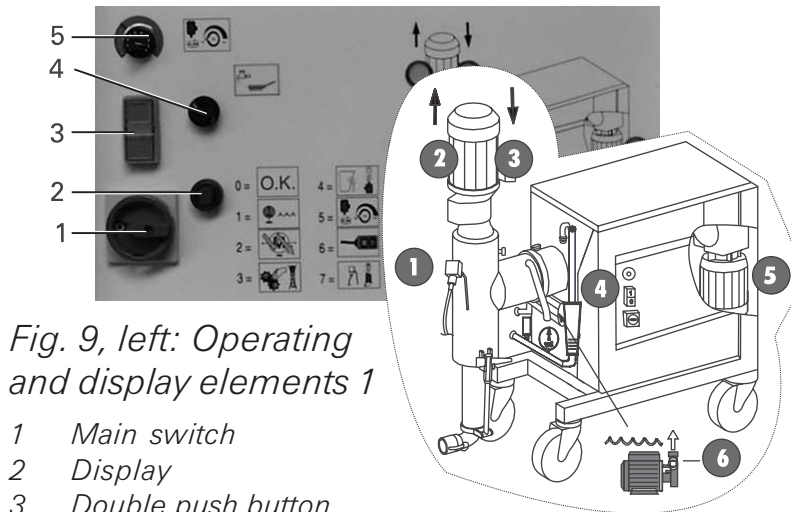


Fig. 9, left: Operating and display elements 1

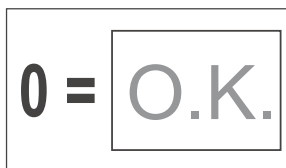
- 1 Main switch
- 2 Display
- 3 Double push button "On/Off"
- 4 Rotating switch "Operation/Cleaning"
- 5 Speed controller pump motor

Fig. 9, right:

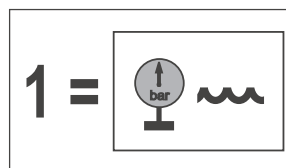
Operating-/display elements 2

- 1 Signal lamp
- 2 Wet-mortar probe, red
- 3 Push button without self-hold "pump motor reverse", green
- 4 Push button without self-hold "pump motor forward", green
- 5 Push button with self-hold "mixer motor", green
- 6 Push button with self-hold "water pump", green

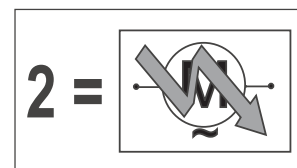
Symbols on the flow chart



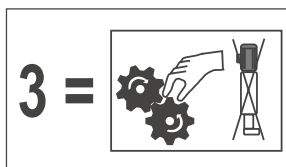
Ready for use



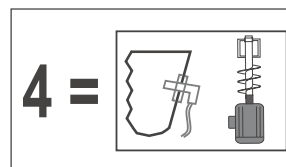
Water pressure too low



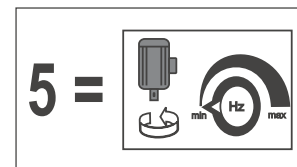
Motor-safety switch has triggered



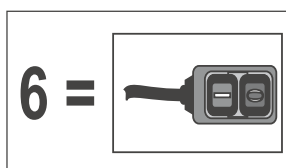
Magnetic safety switch switched



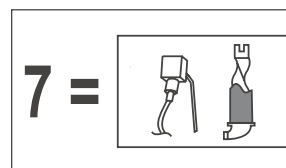
Dry-material probe signals lack of material



Error in frequency inverter



Automatic mode has switched to standby



Wet mortar probe signals "FULL"

Display (fig. 9, 2)

The display is activated when the main switch is at "1" and the "On/Off" switch at "On". The displays "5" and "7" indicate both operating mode and any errors.

Display	Operating status	Fault/error signal
0	The machine is set to standby or in continuous-mix or automatic mode	
1		No water-inlet pressure or too low
2		A motor circuit breaker (Q1-Q5) has been triggered (see "Troubleshooting")
3		Magnetic safety switch on safety grid signals that safety grid not closed, or the magnetic safety switch on the pump mixer motor signals that the lock is not closed, or the magnetic safety switch on the safety outlet signals that the lock is not closed.
4	Option: The dry-material probe indicates lack of material. The machine switches off. Press the green button "Mixer motor" (fig. 9, 5), the machine runs until the button is pressed again.	
5		Fault in frequency inverter (see "Troubleshooting")
5	The machine is in automatic mode and was switched to standby using the remote-control cable drum, i.e. it is not in operation at the moment, but may start again at any time when the switch on the cable drum is pressed.	When a cable drum is in use to extend the remote-control cable: The "On/Off" switch on the cable drum is at "Off". The air fitting is defective.
0...5...0...5...	If the mixer motor is switched off: If 0 and 5 appear alternately, only the pump motor is active	
7	The wet-mortar probe signals "full"; the red signal lamp (fig. 9, 1) lights up. In automatic mode, the mixer motor and the water pump remain switched off until the level in the pump mixing tube is again in the permitted range. Indication: the green push button "Mixer motor" (fig. 9, 5) flashes.	The wet-mortar probe is dirty and must be cleaned. The wet-mortar probe is defective.



ATTENTION!

Main switch (fig. 9, 1)

In position "0", the entire unit is off. In position "1", the internal power supply of the machine is on; i.e. connection sockets and cables are live.

Before doing any work on the machine (adjustment, maintenance etc.) the main switch must be at "0", as certain components may still be live when the machine is simply switched "Off".

The machine is fitted with a frequency inverter. After switching the machine off at the main switch, it must remain off for at least 30 seconds (e.g. after work or malfunction). If the machine is switched on again after less than 30 seconds, the frequency inverter may fail to function properly.

Push button "On/Off" (fig. 9, 3)

To start the unit, press the button "on", and to switch it off after work, press the button "off". When the machine is on standby, "0" appears in the display.



If the machine is switched off remotely, it remains on standby and can be switched on again remotely at any time. This is indicated by "5" in the display.

Rotary switch "Operation/cleaning" (fig. 9, 4)

To run the machine, the rotary switch is at "Operation". When the button "Mixer motor" and "Pump forward" are pressed, the water pump is controlled automatically.

Only the water pump can be switched to "Cleaning". The other parts of the control system are now out of operation.

Pump speed control (fig. 9, 5)

The speed of the pump motor can be continuously adjusted with the "Pump speed control".

Signal lamp, wet-mortar probe (fig. 9, ❶)

The level in the pump mixing pipe is monitored by a wet-mortar probe. When the maximum level ("full") is reached, the mixer motor and the water pump are switched off automatically. The red signal lamp lights up and the display indicates "7". When the minimum level ("o.k.") is reached, the mixer motor and the water pump are switched on again automatically.

The machine is fitted with a "Dry-run safety device" for the pump (rotor/stator). It takes effect when the machine in automatic mode is switched on again from standby, while the wet-mortar probe signals "full". If the wet-mortar probe still does not give an "empty" signal (i.e. probe has no contact), the water pump, mixer and pump motor are switched off. Before the water pump, the mixer and pump motor can be switched on again, the On-button at the double push button "On/Off" must be pressed again.

Push button "Pump motor reverse" (fig. 9, ❷)

This push button changes the direction of rotation of the pump. It is used for example to reduce the pressure in the mortar hoses.

The button "Pump motor reverse" has no self-hold function which means that the pump motor is running in reverse only as long as the button is pressed.

Push button "Pump motor forward" (fig. 9, ❸)

To switch the pump motor on, press the button once. It then lights up. When it is pressed a second time, the pump motor is switched off. The push button is no longer lit up. For automatic operation, the pump motor must be switched on. When the button is pressed, the pump motor starts running in the direction of rotation via the frequency inverter with the speed set on the speed controller "Pump motor".

Button “Set water” (fig. 9, ④)

This push button is used only during start-up or cleaning. The button “Set water” has no self-hold function which means that the water pump is on only as long as the button is pressed. When the “Set water” button is pressed, the water pump starts operation, i.e. the water supply to the mixing tube is opened.

Push button “mixer motor” (fig. 9, ⑤)

To switch the mixer motor on, press the button once. The water pump is switched on automatically. To assure an even material consistency, the water pump switches on first. The mixer motor follows after a delay of 0.5 sec. The buttons ④, ⑤ and ⑥ light up. If the button is pressed a second time, the mixer motor and water pump are switched off in the opposite order. The three push buttons are no longer lit up. For automatic operation, the mixer motor must be switched on.

Push button “Water pump” (fig. 9, ⑥)

To switch the pump on, the button must be pressed once. It then lights up. When it is pressed a second time, the pump is switched off. The push button is no longer lit up.

Automatic operation

For automatic operation, the push button “Mixer motor” and “Pump motor forward” must be pressed. Regardless of the order in which the two buttons are pressed, the pump motor always starts first and the mixer motor follows with a delay of 1 sec. Even when the machine is switched on remotely (via the spraying device or the adhesive gun), the pump motor starts first and then (after a delay) the mixer motor.

Switchable SPC control system

In the standard version, the pump motor starts via the frequency inverter at the same speed as is set on the speed controller "Pump motor".

If the SPC control system is switched on, the pump motor starts at 50 Hz via the power supply and then switches to the motor speed set on the speed controller "Pump motor" after 0.5 sec.

