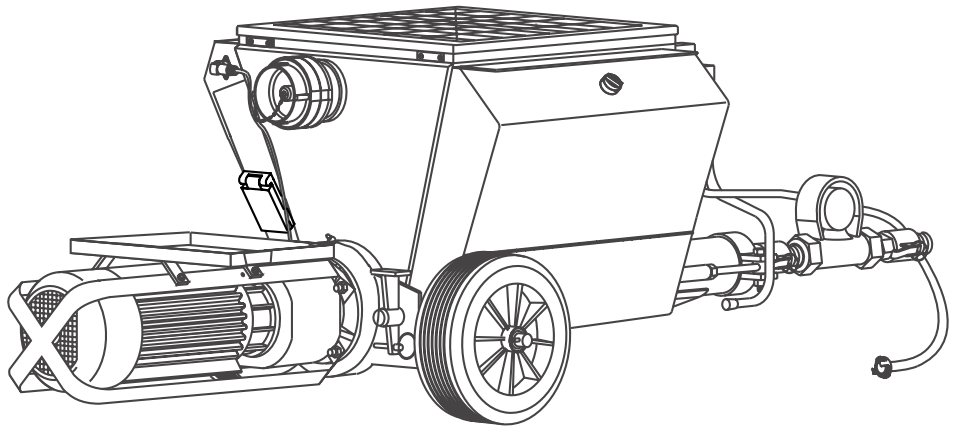
# Operating Instructions

## Pump
## speedy P20V

**230V 60Hz 2ph**



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# 10 Circuit Diagram

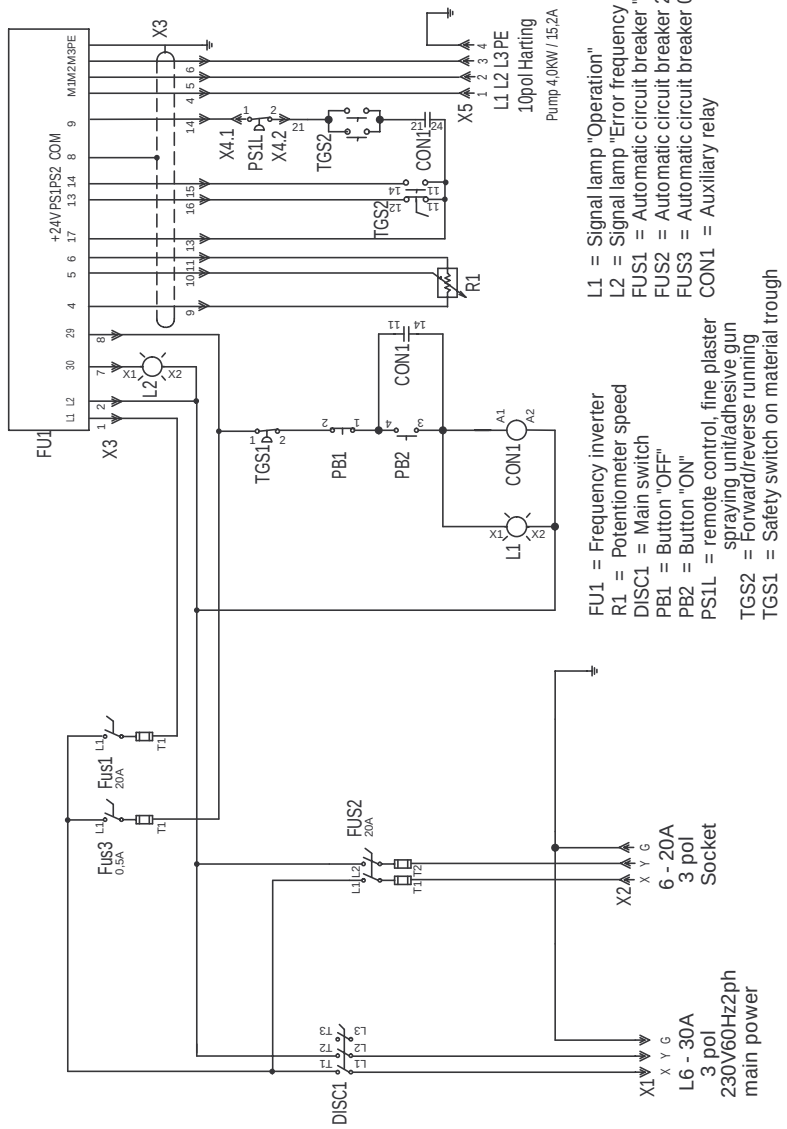


*Fig. 13: Circuit diagram*

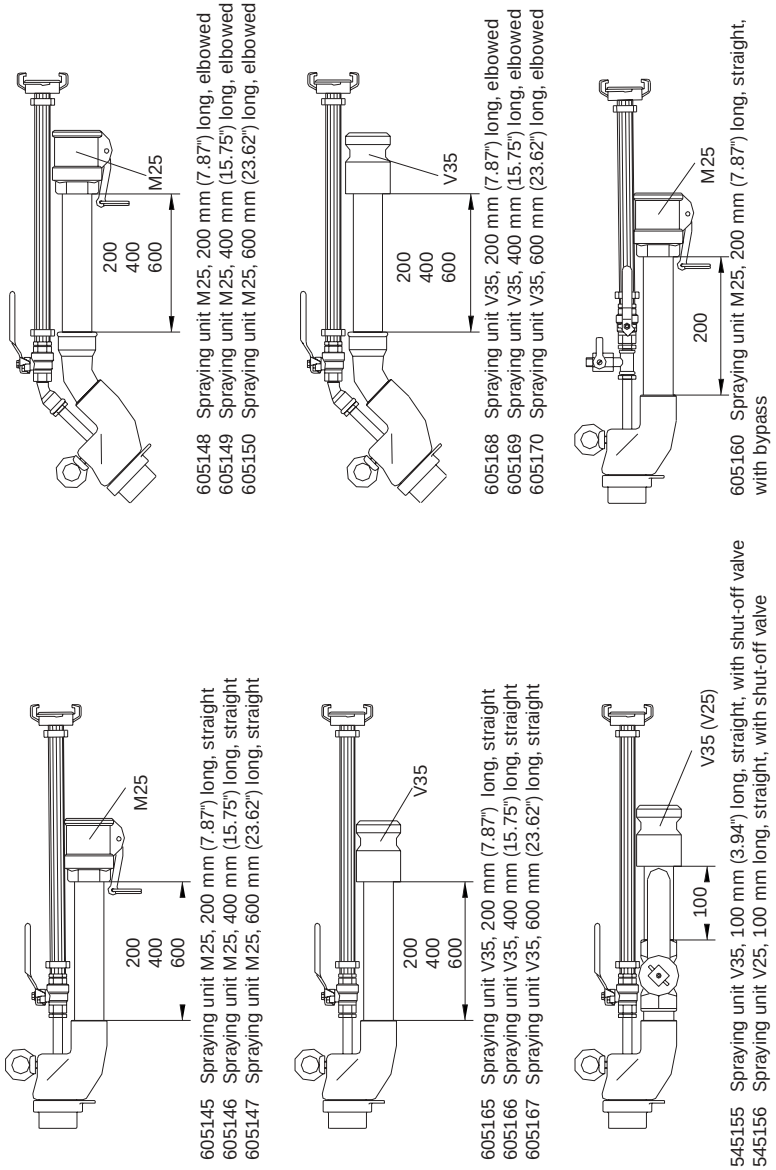


*Fig. 12: Spraying units*



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# Dear Customer,

this machine represents the current technical state of the art and complies fully with general standards and EC guidelines. This is indicated by the CE symbol 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 up, fill in the information required on this page. This is the easiest way to familiarize yourself with the characteristics of the machine, and the main data can be consulted at any time without reading them off the machine plate. If you wish to consult us at any time, please have the information on this page ready at hand. 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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- Foam-rubber ball D = 35
- Closing cover
- 2" hose with C couplings
- Filling funnel
- Extruder

# 9 Spare Parts / Accessories

**WARNING**

***Death or serious injury or damage to the machine itself or to other property could occur when***

***- using spare parts and accessories not supplied by m-tec mathis technik gmbh or when***

***- modifying the machine.***

***Use only spare parts and accessories supplied by m-tec mathis technik gmbh.***

***The manufacturer will assume no liability for any accidents or damage caused by the use of spare parts and accessories of other types or unauthorized modification or conversion of the machine.***

To place orders for spare parts and accessories, please contact:

