

Operating Instructions

Pump speedy MP



© 2002 m-tec mathis technik gmbh

Copyright in these operating instructions remains with m-tec mathis technik gmbh. These operating instructions are intended for use by installation, operating and maintenance personnel. They contain technical regulations and drawings which may not be copied, distributed or used for advertising purposes either in whole or in part without authorisation.

Technical development:

The manufacturer reserves the right to adapt technical data without notification to reflect the current state of technical development. For information regarding the current status, alterations or additions to these operating instructions, please contact m-tec.

Dear Customer,

this machine represents the current technical state of the art and complies fully with generally applicable standards and EC directives. This is indicated by the CE mark and the enclosed declaration of conformity, which can be found in the pocket on the machine.

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



Before starting the machine for the first time, fill in the information required on this page. This is the easiest way to familiarise yourself with the characteristics of the machine, and the important data can be consulted at any time without having to read them off the machine plate. Please have this information at hand if you wish to consult us about this machine. 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 _____

1	Safety	6
1.1	Danger symbols.....	7
1.2	Safety at work.....	8
1.3	Personal safety equipment.....	12
2	Description of the machine	13
2.1	Intended use.....	13
2.2	Machine versions.....	13
2.3	Functioning	13
2.4	Machine diagram	14
2.5	Switch cabinet	15
2.6	Operating and indicating elements	16
2.7	General data of the entire machine	17
2.8	Technical data of the pump unit.....	17
2.9	Air supply (optional).....	18
2.10	Components supplied	18
2.11	Markings on the machine.....	20
3	Setting up the machine	21
4	Start-up	22
4.1	Power connection.....	22
4.2	Checking direction of motor rotation	23
4.3	Assembling the screw pump	24
4.4	Connecting the mortar hoses.....	25
4.5	Connecting the spraying unit	25
4.6	Flushing the hoses	26
5	Operation	27
5.1	Filling with material from bucket	27
5.2	Filling from continuous-flow mixer	27
5.3	Pumping.....	27
5.4	Spraying with a spraying unit	28
5.5	Removing blockages	28
5.6	Intervals	29
5.8	Finishing work.....	29
6	Cleaning	31
6.1	Cleaning the material trough and screw pump.....	31
6.2	Cleaning mortar hoses.....	31
6.3	Cleaning the spraying unit.....	32
7	Troubleshooting	33
7.1	Problems during start-up	33
7.2	Problems during operation	33

8	Maintenance	34
8.1	General care and maintenance operations	34
8.2	Monitoring and testing	34
9	Spare parts/accessories	35
10	Circuit diagram	36

1 Safety



The pump has been designed and built using the latest technology and has left the manufacturer's plant in perfect condition. However, it may be dangerous to persons and property if used incorrectly, for the wrong purpose, or by untrained personnel.

For this reason, all persons involved in operating the machine must read the Operating Instructions, particularly the "Safety" section, and ensure that any difficulties are resolved before starting it up (see manufacturer's address on the back of the cover). They should also use the descriptions to familiarise themselves with the machine controls and operation. This will prevent damage and ensure correct and efficient working with the m-tec pump.

The Operating Instructions for the m-tec pump must always be kept at the machine so all users can consult them at any time.

1.1 Danger symbols

The following symbols are used in the Operating Instructions to draw attention to possible dangers which may occur when using the pump:

Warning!

This symbol is used in the Operating Instructions to mark all operations where incorrect handling of parts may result in serious injury or death. Follow the instructions closely and proceed with great care.



Attention!

This symbol is used in the Operating Instructions to mark all operations that may cause damage to property or impair operating efficiency. Follow the instructions closely.



Only FI circuit breakers with the symbol shown opposite should be used.



Info!

This symbol is used to mark important or additional information on the machine or documentation.



Environment!

This symbol is used to indicate possible risks to the environment if the instructions are not observed.



1.2 Safety at work



When transporting, assembling, dismantling, operating, servicing and cleaning 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.