Magnetic safety system with monitoring system

Magnetic safety switches consisting of two magnets are mounted on the safety grid of the material trough, on the pump motor and safety outlet. Each pair of magnets must be aligned parallel to one another so that the coded contacts can signal this to the monitoring center. When two magnets are too far apart, this is detected by the monitoring center and transmitted immediately to the SPS control system. The machine switches off. To run the machine again, it must be switched off at the main switch, and after a delay of 30 secs. be switched on at the main switch again.

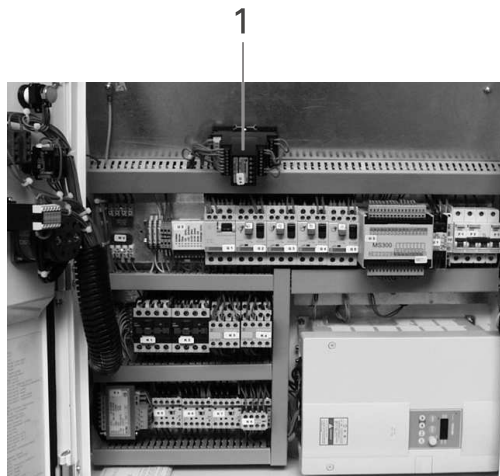


Fig. 10: Open switch cabinet

1 Monitoring center

2.5 Technical data

Weights and dimensions

Dimensions

Length x width:	1350 mm x 640 mm
Height (with pump unit):	1390 mm
Bag emptying height:	1020 mm
Height (with filter hood and bags):	2250 mm

Weight

Complete with accessories:	260 kg
Accessories:	10 kg
Control panel incl.	
Frequency inverter:	20 kg
Pump unit with drive:	67 kg
Small compressor:	22 kg
Mixer motor:	37 kg
Mixing tube/shaft:	9 kg
Bearing weight:	95 kg

Noise level: 79 dB(A); sound-pressure level at 1 m distance, free-field measurement during operation

Mixing unit

Gear motor

Voltage:	400 V
Frequency:	50 Hz
Power:	3.0 kW
Rated speed:	n = 260 r.p.m
Mixing capacity:	approx. 30 l/min. pre-mixed material

Pump unit (without frequency inverter)

Gear motor

Voltage:	400 V
Frequency:	50 Hz
Power:	5.5 kW
Rated speed:	n = 400 r.p.m

The quantity pumped, distance and height depend on the rotors and stators in use, their condition and the material being processed:

Pump capacity for renders and flowing screeds

Quantity:	up to 22 l/min
Distance:	up to 40 m
Height:	up to 30 m
Pressure:	up to 30 bar

Pump capacity for adhesive

Quantity:	10 l/min
Distance:	40 m
Height:	20 m
Max. grain size:	1 mm
Max. permitted pressure:	40 bar

Pump unit (with frequency inverter)

The speed of the pump motor and therefore the pumping capacity can be varied by means of a frequency inverter. By means of the rotation control, the capacity can be continuously adjusted from 1 to 50 l/min. The pumping capacity is dependent on the rotor and stator installed in the pump and on the quality of the material, the pumping height and distance.

Frequency inverter

Voltage:	400 V
Frequency:	10–50 Hz
Capacity control:	up to 7.5 kW
Rated speed, pump motor:	80-400 r.p.m
Pump capacity:	approx. 1–50 l pre-mixed material

Air supply

A compressor is required if plaster rendering is being applied with a spraying unit.

Air pressure monitor

Switch-on pressure: 1.5 bars

Switch-off pressure: 1.8 bars

Pressure monitor, compressor

Switch-on pressure: 2.5 bars

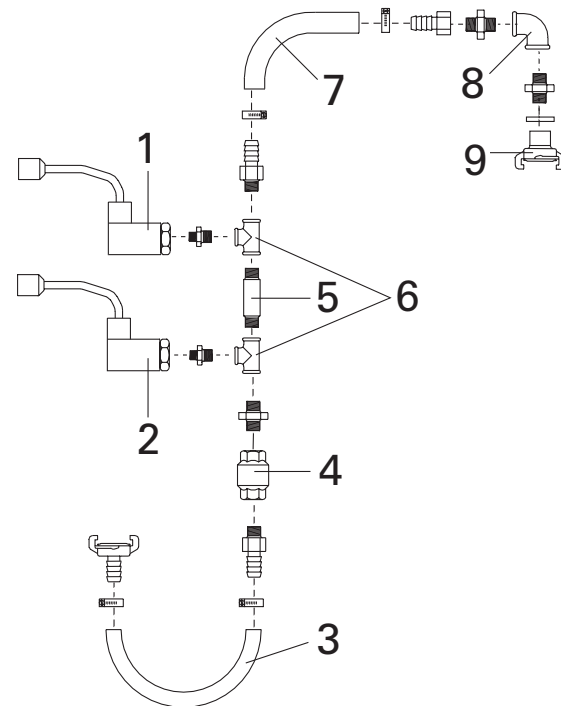
Switch-off pressure: 2.8 bars

Hose connections

1/2" hose with GEKA-coupling

Fig. 11: Air fitting

- 1 Air pressure monitor
0.5 – 8 bar (set to: 1.8 bar)
- 2 Air pressure monitor
0.5 – 5 bar (set to: 2.8 bar)
- 3 Air hose 1/2"; 0,9 m; complete
- 4 Return valve 1/2" internal thread
- 5 Pipe clamp 1/2"
- 6 T-piece 1/2" internal thread
- 7 Air hose 1/2"; 0.3 m; complete
- 8 Angle 1/2" internal thread
- 9 GEKA coupling 1/2" internal thread



Water supply

The maximum operating pressure of the water pump (10 bars) must not be exceeded.

ATTENTION!

The machine requires a constant water pressure of 2 bars. The pressure reducer limits higher mains pressures to this figure. If the mains pressure is lower, a constant water pressure of 2 bars is generated by the water pump. The water pump is located beneath the material trough on the machine. If the water pressure drops below 2 bars, the pressure-monitoring device switches the machine off automatically.

If an adequate flow of water is not possible from the public supply, a barrel of sufficient volume (approx. 200 l) can be placed beside the machine. In this case, the water must then be pumped by the machine water pump or by an external water pump to the machine through a hose. The hose must be vented beforehand.

Water pressure monitor

Range:	1–16 bar
Switch-on pressure:	2.5 bars
Switch-off pressure:	2.0 bars

Water pressure reducer

Connection:	1/2"
Set to:	2.0 bar

Solenoid valve, water

Connection:	1/2"
Voltage:	24 V

Flow meter

Range:	160 –1600 l/h
--------	---------------

Water connection GEKA-coupling

Water pump

Voltage:	400 V
Frequency:	50 Hz
Power:	0.6 kW
Quantity:	Q = 50 l/min.