**m-tec mathis technik gmbh**
Tel. no.: +49 / 7631 / 709 -112 or -216
Fax: +49 / 7631 / 709 -116

With original accessories from m-tec mathis technik gmbh the performance of the pump speedy P20V can be increased considerably. The following accessories are available from m-tec mathis technik gmbh:

- Mortar hose ND 35 V35/M35, 13.3 m (43.64 ft) long
- Mortar hose ND 25 V25/M25, 10.0 m (32.81 ft) long
- Air fitting
- Remote-control cable 50 m (164 ft)
- Adhesive gun
- Fine-plaster spraying unit, type Integra
- Air hose 1/2", 11 m (36.1 ft)
- Various spraying units (see p. 62)
- Foam-rubber ball D = 45

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# 1 Safety

## 1.1 Warning Symbols and Hazard Categories

In these Operating Instructions and according to the standards defined in ANSI Z535.1-5, the following hazard categories are used to draw attention to possible dangers which may occur when using the Pump speedy P20V.

Depending on the seriousness of the hazard, the messages are divided into five hazard categories.

The signal words communicate the level of hazard seriousness.

**DANGER**

***indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.***

**WARNING**

***indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.***

**CAUTION**

***indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injuries.***

**CAUTION**

***is used without safety alert symbol to indicate a potentially hazardous situation which, if not avoided, may result in property damage.***



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## 8.3 Monitoring and Testing

**WARNING**

***Damage to the machine or parts of it could cause personal injury, electrocution etc.***

***Before every shift, the machine must be carefully inspected by the foreman for obvious signs of damage or defects, in particular to electric cables, plugs, couplings, mortar hoses and air hoses.***

***Any damage must be repaired before starting the machine.***

When required, the safety of the machine must be verified by a person qualified to make such inspections. The inspection must however be carried out at least once per year. Qualified persons are those who, through training or experience, have sufficient knowledge in the field of mortar-feeding and mortar-spraying machines and who are sufficiently familiar with legislation regarding safety, accident prevention, guidelines and general technical procedures to allow them to assess the safe condition of the machine.

Compressors and air vessels are subject to their own testing and accident-prevention regulations.

If the recommended oil or grease type is not available, the following lubricants may also be used:

**Grease charge:**
Aral FDP 00
BP Energrease HTO
Esso Fibrax EP-370
Mobil Mobilplex 44
Shell Special Gear Grease H
Mobil Mobilgear 630

**Oil charge:**
Aral Degol BG 220
BP Energol GR-xP 220
Calypsol Bison Oel MSR 114
Esso Sparton EP-220
Houghton Molygear 115
Shell Omala 220



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### NOTICE / ATTENTION

***is used without safety alert symbol to indicate a potential situation which, if not avoided, may result in an undesirable event or state.***

The signal word is accompanied by a pictogram which can be of different shape to emphasize the kind of hazard. It is followed by a statement of the hazard, the probable consequence of involvement with the hazard and how the hazard can be avoided.

Further symbols and signal words used in these Operating Instructions:

### FI CIRCUIT BREAKER

***This symbol points out that only FI circuit breakers with the symbol shown opposite should be used.***

### ENVIRONMENTAL HAZARD

***This symbol points out that environmental regulations must be observed.***

### INFORMATION / NOTE

***This symbol draws your attention to important or additional information relevant to the machine or documentation.***

### EYE PROTECTION

***This symbol points out that safety goggles must be worn.***

***The frame of the goggles must comply with the standard DIN 58211 (part 2) and the safety lenses with DIN 4647 (sheet 5).***

## 1.2 General Safety Instructions

**DANGER**

***Follow these safety instructions carefully. Failure to do so may result in increase of risk of accident or injury. These safety instructions must always be adhered to when transporting, assembling, operating, maintaining or disassembling this machine. These safety instructions apply to the instructions throughout this manual, and must be applied to all facets of the machine's use, including, but not limited to, transport, assembly, operation, maintenance or disassembly.***

***The pump speedy P20V has a state-of-the-art design, it is reliable in operation and it has left the factory in perfect condition. Nevertheless, it can pose a danger if it has been installed improperly or contrary to directions (see Chapter 3 and 4), or it is operated by untrained personnel.***