In addition, always observe the following safety notes:

- The machine must be used only for its designed purpose and in strict accordance with the manufacturer's instructions.
- The machine should be operated only by reliable persons selected by the contractor, who have received instruction in the operation and maintenance of the machine, and who are familiar with its method of operation.
- The machine must be carefully checked for obvious signs of damage before every shift. In particular, electric cables, plugs, couplings, mortar and air hoses must be checked. Any defects discovered must be repaired before beginning work.
- The safe operating condition of the machine must be checked at least once a year and as required by a person qualified to conduct such inspections. Qualified persons are those who, through training and experience, have sufficient knowledge in the field of mortar-feeding and mortar-spraying machines and are sufficiently familiar with the relevant legislation regarding work safety, accident prevention, directives and generally accepted technical procedures to enable them to assess the safety of the machine.

- If the machine is being lifted with a crane or other lifting gear:
Any material remaining in the mortar trough and the machine must be removed, hoisting equipment with a minimum load-bearing capacity of 100 kg must be used, and the belts must be secured so they cannot slip.
- The machine must be securely positioned on a level surface and secured to prevent it from moving unexpectedly.
- The machine must be positioned in an area where no objects can fall on it from above. If this is not possible, the machine and the area around it must be protected by a roof.
- The work area at the switch cabinet and the area around the pump unit must be easily accessible.
- The machine must be connected to a regulation site distributor box with an FI automatic circuit breaker. The function of the FI circuit breaker must be tested with the machine running before starting work, because the frequency inverter may cause the FI circuit breaker to malfunction.
- Only FI circuit breakers with the symbol shown opposite should be used. Required fuse: 16 A (minimum).
- Ensure that the safety grid is mounted securely on the material trough. Do not reach into the material trough. Do not place any objects in the material trough.
- We recommend installing a hose pressure gauge. This allows the operator to monitor the pressure in the mortar hoses at all times, increases the safety of operating personnel and ensures economical operation of the machine.



- For safety reasons, use only mortar hoses with a permitted operating overpressure of 20 bar and a bursting pressure of at least 60 bar.
- Lay mortar hoses in such a way that they cannot form kinks or be damaged in any way.
- The hose pressure must not exceed 20 bar during operation.
- Before starting up the machine, ensure that the mortar hose is adequately lubricated, that the mortar can be pumped easily and that there are no leaks at the connection points.
- If blockages occur, the machine must be switched off immediately at the double "On/Off" push button.
- If the machine is switched off by the spraying unit, it is still on standby and can be switched on at any time by triggering the spraying unit. Indication: the white lamp on the double "On/Off" push button is on.



For the sake of simplicity, the following sentence is used in these instructions to refer to the above safety note:

When the machine is switched to "standby", it is still ready for operation and can be started remotely at any time. Indication: the white lamp on the double "On/Off" push button is on.

- Always depressurise mortar hoses before uncoupling them. Ensure that they are depressurised. If the hoses are still under pressure, run the machine backwards until they are fully depressurised. Cover the coupling with a tarpaulin before opening it, turn face away and use approved safety goggles. Material may be ejected forcefully.
- Never point the spraying unit at persons.

- If a safety device on the machine has been triggered or has failed, the machine must be stopped until the fault has been remedied.
- The Troubleshooting Table is not intended to replace the detailed instructions in the appropriate sections of the Operating Instructions. Always observe the safety notes in the relevant sections.
- Before working on electrical components, always pull out the power plug, because certain components remain live even when the machine is switched off.
- 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 manufacturer will assume no liability for unauthorised conversion or modifications to the machine.
- To avoid unnecessary loading of the machine and premature wear to the eccentric spiral pump, do not lay out more mortar hoses than are really required.
- If the compressor is not required it must be switched off at the "Off" switch on the compressor.
- Remember the time required for the mortar to set during intervals in the work. At high ambient temperatures and if the interval in work is longer than 30 minutes, the machine and the mortar hoses must be emptied beforehand (see "Finishing work"). When using adhesives, intervals in work must not last longer than 10 minutes.
- All mortar residues removed during cleaning must be properly disposed of in a building waste container.