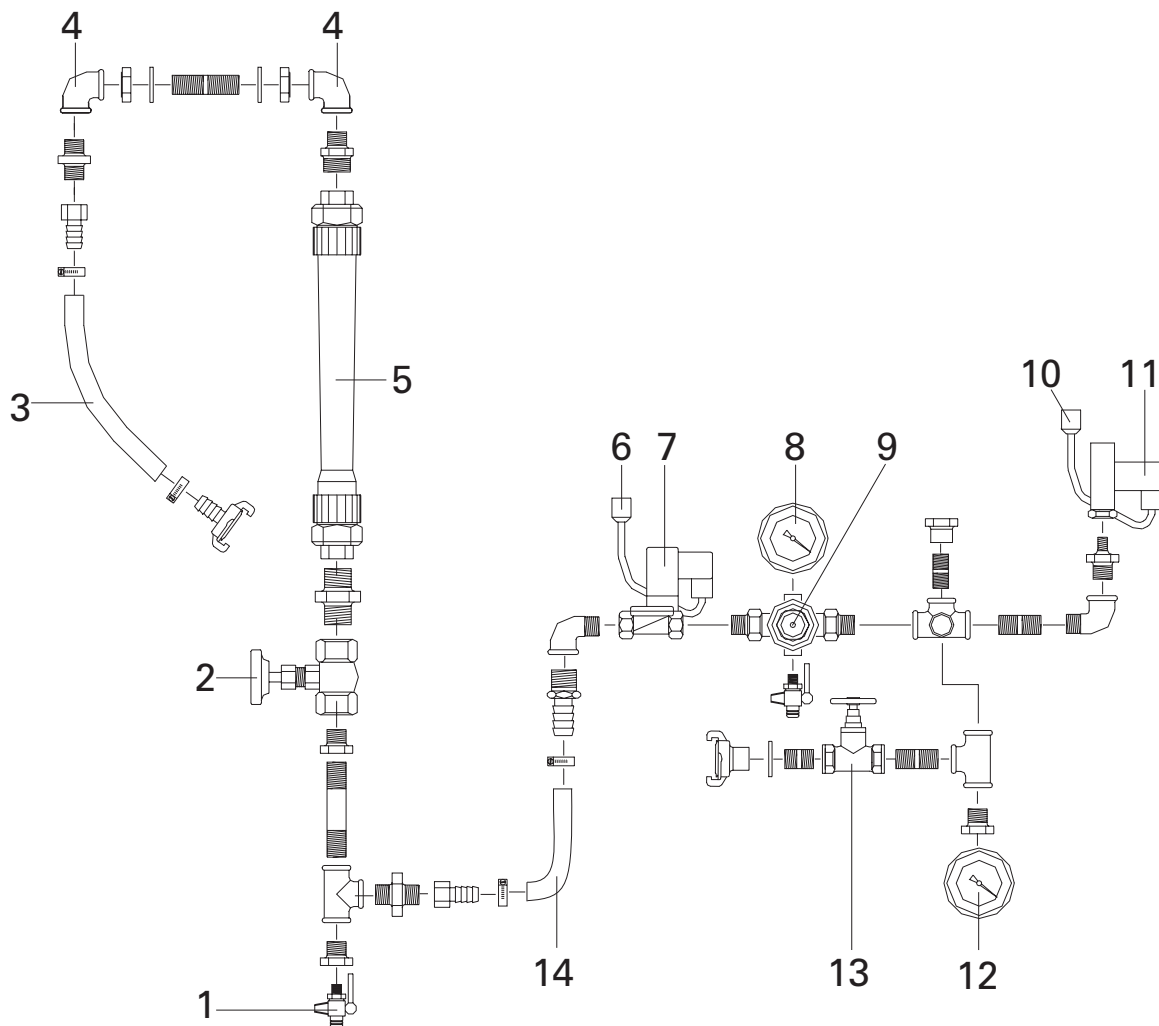


Fig. 12: Water fittings

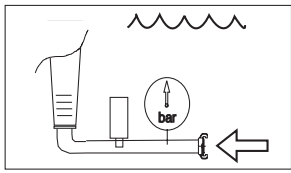
- | | | | |
|---|--|----|---|
| 1 | Release valve 1/4" | 9 | Water pressure reducer |
| 2 | Fine control valve 3/4" | 10 | Connection cable for water pressure monitor |
| 3 | Water hose with nozzle 1/2"; 1.1 m; complete | 11 | Water pressure monitor 0.5–8 bar |
| 4 | Angle 1/2" internal thread | 12 | Pressure gauge 0–16 bar |
| 5 | Flow meter 160–1,600 l/h | 13 | Two-way valve 1/2" |
| 6 | Connection cable for solenoid valve | 14 | Water hose 1/2"; 0.25 m; complete |
| 7 | Solenoid valve 1/2"; 24 V | | |
| 8 | Pressure gauge 0–4 bar | | |

2.6 Components supplied

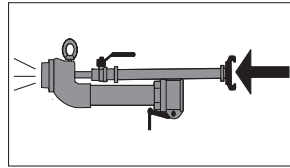
The machine is supplied with the following accessories:

- 1 stator type Ü45/7 incl. rotor to fit
- pump end piece V50
- mortar hose $\varnothing=40$, length 13,3 m with coupling V40/M40
- mortar hose $\varnothing=50$, length 13,3 m with coupling V50/M50
- Adapter M50/V40
- Cleaning set V50
- 1 water hose 1/2", 2 m complete
- 1 spray gun
- 1 hole brush, $\varnothing=25$ mm
- 1 spanner 19/24 mm
- 1 spanner 24/30 mm
- 2 spanners 10/13 mm
- 2 rubber sponge balls $\varnothing=45$ mm
- 2 rubber sponge balls $\varnothing=60$ mm
- GEKA coupling for 3/4" water hose
- 1 shaft cleaner
- 1 sieve-cup spanner
- 1 turning tool
- 1 screwdriver, size 7
- 1 hose pressure gauge 0 – 100 bars
V50/M50
- 2 solid-rubber wheels D = 260 x 85 without brake
- 2 solid-rubber wheels D = 260 x 85 with brake

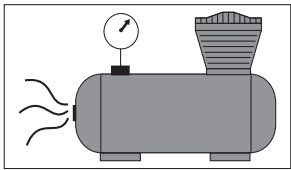
2.7 Symbols on the machine



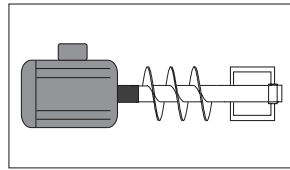
Water inlet



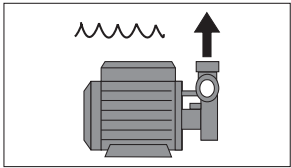
Air supply



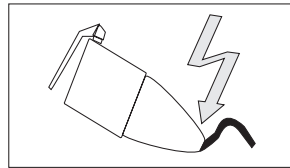
Connection for compressor



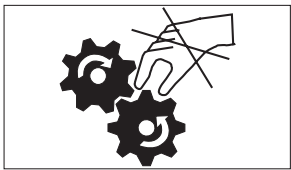
Connection for mixer motor



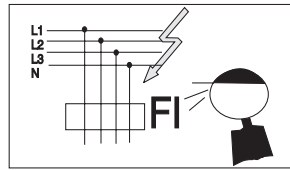
Connection for water pump



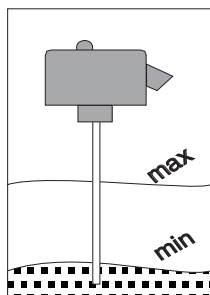
Power socket



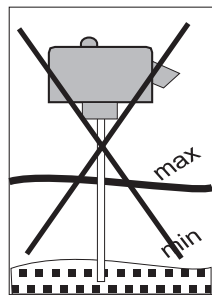
Warning moving / rotating parts!



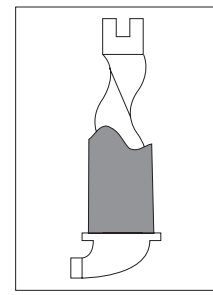
Operation only with earth leakage circuit breaker (RCD)!



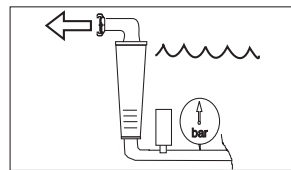
Dry-material probe "On"



Dry-material probe "Off"



Connection for pump motor



Water outlet

3 Transport and set-up

When transporting, setting up or dismantling the machine, always observe national and international safety regulations and legislation, even if these are not explicitly mentioned in these instructions.



3.1 Transporting the machine

- Before transporting the machine, empty the material trough.
- When moving the machine with a fork-lift truck, the forks must be positioned between the wheels on the frame of the machine.
- When moving the machine by hand, the mixing tube, compressor, spiral pump and accessories can be removed and transported individually. The frame itself is fitted with handles at various heights at both ends. (fig. 13)

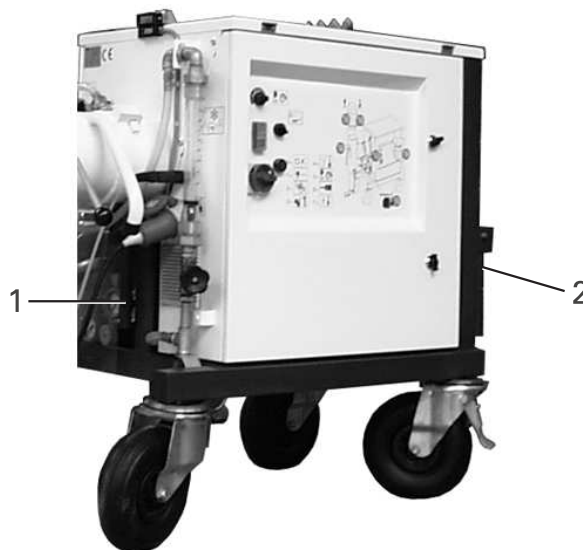


Fig. 13: Hand grips

3.2 Setting the machine up

When setting the machine up at the building site, always observe the following rules:



The machine must be positioned firmly on a level surface. It must be secured to prevent it from tilting or moving.

The machine must be positioned in an area where no objects can fall onto it from above. If this is not possible, it must be protected by a safety guard.

The machine must be positioned in such a way that all the operating elements are easily accessible at all times.

4 Standard start-up

When transporting, setting up or dismantling the machine, always observe national and international safety regulations and legislation, even if these are not explicitly mentioned in these instructions.



4.1 Installing the spiral pump

- When working with flowing screed, use the rotor/stator D8-2 or Ü45/7(supplied) for the spiral pump
- Observe the installation instructions on the stator (fig. 14, 3), and insert rotor accordingly
- Hook the connecting rod (fig. 14, 2) onto one side of the pump mixing tube (fig. 14, 6)
- Place the stator with rotor (spiral pump) on the pump end piece (fig. 14, 1) without canting the rotor and stator
- Hook the second connecting rod onto the pump mixing tube
- Using the wedges (fig. 14, 5) tighten the spiral pump and the end piece; if the pump is not positioned firmly enough, loosen the counter nuts on the connection rods, tighten the tensioning nuts and re-secure with the counter nuts.

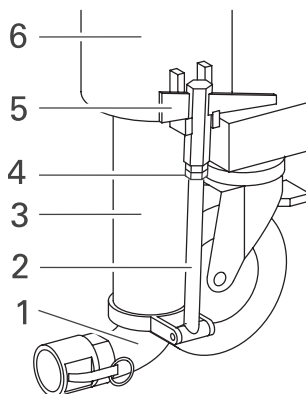


Fig. 14: Installing spiral pump

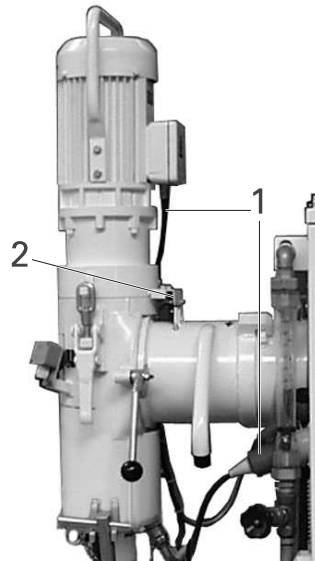
- | | |
|---|------------------|
| 1 | Pump end piece |
| 2 | Connecting rod |
| 3 | Stator |
| 4 | Counter nuts |
| 5 | Wedge |
| 6 | Pump mixing tube |

4.2 Connecting the pump motor

- Connect pump motor using cable with plug (16 A 5pole 6h) (Fig. 15, 1)
- Ensure that the pump motor is correctly locked in position. Magnetic safety switches are parallel (no error signal code 3 given in the display)

Fig. 15: Connecting the pump motor

- 1 Pump-motor cable with plug
- 2 Magnetic safety-switch "Pump mixing pipe"



4.3 Water connection

- Using a hose with a 3/4" GEKA coupling, connect the machine to the water supply (fig. 16, 1)
- Connect the internal water hose to the mixing tube (fig. 16, 2)

Fig. 16: Water connection

- 1 Water inlet
- 2 Connection of internal water hose



4.4 Connecting the mortar hoses

Use only mortar hoses with a permitted operating overpressure of 40 bars and a bursting pressure of at least 120 bars.