***In order to protect the machine from damage and enable personnel to operate it properly and safely every operator must observe the following instructions before starting up the machine:***

- ***Read and understand the Operation and Service Manual and familiarize with how the machine is operated. The chapter on "Safety" is particularly important.***
- ***Observe the pertinent accident prevention regulations as well as other generally recognized rules and regulations pertaining to industrial safety and medical care.***
- ***Ensure that any difficulties are resolved before starting up the machine (see manufacturer's address on the back of the cover).***





## 8.2 Oil Change

**ATTENTION**

***Non-compliance with lubricating instructions will automatically invalidate the guarantee.***

***Do not top up with oil between changes. Overfilling with oil may cause overheating.***

***Do not mix different types of oil as this may cause the lubricant to decompose.***

***Non-compliance with lubricating instructions will invalidate the guarantee.***

**ENVIRONMENTAL HAZARD**

***Always observe environmental regulations when disposing of oil, grease or cleaning agents.***

The electric motor and the gear unit are supplied ready for operation and are maintenance free up to 8000 hours of operation. After every 8000 hours of operation, the gears must be cleaned using a suitable flushing oil and then checked.

For lubricant change, we recommend:

- **for gears: Shell Tivela Oil 82, quantity 800 cc (0.21 gal. (48.8 cu in))**
- **for roller bearings in gear unit: grease charge Aral Aralub HL 3, charge bearing compartment 1/3 with grease.**

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# 8 Care and Maintenance

**WARNING**

***Danger of electrocution as certain components remain live even when the machine is switched off.***

***Before working on electrical components, always pull out the power plug.***

## 8.1 Maintenance of the Pump speedy P20V

- Always remove mortar residues from conveyor and eccentric screws, pump end piece and material trough
- Fill the rubber collar over the grease nipple (see fig. 11) regularly with a grease gun
- The filters on the compressor must be cleaned regularly. Replace the filter when it becomes too dirty

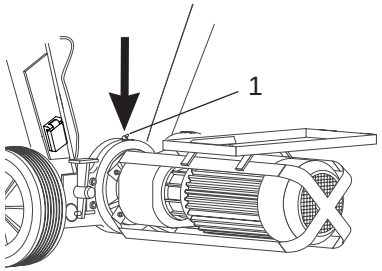


*Fig. 11: Lubrication of rubber collar*

*1 Grease nipple*





***The Operation and Service Manual must always be kept in the specially designed pocket on the machine, so that it will be accessible to all machine operators at all times. All personnel operating or servicing the machine must be told where to find this Manual.***

***Modifications of the machine are not permitted. All replacement parts, accessories and lubricants must be furnished by m-tec mathis technik gmbh. The use of unauthorized parts, accessories or lubricants may result in death or serious injury, may cause damage to the machine and will nullify all liability on the part of the manufacturer for resultant damage.***

***Wear proper personal protective equipment, including, but not limited to, eye and hearing protection at all times while operating machinery. Keep hands, feet, hair and clothing away from all moving parts of the motor to prevent risk of serious injury. Avoid wearing loose-fitting clothing or jewelry when near the motor, and secure long hair in order to keep it away from moving parts.***

***This machine must be operated in compliance with all applicable federal, state and local laws, regulations, and ordinances at all times. This includes, but is not limited to, the requirements of TITLE 29 of the CODE OF FEDERAL REGULATIONS, PART 1926 (29 CFR 1926). Failure to operate this machinery in compliance with all applicable laws, regulations, and ordinances may result in death or serious injury.***

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***The proper use of this machinery requires that the operator be in full control of the machinery at all times. None of this equipment must be used by an operator that is under the influence of alcohol or drugs, including prescription drugs that may impair an operator's ability to safely operate this equipment. Failure to adhere to this requirement may result in death or serious injury.***

## 1.3 Intended Use

The intended use of the Pump speedy P20V consists in pumping previously-mixed materials such as masonry mortars, slit mortar, fine plasters and fillers with grain sizes of up to 5 mm (0.197") and adhesives with grain sizes of up to 3 mm (0.118").

**DANGER**

***Use of the machine for any other purpose than that described above, may result in bodily or even fatal injury, damage to the machine itself or to other property.***

***It may also impair the efficient functioning of the machine.***

***Use of the machine for any other purpose than that described above is prohibited!***

## 1.4 Target Group

This document is intended for personnel carrying out start–up, operation and maintenance of the machine. Such personnel must be qualified according to specifications stated in chapter 1.5.