1.3 Personal safety equipment

- The contractor must supply suitable personal noise-protection equipment if the rated noise level at the work site exceeds 85 dB (A).
- Personnel must use this equipment if the rated noise level exceeds 90 dB (A).
- Always wear safety goggles when removing blockages and during spraying work. Suitable safety goggles must have frames that comply with DIN 58211 (part 2) and the safety lenses must comply with DIN 4647 (sheet 5).
- In addition, always wear a safety helmet and safety shoes or boots during spraying work.

2 Description of the machine

2.1 Intended use

The intended use of the pump consists in pumping premixed materials such as masonry mortar, slit mortar, fine plasters and fillers with grain sizes of up to 2 mm and adhesives with grain sizes of up to 2 mm.

Use of the machine for any other purpose than that described above may cause injury to the operator and damage to the machine and other property. It may prevent the machine from operating efficiently.



2.2 Machine versions

The pump is optionally available with a sack mangle and filler funnel – see section 2.10 “Components supplied”, “Options”

2.3 Method of function

The pump is universally applicable. It can be used for all products that can be pumped, such as spraying fine plaster and applying coatings.

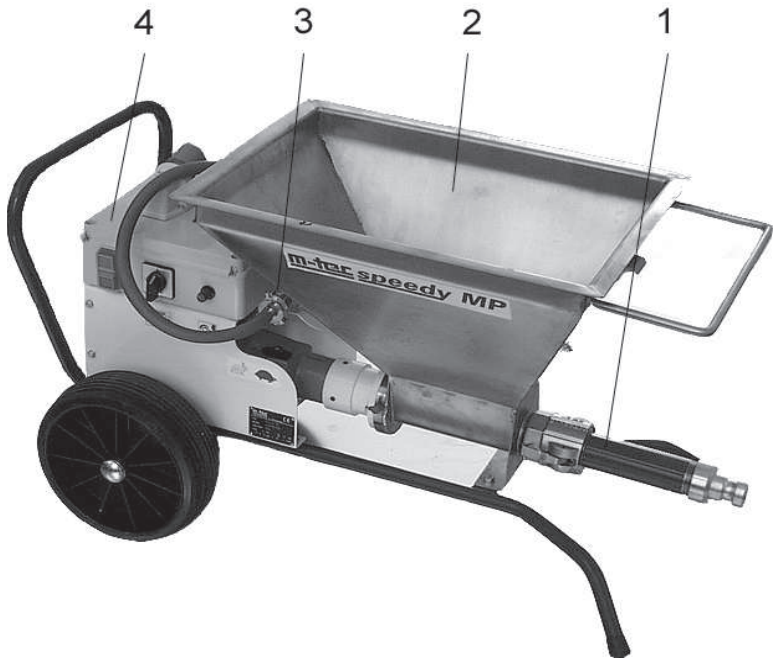
The material trough can be filled directly from standard 10-litre tubs of ready-mixed plaster or from a continuous-flow mixer.

The material is transported from the material trough by a screw pump and pumped to the working area. It is driven by an electrically controlled gear motor with infinitely variable speed.

The pump can be used in combination with a spraying unit when fitted with a compressor (optional).