We recommend installing a hose-pressure gauge. This allows the pressure in the mortar hoses to be monitored at all times.

Always depressurise mortar hoses before uncoupling them!

- If necessary, connect the hose pressure gauge to the pump end piece
- Couple the mortar hose after the hose pressure gauge or the pump end piece (figs. 17, **1**, **2**, p. 36). To couple mortar hoses $\varnothing=40$ or $\varnothing=50$

Keep the mortar hoses as short as possible. Hoses which are too long cause an unnecessary load on the spiral pump, leading to excessive wear. Ensure that air and mortar hoses are laid in as straight a line as possible from the machine to the work area.



ATTENTION!

4.5 Connecting remote control



If the machine is switched off remotely, it remains on standby and can be switched on again remotely at any time. This is indicated by "5" in the display.

- Roll out remote-control cable drum to working position
- Connect control cable of cable drum to flange socket (fig. 17, ③)
- Set the remote-control switch on the cable drum to "1"

If an additional 12 m extension is being used:

- Connect extension to 4-pole socket of cable drum

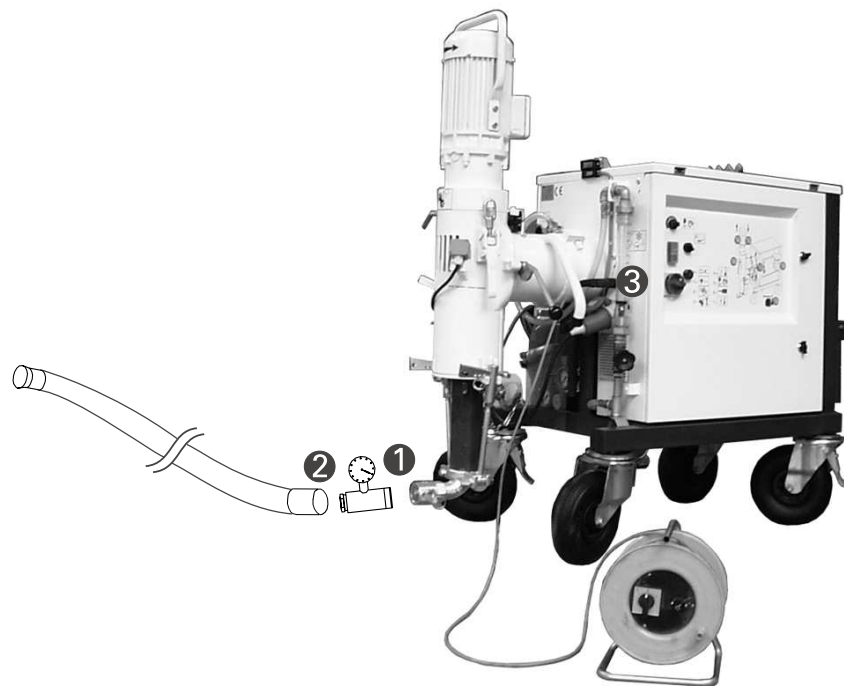


Fig. 17: Connections when using remote-control cable drum

4.6 Power supply

The machine must be connected to a regulation site distributor box with FI automatic circuit breaker and fuse protection of at least 25 A. The connection cable must have a cross section of at least 5 x 4 mm² and a connection coupling of 32A 5 pole 6h.



- Set the main switch of the machine on the control panel to "0"
- Connect the power cable.

4.7 Motor-rotation direction

The correct direction of rotation for the water pump, mixer motor and pump motor is controlled automatically by the control system. The direction of rotation can be checked by the fan wheel of the pump motor and at the mixer itself.

4.8 Connecting the wet-mortar probe

When working with gypsum plasters, insert the wet-mortar probe into the left-hand probe holder (fig. 18, 1). When processing other types of plaster and adhesives, insert it into the right-hand holder (fig. 18, 2).

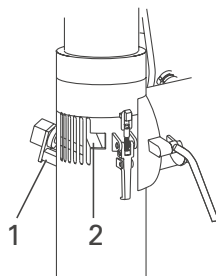


Fig. 18: Probe holder

4.9 Flushing the hoses



To avoid blockages, the mortar hoses must be lubricated with slurry before use.

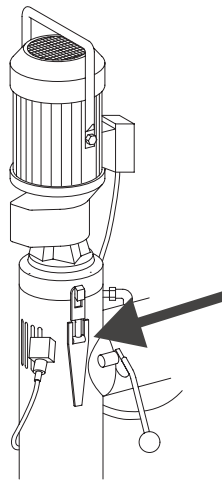
Ensure that the main switch is at "0"!

- Release the lock of the pump motor (fig. 19)
- Fold the pump motor away from the pump mixing tube
- Fill the pump mixing tube with approx. 10 litres of slurry

ATTENTION!

Do not put slurry in the material trough!

*Fig. 19:
Lock on pump motor*



- Fold the pump motor onto the pump mixing tube and lock it into position
- Set the main switch to "1" and the push button "On/Off" to "On"
- Press push button "Pump motor forward" and allow the pump to run until the slurry is completely pumped out
- Press push button "Pump motor forward"; the pump motor is switched off

4.10 Filling with bagged material

- When using material in bags, fill the material trough through the safety grid

Do not remove the safety grid when filling the machine with bagged material. Do not put your hands into the material trough. Do not place any objects in the material trough!



4.11 Setting material consistency

Special care must be taken during the following operations!

Never put your hands into the machine when it is in operation!

- Ensure that the main switch is set to "1" and the machine is switched off at the double push button "On/Off".
- Release the lock on the pump mixing pipe and pivot the complete pump assembly (fig. 20, 1) away from the mixing pipe
- Mount the safety outlet (fig. 20, 2).
In place of the magnetic safety switch "Pump mixing pipe" (fig. 20, 3) the magnetic safety switch "Safety outlet" is engaged.
- Place a bucket under the outlet

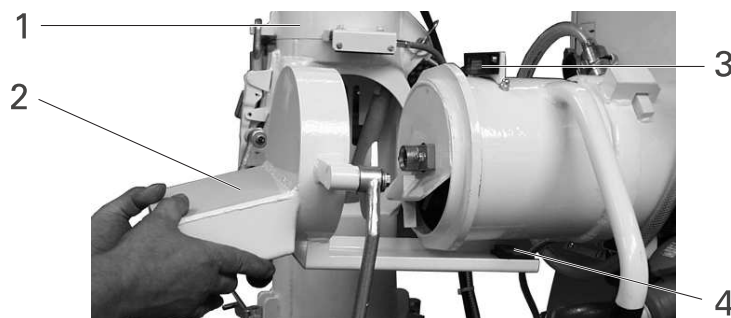


Fig. 20: Safety outlet

- 1 Pump section
- 2 Safety outlet
- 3 Magnetic safety switch "Pump mixing pipe"
- 4 Magnetic safety switch "Safety outlet"

- Press the button “Water infeed”, check the reading on the flow meter and set it to approx. 800 l/h with the fine control valve
- Press the button “Mixer motor”
- Check the material consistency and alter it with the fine control valve if necessary
- Switch the machine off at the double push button “On/Off”. Set the main switch to “0”.
- Remove safety outlet
- Tilt the pump mixing pipe back to the mixing pipe and lock it into position



Dispose of the mortar in the bucket in the proper way (i.e. as building waste).

5 Special types

5.1 Filling with bulk material from silo

The duo-mix 2000-si / FE 50 can be filled with bulk material from a silo

- via a filter hood (optional) in combination with a conveyor system
- or via a feeding hood (optional)

The dry-material probe monitors the amount of material in the trough and switches the machine off if it drops below a certain level. The machine goes on again automatically when more material has been added.

Switch the main switch to "0" and pull out the power plug!

- Remove the safety grid

Filter hood (optional)

See operating instructions for the conveyor system!

- Mount the filter hood on the duo-mix 2000-si / FE 50
- Couple the mortar hoses to the filter hood and the conveyor unit



Fig. 21: duo-mix 2000-si / FE 50 with filter hood



Feeding hood (optional)

Observe the operating instructions for the feeding hood!

- Mount the feeding hood on the duo-mix 2000-si / FE 50
- Mount the flange and bellow on the silo flange
- Open the revolving flap on the silo and fill the material trough



Fig. 22: duo-mix 2000-si / FE 50 with feeding hood under a small silo

5.2 Using the machine as continuous mixer

Without the pump unit and with the long mixing tube (supplied) added, the machine can also be used as a continuous mixer.

Set the main switch to "0" and pull out the power plug and the pump-motor plug!



- Remove wet-mortar probe from pump section and push it into the holder provided for that purpose on the machine. However, leave the plug inserted in the switch cabinet, otherwise the machine cannot be operated as a continuous-flow mixer.
- Remove the lock on the pump mixing pipe and pivot the entire pump assembly (fig. 23,1) away from the machine.
- Mount the safety outlet (fig. 23, 2).

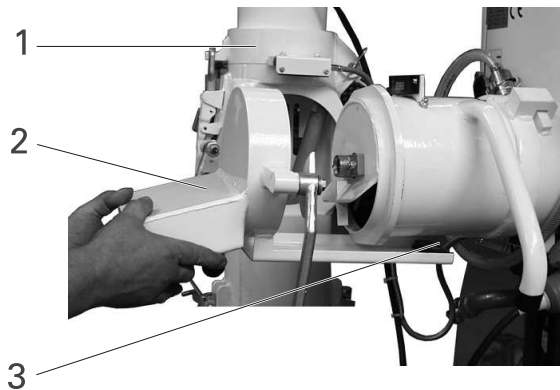


Fig. 23: Assembly continuous-flow mixer

- 1 Pump section
- 2 Safety outlet
- 3 Magnetic safety switch "Safety outlet"

ATTENTION!

The conical end on the mixing shaft and the sleeve on the feeder screw must be absolutely clean and dry before they are assembled. Never grease these two parts, as this makes it impossible to release the mixing shaft from the transport shaft.

The machine is connected to the power and water supply and filled with bagged material as described in the section "Standard start-up".

Check the material consistency at the mixer:

- Place the container under the material outlet
- Re-connect the power plug
- Set the main switch to "1" and the "On/Off" switch to "On"
- Press push button "Set water", check the flow on the flow meter and set to approx. 800 l/h.
- Check the material consistency and adjust it if required with the fine control valve
- Switch the machine off with the "Off" button; set main switch to "0".

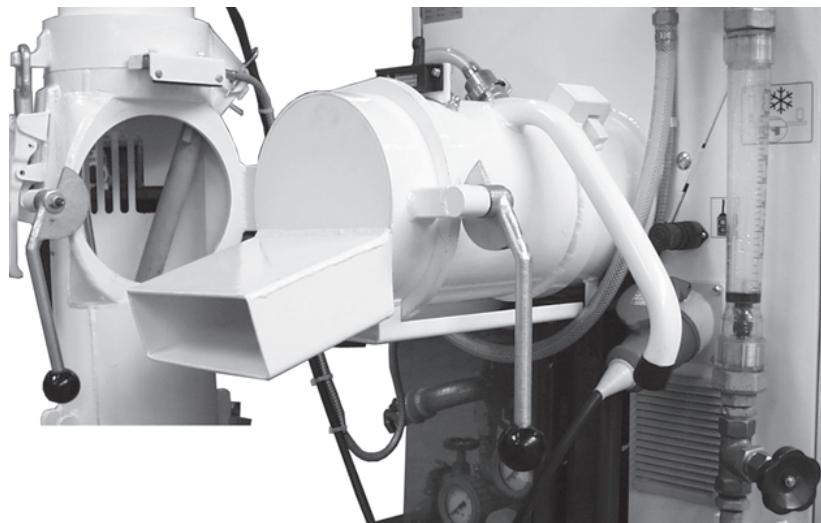


Fig. 24: duo-mix 2000-si / FE 50 as continuous mixer

6 Operation

Always observe the applicable national and international safety regulations and legislation during work, even if such regulations and legislation are not explicitly mentioned in these instructions.



Before every shift, check the machine carefully for obvious signs of damage, in particular to electric cables, plugs, feed and air hoses. Any damage must be repaired before beginning work.

If the machine is switched off remotely, it remains on standby and can be switched on again remotely at any time. This is indicated by "5" in the display.

The machine is fitted with a frequency inverter. After switching the machine off at the main switch, it must remain off for at least 30 seconds (e.g. after work or malfunction). If the machine is switched on again after less than 30 seconds, the frequency inverter may fail to function properly.

ATTENTION!

Material adhering to the wet-mortar probe must be removed every two or three hours. When removing the probe, take care not to damage the insulation on the contact rod.

6.1 Mixing and pumping

- Set the main switch to "1" and the "On/Off" switch to "On"; the display now shows "0"
- Set rotary-type switch "Operation / Cleaning" to "Operation"
- Press push button "Pump motor forward" once, it lights up and the pump motor starts
- Press push button "Mixer motor" once; the mixer motor and the water pump are switched on; the green push buttons "Set water", "Water pump" and "Mixer motor" light up

The machine is now running in automatic mode. It mixes and transports material and is controlled by the dry-material probe (option) in the material trough and the wet-mortar probe in the pump mixing pipe. As soon as the machine is switched on from "Standby", the pump motor starts up, followed by the mixer motor after a delay of approx. 1 sec.

6.2 Break times

During breaks in work, remember the setting time of the material being used. The material sets more rapidly at high temperatures!

ATTENTION!

Short intervals

- Switch off remote control on cable drum

The water pump, mixer and pump motor are switched off automatically. The machine is still on standby (display shows "5") and can re-start at any time.

Intervals longer than 10 minutes

- Switch the machine "Off" at the "On/Off" switch

At high outside temperatures or during breaks in work of more than 30 minutes

- Empty the pump mortar hoses; then turn main switch to "0"

Dispose of mortar residues in accordance with regulations!



6.3 Removing blockages



When a blockage occurs

Switch the machine off at once, i.e. press the button for pump and mixer motor.

- Press the button “Pump motor reverse” until the mortar hoses are fully depressurised.



Always depressurise mortar hoses before uncoupling them. Before opening, cover the coupling with a tarpaulin. Wear regulation goggles and do not face the coupling directly, as material may spray out.

- Switch machine off at button “Off” and set main switch to “0”
- Uncouple the mortar hoses from the machine and the spraying unit or adhesive gun
- Clean the mortar hoses (see p. 50)

6.4 Winter operation

ATTENTION!

Under sub-zero conditions, water fittings may be damaged if allowed to freeze. For this reason, all parts of the machine containing water must be completely emptied before longer interruptions in work.

- Stop the flow of water
- Empty the hoses supplying the machine and those on the machine itself
- Open the draining valve on the water pump
- Blow out the water fitting with air from the compressor.

ATTENTION!

Close all the draining valves before starting the machine again.

6.5 Finishing work

When only 1–2 m² of surface remain to be plastered:

- Switch the mixer motor off with the “Mixer motor” push button .
- Increase the water flow at the fine control valve by 300–500 litres per hour and continue spraying until the material becomes thinner

Do not use the thin material, but allow it to run into a bucket.

ATTENTION!

- Allow the machine to run until the pump unit is empty (visual check through the slots in the pump mixing tube)
- Switch off the pump motor with the “Pump motor” button
- Remove any material adhering to the wet-material probe

7 Cleaning



The cleaning operations must be carried out in the sequence described!



Dispose of mortar residues in accordance with regulations!

- Allow machine to run until empty as described in section entitled "Finishing work" (page 49).

7.1 Uncoupling mortar hoses



The mixer and pump motor must be switched off.

- Keep the button "Pump motor reverse" pressed until the mortar hoses are completely depressurised



Ensure that the mortar hoses are completely depressurised! The actual pressure in the mortar hoses can be read off the hose pressure gauge. Switch the machine off at the "Off" switch and set the main switch to "0".

Before opening, cover the coupling with a tarpaulin. Wear regulation goggles and do not face the coupling directly, as material may spray out.

- Uncouple the mortar hoses from the machine
- Remove the pump end piece and clean it with water; remove any encrusted material with a spatula
- Replace pump end piece

7.2 Cleaning the pump unit

- Connect the water hose to the cleaning valve (fig. 25)

Remove the pump-motor plug from the control panel!



- Set rotary-type switch "Operation /cleaning" to "Cleaning"
- Set the main switch to "1" and the "On/Off" switch to "On"
- Switch the water pump on with the push button "Water pump"
- Open the cleaning valve and spray water into the slots of the pump mixing tube
- Release the lock on the pump motor and fold the motor down
- Spray the pump unit out with the spray gun
- Switch the water pump off at the switch "Water pump"
- Fold the pump motor back and lock it into position
- Set rotary switch "Operation / Cleaning" to "Operation"
- Replace the plug of the pump motor
- Switch the pump motor on at the switch "Pump motor forward"
- Allow the pump to run until all the water is pumped out of the pump unit
- Switch the pump unit off with the switch "Pump motor forward"

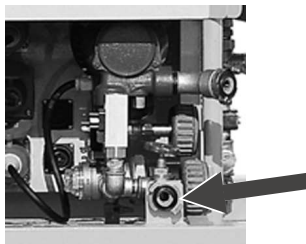


Fig. 25: Cleaning valve

7.3 Cleaning the mortar hoses

- Push the correct sponge-rubber ball into the mortar hose (uncoupled at both ends)
- Couple one end of the mortar hose to the reduction adapter (M35/GEKA) on the cleaning valve of the water fitting (see fig. 25, page 51)
- Open the cleaning valve
- Set rotary switch "Operation / Cleaning" to "Cleaning"
- Set the main switch to "1" and the "On/Off" switch to "On"
- Switch the water pump on with the button "Water pump" and allow it to run until the sponge-rubber ball emerges from the other end of the hose
- Repeat the procedure until clear water emerges from the mortar hose
- Switch the water pump off at the switch "Water pump"

7.4 Cleaning the mixing tube

Set the "On/Off" switch to "Off" and the main switch to "0". Then pull out the power plug.