2.4 Machine diagram

Fig. 1: General view of pump



- 1 Screw pump
- 2 Material trough
- 3 Air fitting
- 4 Controller

2.5 Switch cabinet

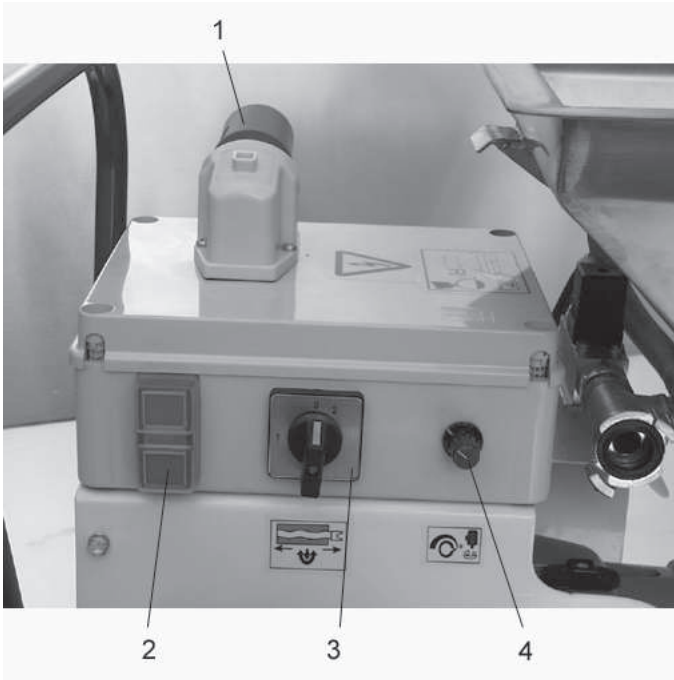


Fig. 2: Switch cabinet

- 1 Input plug 16 A 3-pole 6h
- 2 ON/OFF switch (double push button)
- 3 Toggle switch
"1" operation, "2" reverse
- 4 Speed controller
- 5 Flange-mounted socket, 4-pole
(pressure monitor signal)



2.6 Operating and indicating elements

Double push button (Fig. 2, 2)

In "OFF" position (red) the entire machine is without power; in "ON" position (green) the pump is ready for operation.

Toggle switch (Fig. 2, 3)

When the controller has been switched on with the "ON" double push button, material can be pumped with the toggle switch in position "1" and the pump can be run in reverse in position "2".

Position "2" locking

Position "1" rocking



When the machine is switched to "standby", it is still ready for operation and can be started remotely at any time. Indication: the white lamp on the double "On/Off" push button is on.

Speed controller (Fig. 2, 4)

The speed of the pump motor is infinitely variable with the speed controller.

Mechanical speed control (Fig. 3)

The gearbox speed can be changed mechanically from low or high speed by moving the slide control.



Before changing the speed with the slide control (Fig. 3), the speed control (Fig. 2, 4) must be set to „min“.

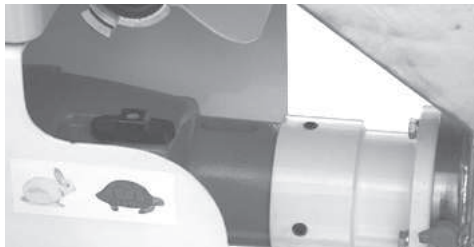


Fig. 3

hare =
high speed

tortoise =
low speed

2.7 General data for the complete machine

Dimensions

Length: 1100 mm

Width: 500 mm

Height: 600 mm

Weight

with accessories approx. 41 kg

Noise level

without continuous-flow mixer: 61 dB(A)*

with continuous-flow mixer: 66 dB(A)*

(* Noise-pressure level at 1 m distance, free-field measurement during operation)

2.8 Technical data, pump unit

DC motor

Voltage: 230 V

Frequency: 50 Hz

Power: 1.8 kW

Rated speed: $n_1 = 60 - 140$ r.p.m.; $n_2 = 200 - 470$ r.p.m.

Speed range via

frequency inverter: infinitely variable

Pumping capacity (based on plasters):

Pumping pressure: up to 20 bar

Flow quantity: 0.5 - 12 l/min

Pumping distance: to 10 m

The pumping quantity, distance and height depend on the material being pumped and on the condition of the rotors and stators used.

During operation, the pressure must not exceed 20 bar (monitor with hose-pressure gauge).



2.9 Air supply (optional)

An additional compressor can be connected to the pump; it supplies the air pressure required for the spraying operation (see "Accessories").

ATTENTION!

If the compressor is not required, it must be switched off at the "Off" switch on the compressor.

2.10 Components supplied

The pump is supplied with the following accessories:

- 1 mortar pump on a mobile frame
- 1 stator incl. matching rotor
- 1 pump-end piece V25
- Hose set NW25, length 10 m with 1/2" air hose
- Hose-pressure gauge V/M25
- Spraying unit with nozzle 6/8/10/12
- Air fitting

Optional sack mangle and filling funnel

A sack mangle or a filling funnel or both together can be installed on the material trough and secured with quick fasteners.