- Release the lock on the pump unit and fold the pump unit away from the mixing tube
- Place a container under the mixing tube
- Release the lock of the mixing tube and uncouple the mixing tube from the machine

Close the feed unit of the machine with the plug supplied (fig. 26) to prevent water from entering it!

ATTENTION!

- Pull out the mixer shaft
- Clean the mixer shaft and tube with a spatula to remove most of the material and then spray with water and brush
- Clean the water inlet of the mixing tube especially carefully
- Remove plug from feeding unit



Fig. 26: Close feed unit with plug

7.5 Cleaning the feed unit



The feed unit should be cleaned absolutely dry. The conical end on the mixing shaft and the sleeve on the mixer screw must be absolutely clean and dry before they are assembled. Never grease them, as this makes it impossible to release the mixing shaft from the dosing shaft.

- Clean the feed unit of the machine with a dry spatula
- Insert the end of the mixing shaft into the sleeve of the transport screw
- Re-couple the mixing tube securely

8 Troubleshooting

The table “Troubleshooting” is not intended to replace the detailed instructions in the individual sections of the Operating Instructions. Always observe the safety notes in,1 the sections concerned.



Fig. 27, left:

Operating and display elements 1

- 1 Main switch
- 2 Display
- 3 Double push button “On/Off”
- 4 Rotating switch “Operation/Cleaning”
- 5 Speed controller pump motor

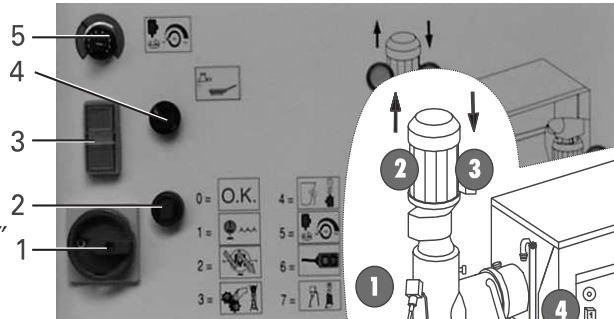
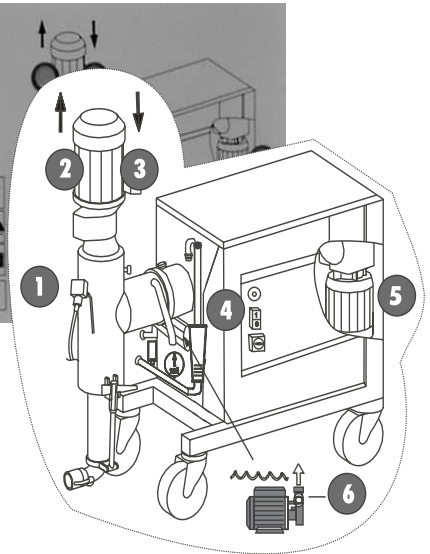


Fig. 27, right: Operating and display elements 2

- ① Signal lamp Wet-mortar probe, red
- ② Push button without self-hold “Pump motor reverse”, green
- ③ Push button with self-hold “Pump motor forward”, green
- ④ Push button without self-hold “Set water”, green
- ⑤ Push button with self-hold “Mixer motor”, green
- ⑥ Push button with self-hold “Water pump”, green



The information shown in the display is intended to assist in locating faults.

Display Meaning of display

- 0 “o.k.” – ready for operation / no faults existing
- 1 The water pressure monitor has detected that too little water or no water is being supplied. The machine does not start.
- 2 A motor-protection switch has triggered (Q1-Q5).
- 3 Magnetic safety switch “Safety grid” signals that the grid is not closed, or the magnetic safety switch “Pump mixer pipe” signals that the lock is not closed, or the magnetic safety switch on the safety outlet signals that the lock is not closed.
- 4 The dry-material probe signals no dry material available. The machine cannot start.
- 5 Fault in the frequency inverter
- 6 Fault: use of a cable drum to extend the remote-control cable – the “On/Off” switch on the cable drum is at “Off”.
- 7 Dry-running protection for stator/rotor. If the wet-mortar probe signals “full” for more than 30 secs although the pump motor is running, the machine switches the “On/Off” switch to “Off”.

Each of the above-mentioned defects has the effect of switching the “On/Off” switch to “Off”. After correcting the fault, the “On/Off” switch should be switched back to “On”.

8.1 Trouble during start-up

Display	Fault	Cause	Remedy
no display	Machine cannot be switched on with main switch and On/Off-switch	no power	Check fuses, cables, plugs of connection line
1	The machine cannot be switched on with switches ②-⑥	no water pressure or water pressure too low Plug for water pump is not plugged into control panel Water pump defective	Check water infeed pipe and sieve Insert water-pump plug Replace water pump
1	Correct water quantity cannot be set	Sieve from pressure reducer clogged Pressure reducer set too low Water inlet in feed pipe closed	Remove sieve and clean Set pressure reducer to 2.0 bar operating pressure Clean water inlet
2	Machine cannot be switched on with switches ②-⑥	Motor-protection switch (Q1-Q5) triggered during transport	Press in motor protection switch in control panel
2	Pump motor cannot be set with button no. ③	Pump mixing tube has not been properly cleaned and rotor is stuck Rotor/Stator worn/damaged	Press buttons ② and ③ alternately to free rotor Check condition of rotor/stator and replace if necessary
2	Motor-protection switch Q1 triggers	Pump end piece clogged	Clean pump end piece
3	The machine cannot be switched on with buttons ②-⑥	Magnets of magnetic safety-switches on pump mixing pipe or safety grid are not set parallel	Check lock on pump mixer pipe Close safety grid. Set magnets parallel at a distance of 0.5 to 1.5 mm
4	Mixer motor runs for only approx. 4 secs. and then switches off	Dry-material probe wet No dry material	Dry probe Fill with dry material
5	Machine does not start	Fault in frequency inverter	1. Switch the machine off at the main switch, and switch it on again after 30 secs; if this does not work 2. switch off protection switch Q1; the pump motor now operates without frequency inverter at mains frequency
7	Machine cannot be switched on with main switch and On/Off switch	Wet-mortar probe plug not inserted	Plug in probe plug

8.2 Trouble during operation as mixing pump

Display	Fault	Cause	Remedy
0	Material from mixer fluctuates in consistency	Feed screw clogged	Remove feed screw and dry clean
0	Water running from mixing part into pump part	Solenoid valve clogged	Remove and clean membrane; check that the balance hole in the membrane is open
1	Mixer and pump motor always switch off	water-inlet sieve clogged water infeed leaking or kinked or water tap not fully opened	remove sieve and clean it check water-feed pipe
2	Motor protection switch of pump triggers	material consistency too thick pump (stator and rotor) too tight pump end piece clogged	set consistency loosen pump slightly clean pump end piece
3	The machine cannot be switched on with buttons 2-6	Magnets of magnetic safety-switches on pump mixing pipe or safety grid are not set parallel	Check lock on pump mixer pipe Close safety grid. Set magnets parallel at a distance of 0.5 to 1.5 mm
5	Machine does not start	Fault in frequency inverter	1. Switch the machine off at the main switch, and switch it on again after 30 secs; if this does not work 2. switch off protection switch Q1; the pump motor now operates without frequency inverter at mains frequency
6	Pump motor does not start during spraying	air hose jammed air valve clogged air-pressure monitor set too low air hose too thin	check air pipe clean nozzle set air-pressure monitor to 1.8 bars switch-off pressure use 1/2" air hose
0...5...0	Pump motor cannot be switched on via spraying unit or fine-plaster spraxing unit	Safety valve on compressor does not close Safety valve set too low Air monitor set too high Compressor produces too little air	Switch machine off at "On/Off" switch, then Release safety valve Set valve to 3.2–3.5 bars Set pressure monitor to 1.8 bars switch-off pressure Check membrane and valve plate and replace if necessary
7	Pump motor switches off 30 secs. after remote control is switched on	Dry-run protection for rotor/stator. If the wet-mortar probe still indicates "full" probe 30 secs after material has been pumped out the machine probably switches off because the wet-mortar probe is clogged or defective	Check, clean or replace wet-mortar
7	Wet-mortar probe no longer free	Wet mortar probe defective Plug of wet-mortar probe not inserted	Renew wet mortar probe Insert plug in control panel

8.3 Trouble during operation as continuous mixer

Display	Fault	Cause	Remedy
3	Mixer does not start	Magnets on magnetic safety switch "Safety outlet" are not set parallel	Check contact on mixing pipe. If necessary set magnets to a distance of 0.5 to 1.5 mm or replace them
5	Machine does not start	Fault in frequency inverter	1. Switch the machine off at the main switch, and switch it on again after 30 secs; if this does not work 2. switch off protection switch Q1; the pump motor now operates without frequency inverter at mains frequency
7	Mixer does not start	Wet-mortar probe contacts metal Plug of wet-mortar probe not inserted	Probe must not touch metal; place probe in special holder provided Insert probe plug in control panel

For other problems, see "Trouble during operation as mixing pump".

9 Maintenance and servicing

Before working on the machine, always pull out the power plug, as certain components remain live even when the machine is switched off.

The machine must be inspected by a specialist engineer in accordance with applicable safety legislation. It should be inspected at least once per year.



9.1 Periodic maintenance

- Remove mortar residue from the mixing tube, dry material pipe and feeder screw regularly, and dispose it of in accordance with regulations
- Fill the rubber collar on the mixer motor regularly using a grease gun
- Lubricate hinges and socket pins regularly with a grease gun
- Clean the compressor air filter regularly
- Clean the sieve on the pressure reducer regularly
- Clean the water-inlet sieve regularly
- Check hose and cable connections regularly (especially to consumers) to ensure that they are in good condition
- The filters in the control panel of the frequency inverter must be cleaned with compressed air every 4 weeks at least and replaced every six months. These periods should be shortened if the dust content in the surrounding air is high.

9.2 Oil change

The gear motors are supplied ready for use and are maintenance-free up to 8000 hours of operation. After this period, the gears must be cleaned thoroughly with suitable flushing oil and then inspected.

ATTENTION!

Do not overfill transmissions and motors with lubricant, as this may cause overheating. Do not mix different types of oil or grease. Disregarding the lubrication instructions will invalidate the guarantee!



When removing oil, grease or cleaning agents, always observe the applicable environmental regulations.

For oil changes, we recommend the following lubricants:

for the pump motor Esso Fließfett (liquid grease) S420, quantity 1160 cc; **for the mixer motor** Shell Tivela Oil 82, quantity 800 cc.

The following lubricants can be used as substitutes:

Grease

Pump motor:

Aral FDP 00
BP Energrease HTO
Esso Fibrax EP-370
Mobil Mobilplex 44
Shell Special Gear Grease H

Oil

Mixer motor:

Aral Degol BG 220
BP Energol GR-xP 200
Esso Sparton EP-220
Houghton Molygear 115
Mobil Mobilgear 630
Shell Omala 220
Calypsol Bison Oel
MSR 114

10 Accessories

Modifications to the machine are prohibited. Use only spare parts and accessories supplied by m-tec mathis technik gmbh. If spare parts and accessories of non-approved types are used, m-tec mathis technik gmbh will assume no liability in case of accident or damage.



Orders for spare parts should be sent to the following address. Always remember to state the correct article number:

m-tec mathis technik gmbh, Sales Dept.

Tel.: +49 / 7631 709-112 or -216

Fax: +49 / 7631 709-166

Accessory	Art. no.
Long mixer tube for use as continuous mixer	605028
Long mixer shaft for use as continuous mixer	608545
Connection cable 5 x 4 mm ² 32A 5-pole 6h 50m	606155
Connection cable 5 x 4 mm ² 32A 5-pole 6h 25m	606165
Feeding hood/si-version	please enquire with m-tec

For other spare parts, refer to spare-part catalogue.

11 Circuit diagram

Key for figs. 28–33 page 63–67 :

B1	Bridge rectifier	S4	Button "Pump motor forward"
B2	Bridge rectifier	S5	Button "Pump motor reverse"
F1	Automatic circuit breaker 16A (safety contact)	S6	Button "Mixer motor ON"
F2	Automatic circuit breaker 2-pole 0.5A prim. transformer	S7	Button "Water pump ON"
F3	Automatic circuit breaker 2A sec. transformer	S8	Button "Set water" (solenoid valve)
FU	Frequency inverter	S9	Rotating switch "Dry-material probe On/Off"
H1	Signal lamp "In operation"	S10	Selector switch for SPC control system
H1.2	Signal lamp "Mixer motor ON"	S11	Rotary switch "Operation / Cleaning"
H1.7	Signal lamp "Pump motor reverse"	T1	Transformer 400 V/24 V
H1.8	Signal lamp "Wet-mortar probe fault"	U1	Phase sequence relay
H1.9	Signal lamp "Pump motor forward"	U2	Electronic unit, probe
H1.11	Signal lamp "Set water" (Solenoid valve)	U3	Programmable control (SPC)
H1.13	Signal lamp "Water pump ON"	U4	7-Segment display
K1	Contacteur	U5	Monitoring center
K2	Contacteur frequency inverter	X13	Magnetic safety switch
K3	Contacteur pump motor, operation with frequency inverter	X14	Magnetic safety switch
K4	Contacteur pump motor	X15	Magnetic safety switch
K5	Contacteur mixer motor	Y1	Solenoid valve, water
K6	Contacteur water pump	MM	Mixer motor
K7	Contacteur compressor	MV	Mixer valve
K8	Auxiliary contacteur rotation direction, frequency inverter	NMS	Wet mortar probe
K10	Auxiliary relay, self hold	TMS	Dry material probe
P1	Potentiometer rotation speed, frequency inverter		
PL1	Pressure monitor, air 1		
PL2	Pressure monitor air 2 – compressor switch off		
PW	Pressure monitor water		
Q1	Motor-protection switch, frequency inverter		
Q2	Motor-protection switch, pump motor		
Q3	Motor-protection switch, mixer motor		
Q4	Motor-protection switch, water pump		
Q5	Motor-protection switch, compressor		
S1	Main switch		
S2	Button "Off"		
S3	Button "On"		

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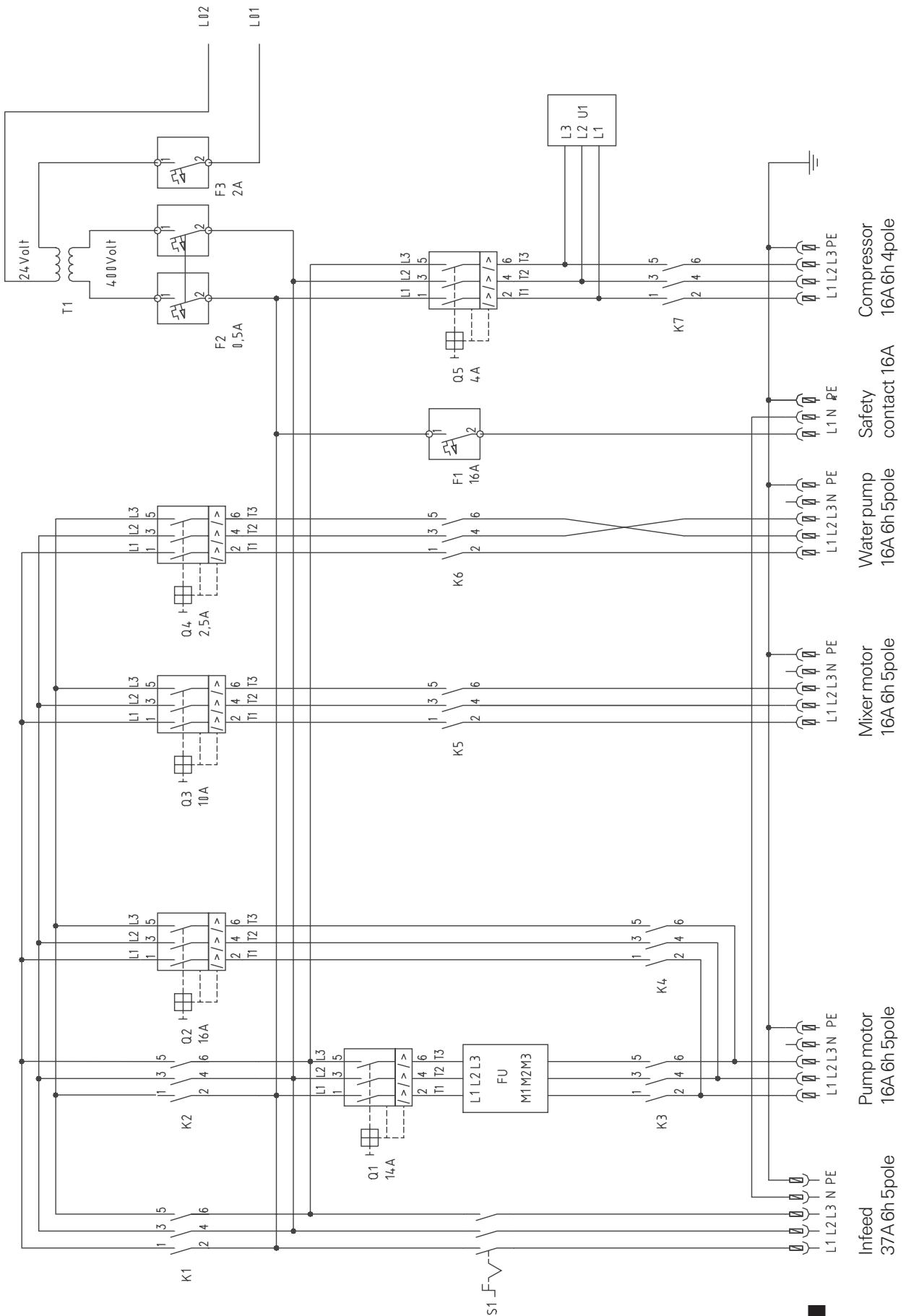


Fig. 28: Circuit diagram power unit 1 (key see p. 62)