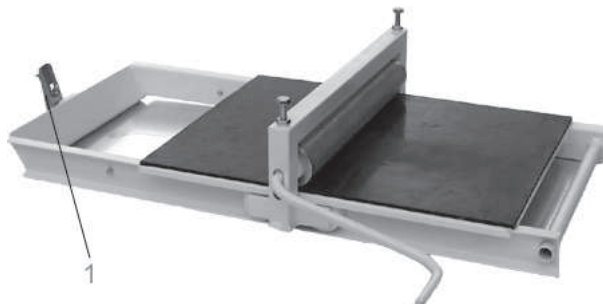


Fig. 6: Sack mangle

1 Quick fastener

Fig. 7: Filling funnel

1 Quick fastener



Fig. 8: Filling funnel and sack mangle installed

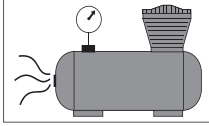
1 Quick fastener

2 Sack mangle

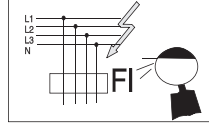
3 Filling funnel

2.11 Markings on the machine

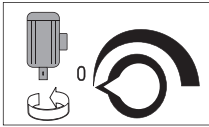
The following symbols on the machine are intended to facilitate operation:



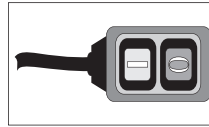
Compressor connection



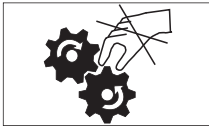
*Connect only via
FI circuit breaker*



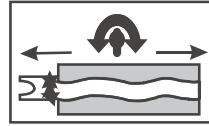
Speed controller



Connection remote control



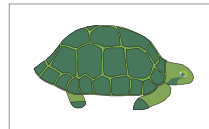
*Pump motor
Warning moving/ rotating*



Direction of rotation screw



*parts
mechanical speed setting
fast*



*pump
mechanical speed setting
slow*

3 Setting up the machine

The machine must be securely positioned on a level surface and secured to prevent it from moving unexpectedly.



The machine must be positioned in an area where no objects can fall on it from above. If this is not possible, the machine and the area around it must be protected by a roof.

The work area at the switch cabinet and the area around the pump unit must be easily accessible.

4 Start-up



The operator must carefully inspect the machine for obvious defects at the start of every shift. Particular attention must be paid to electric cables, plugs, couplings, mortar hose and air hoses.

Always observe the accident-prevention regulations in force as well as all other generally accepted work-safety and work-health regulations.

4.1 Power connection



The machine must only be connected to a regulation site distributor box with an FI automatic circuit breaker. Before use, the function of the FI circuit breaker must be tested while the machine is running, because the frequency inverter may cause the circuit breaker to malfunction.



Only FI circuit breakers with the symbol shown opposite should be used.

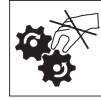
Mains voltage	230 V
Frequency	50 Hz
Phases	1
Connection cable	3 x 2.5 mm ² with safety plug and socket 16 A 3-pole 6h
Pre-fuse	16 A



Fig. 4: Power connection

4.2 Checking direction of motor rotation

***Do not reach into the machine while it is running;
danger of serious injury.***



- Set main switch to “1” and switch on the machine at the double push button “On/Off”
- Observe the screw in the material trough:
after switching on the machine the screw must rotate to the left

4.3 Assembling the screw pump



Take great care when assembling the screw pump!

The screw pump consists of a rotor (Fig. 5, 1) and a stator (Fig. 5,2).