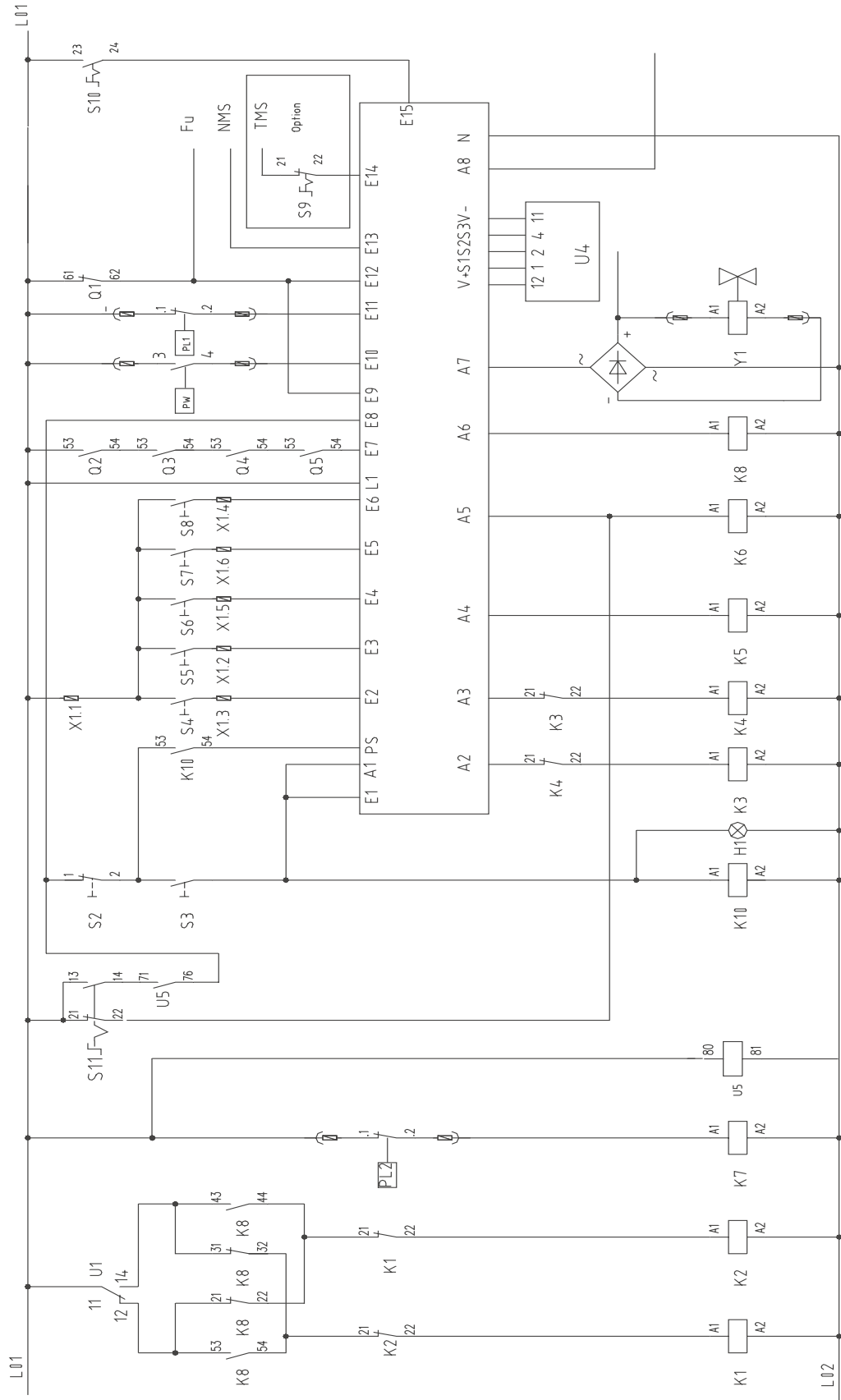


Fig. 29: Circuit diagram control unit 1 (key see p. 62)

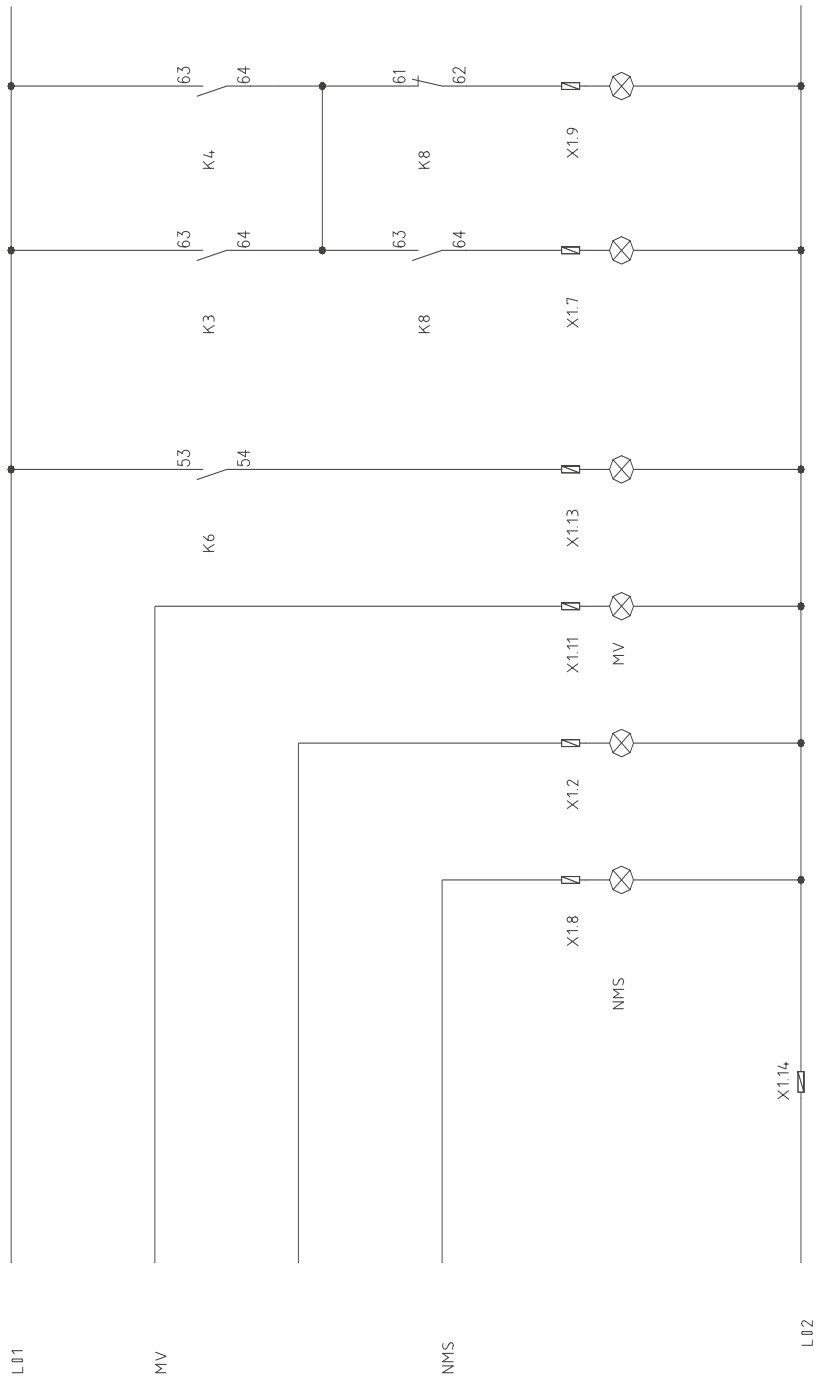


Fig. 30: Circuit diagram control unit 2 (key see p. 62)

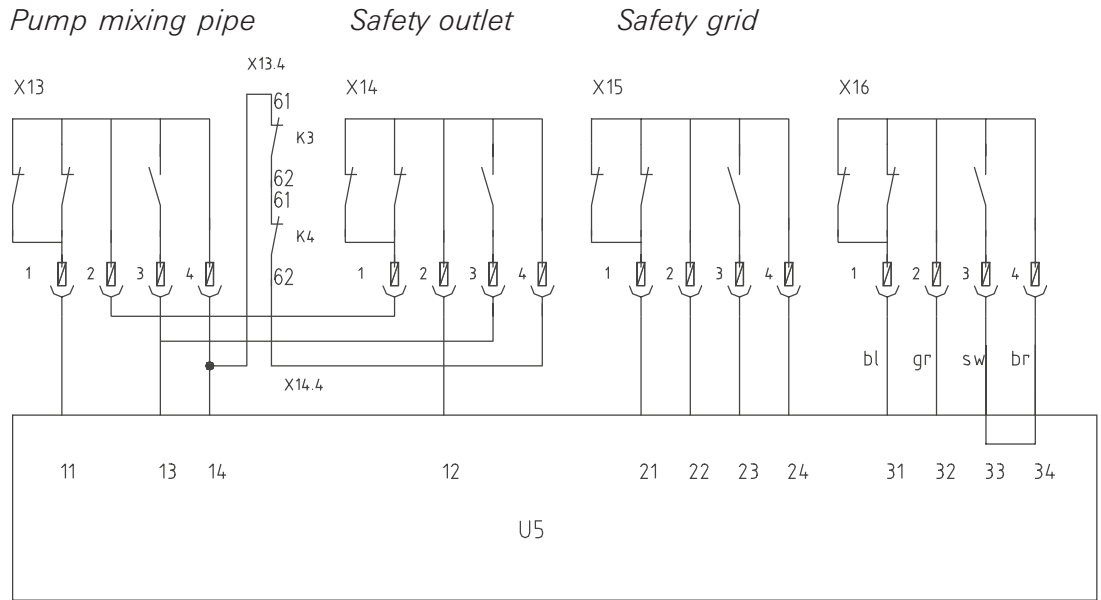


Fig. 32: Circuit diagram control unit 4 (key see p. 62)

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