- Spray rotor with lubricant spray
- Clamp the stator, e.g. in a vice
- Screw the rotor into the stator with a tool (e.g. open-ended spanner inserted into the rotor groove) until the rotor head projects 38 mm out of the stator

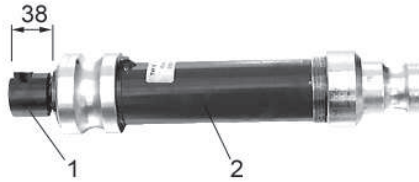


Fig. 5: Assembling the screw pump

- 1 Rotor
- 2 Stator

4.4 Connecting the mortar hoses

For safety reasons, use only mortar hoses with a permitted operating overpressure of 20 bar and a bursting pressure of at least 60 bar.



To avoid unnecessary loading of the machine and premature wear to the screw pump, do not lay out more mortar hoses than are really required.

ATTENTION!

- Couple mortar hoses securely to one another
- Connect mortar hose securely to pump end piece

4.5 Connecting the spraying unit

When the machine is switched to "standby", it is still ready for operation and can be started remotely at any time. Indication: the white lamp on the double "On/Off" push button is on.



Never point the spraying unit at persons.

Spraying is only possible when an optional compressor is fitted.



- Connect the power cable of the compressor to a separate power source
- Connect air hose and air fitting to the compressor
- Connect the long compressed air hose (Geka coupling at both ends) to the Geka coupling of the spraying unit and the Geka coupling of the air fitting
- Connect the spraying unit to the mortar hose

4.6 Flushing the hoses



Flush the mortar hoses with slurry before normal use to prevent blockages. With plasters and mortar or adhesives, use lime slurry or paste.

- Fill the material trough with approx. 6 l of lime slurry or paste
- Switch on the pump with the toggle switch (Fig. 2, 3) and allow it to run until the lime slurry or paste in the mortar hose has been fully pumped out
- Switch off the controller with the double "On/Off" push button

5 Operation

The operator must carefully inspect the machine for obvious defects before every shift. Particular attention must be paid to electric cables, plugs, couplings, mortar hose and air hoses.



Always observe the accident-prevention regulations in force as well as all other generally accepted work-safety and work-health regulations.

The machine must only be switched on and off with the toggle switch, the spraying unit or the glue gun.

ATTENTION!

5.1 Filling with material from bucket

- Fill material that can be pumped into the material trough through the screen

The material is mixed once again in the material trough.

5.2 Filling from continuous-flow mixer

Follow the operating instructions of the continuous-flow mixer.

Before filling the pump, adjust the material consistency at the continuous-flow mixer



ATTENTION!

5.3 Pumping

- Press double "ON" push button (green)
- Switch on machine with the toggle switch at position "1"

5.4 Spraying with a spraying unit



When the machine is switched to “standby”, it is still ready for operation and can be started remotely at any time. Indication: the white lamp on the double “On/Off” push button is on.

Never point the spraying unit at persons.

- Ensure that the compressor is switched on
- Ensure that the air hose from the spraying unit is coupled to the air fitting
- Ensure that the air valve on the spraying unit is closed
- Set toggle switch to “1”
- Switch on the machine with the double “On/Off” push button

The machine is now ready for operation, i.e. it is in “standby” mode. It will only run when the air valve on the spraying unit is opened.

As soon as the air valve on the spraying unit is closed again, the machine switches to “standby” mode.

5.5 Removing blockages



If a blockage occurs, switch the machine to “0” with the toggle switch.

- Set toggle switch to “2” (rocker setting)



Ensure that the mortar hoses are depressurised! Check the pressure on the hose pressure gauge.

Always depressurise mortar hoses before uncoupling them.

Switch off the machine with the double "On/Off" push button and set main switch to "0".

Cover the mortar hose coupling with a tarpaulin when opening it, turn face away and use approved protective goggles. Material may be ejected forcefully.

- Cleaning mortar hoses - see "Cleaning" section
- Reassemble mortar hoses securely

5.6 Intervals

The machine must only be switched on and off with the double "ON/OFF" push button.

ATTENTION!

During intervals the setting time of the processed materials must be kept in mind.

At high ambient temperatures and intervals of more than 30 minutes the machine should be discharged.

5.8 Finishing work

- Run the machine until the material trough and mortar hoses are empty
- Switch off the machine with the double push button "On/Off"
- Set "Forward/Reverse" rocker switch to "Reverse"
- Switch on the machine with the double "On/Off" push button and run it until the mortar hoses are completely depressurised



***Ensure that the mortar hoses are depressurised!
Check the pressure on the hose pressure gauge.***

Always depressurise mortar hoses before uncoupling them.

• Switch off the machine with the double “On/Off” push button and set main switch to “0”.

Cover the mortar hose coupling with a tarpaulin when opening it, turn face away and use approved protective goggles . Material may be ejected forcefully.

- Uncoupling mortar hoses
- Switch off compressor if necessary
- Cleaning mortar hoses - see “Cleaning” section

6 Cleaning

Mortar residue must be disposed of properly when cleaning the machine.



6.1 Cleaning the material trough and screw pump

- Fill material trough with water
- Switch controller "ON" with double push button
- Set toggle switch to "1" and run the machine until clean water comes out of the pump end piece

Switch off the machine with the double "On/Off" push button and set main switch to "0"



- Remove and clean pump end piece
- Replace pump end piece

6.2 Cleaning mortar hoses

- Insert a foam-rubber ball into the mortar hose
- Couple mortar hose to a water tap with the M35/GEKA reducing adaptor
- Turn on the tap and allow the water to run until the rubber ball emerges at the other end of the hose
- Repeat the process until clean water emerges from the hose



6.3 Cleaning the spraying unit

Follow the operating instructions for the spraying unit.

7 Troubleshooting



The Troubleshooting Table is not intended to replace the detailed instructions in the appropriate sections of the Operating Instructions. Always observe the safety notes in the relevant sections. Modifications to the machine are not authorised. Use only spare parts and accessories supplied by m-tec mathis technik gmbh. m-tec mathis technik gmbh does not accept liability for any accidents resulting from the use of non-approved spare parts or accessories.

7.1 Problems during start-up

Problem	Cause	Remedy
Pump motor does not start	No power Circuit breaker defective/triggered	Check fuses, cables Check circuit breaker
Pump does not start	Screw pump is stuck	Use the toggle switch "Forward/Reverse" to run the pump backwards and forwards in short bursts
not in the correct end position	Mechanical speed setting end position	Move slide controller in the
	Motor overloaded	Allow motor to cool

7.2 Problems during operation

Problem	Cause	Remedy
Internal motor fuse trips	Consistency too thick Pump end piece blocked	Adjust consistency Clean pump end piece
Motor circuit breaker on compressor always trips	Inlet filter contaminated, making compressor hot	Clean inlet filter Replace if necessary

8 Maintenance



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

m-tec mathis technik gmbh does not accept any liability for damage caused by neglect of maintenance and lubrication requirements.

8.1 General care and maintenance operations

- Check the machine for visible defects before every shift, particularly all hose and cable connections
- Regularly remove mortar residue from all parts of the pump
- Clean the filter on the compressor (if present) regularly; change the filter if it is very contaminated

8.2 Monitoring and testing

The safe operating condition of the machine must be checked at least once a year, or as required, by a person qualified to conduct such inspections.

Qualified persons are those who, through training and experience, have sufficient knowledge in the field of mortar-feeding and mortar-spraying machines and are sufficiently familiar with the relevant legislation regarding work safety, accident prevention, directives and generally accepted technical procedures to enable them to assess the safety of the machine.

Compressors and air tanks are subject to the relevant valid test requirements of the compressor safety regulations and the pressure tank regulations.

9 Spare parts/accessories

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 manufacturer will assume no liability for unauthorised conversion or modifications to the machine.

Please send your orders to:

m-tec mathis technik gmbh:

Tel. no.: +49 / 7631 / 709-112 or -216

Fax: +49 / 7631 / 709-116

10 Circuit diagram

X1	CEE plug
X2	Flange-mounted socket, 4-pole
X3	Drive terminals
K1	"ON" / "OFF" contactor
K2	Auxiliary relay
S1	"ON" / "OFF" button
S2	"Forward" / "Reverse" toggle switch
S4	Remote control
H1	Signal lamp Machine is "ON"
R1	Speed potentiometer
M1	Pump motor

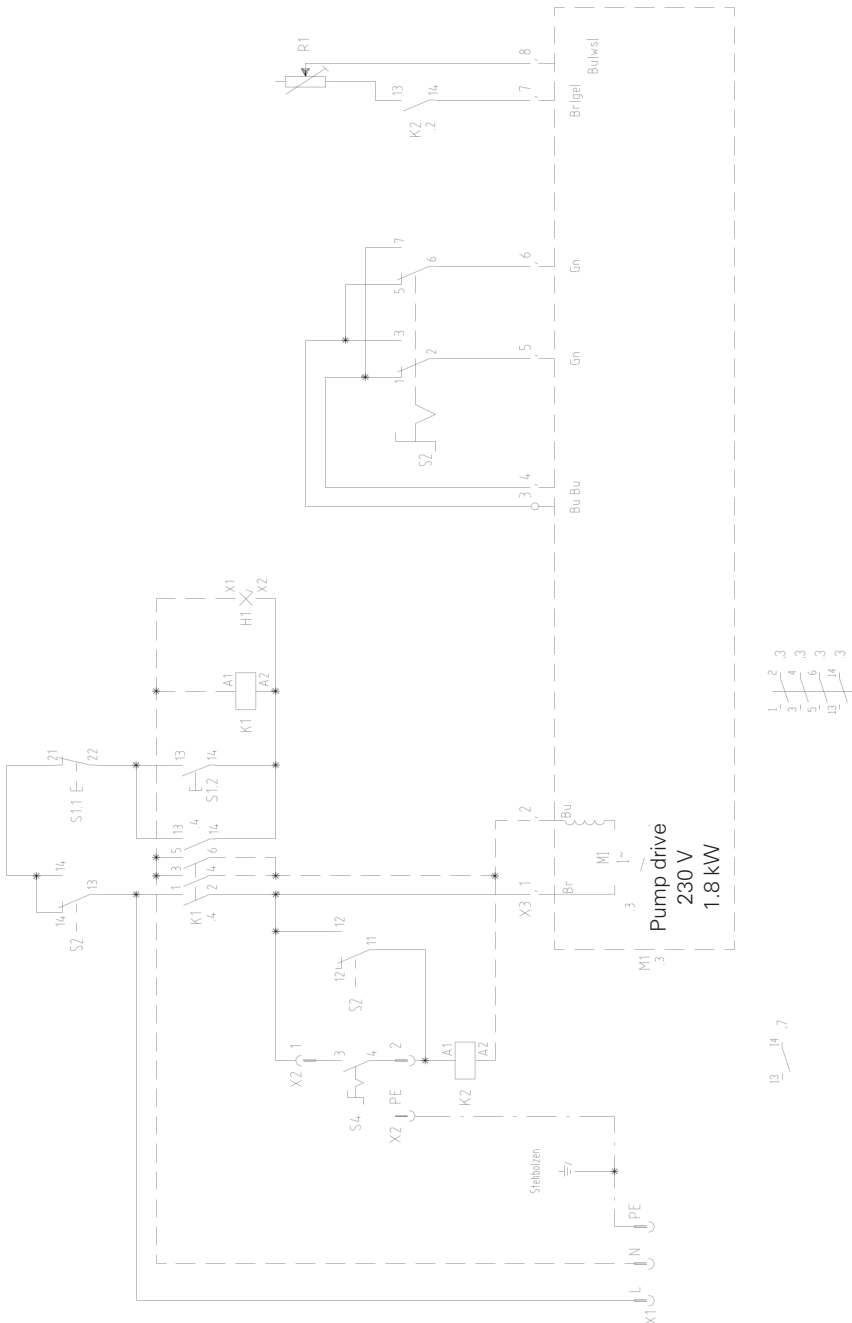


Fig 9: Circuit diagram (art-no. 391314-08.04.02)