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## 7.4 Problems when using the Adhesive Gun (optional)

| Problem | Cause | Remedy |
|---|---|---|
| Material does not flow from adhesive gun | Adhesive gun clogged<br>Limit switch defective | Clean adhesive gun<br>Check or replace limit switch |
| Material flow does not seal off when closed | Trigger mechanism dirty | Clean trigger mechanism |
| | Encrustation between nozzle and sealing lock | Clean adhesive gun |
| | Wear on sealing lock | Replace sealing lock |

## 7.5 Problems with Frequency Inverter

When a fault occurs with the frequency inverter, the red warning lamp on the switch cabinet lights up. The machine does not start.

| Cause | Remedy |
|---|---|
| Overload protection triggered (consistency too thick, too many hoses laid out) | Set consistency, reduce hose length |
| Machine switched off and on too often with main switch (see page 41, 42) | Switch machine off only at remote control, pressure monitor or double push button |
| Frequency inverter overheated, cooler defective | Replace or repair cooler on frequency inverter |

After all alarm signals, wait for approx. 1 minute before the frequency inverter is again ready for operation.

## 7.2 Problems during Operation

| Problem | Cause | Remedy |
|---|---|---|
| Circuit breaker triggers | Consistency too thick | Adjust consistency |
| | Pump end piece clogged | Clean pump end piece |

## 7.3 Problems during Spraying (optional)

| Problem | Cause | Remedy |
|---|---|---|
| Pump motor does not start (with connected compressor) | Air hose jammed | Check air pipeline |
| | Air nozzle clogged | Clean nozzle |
| | Air-pressure monitor set too low | Set pressure monitor to 1.4 - 1.8 bar (20.3 - 26.1 psi) switch-off pressure |
| Pump cannot be switched off with air | Compressor safety valve does not close | Release safety valve |
| | Safety valve set too low | Set valve to 3.2 - 3.5 bar (46.4 - 50.75 psi) |
| | Air-pressure monitor set too high | Set pressure monitor to 1.4 - 1.8 bar (20.3 - 26.1 psi) switch-off pressure |
| | Compressor produces too little air | Check membranes and valve plates and replace if necessary |
| Motor-protection switch on compressor always fails | Intake filter clogged, compressor heats up | Clean or replace intake filter |



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## 1.5 Qualified Personnel

**DANGER**

***Start–up, operation and maintenance of the machine carried out by unqualified personnel, may result in bodily or even fatal injury, damage to the machine itself or to other property.***

***Start–up, operation and maintenance of the machine may only be carried out by qualified personnel.***

***It is the duty of the operator to ensure that operating staff has read and understood the operating manual, in particular the chapter "Safety", and that it is sufficiently qualified for operating the machine.***

Qualified persons are those who, through training or experience, have sufficient knowledge in the field of mortar-feeding and mortar-spraying machines and who are sufficiently familiar with legislation regarding safety, accident prevention, guidelines and general technical procedures to allow them to assess the safe condition of such machines.

## 1.6 Instructions Book

**ATTENTION**

***In order to allow the user to consult the operating instructions for the Pump speedy P20V whenever required it must be kept on the machine at all times.***

All persons involved in operating the machine must read the operating instructions, 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 familiarize themselves with the operation and controls of the pump. This prevents damage and injury and ensures efficient working with it.

## 1.7 Safety at Work

**DANGER**

***When disregarding safety regulations, secure operating conditions are not guaranteed.***

***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.***

**DANGER**

***Nonobservance of the following safety instructions and notes will result in damage to the machine or equipment or even in death or serious injury.***

***Always observe the following safety instructions!***

- The operating instructions for the Pump speedy P20V must be kept on the machine at all times to allow the user to consult them whenever required.
- When working with the machine, always observe the special safety regulations applicable to mortar-spraying machines.
- The machines must be used only for the intended purpose in strict compliance with the manufacturer's instructions.



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# 7 Troubleshooting

**WARNING**

***To prevent death or serious injury, damage to the machine itself or to other property, always comply with the safety notes in each section of these Operating Instructions!***

***This trouble shooting table is not intended to replace the detailed instructions in the appropriate sections.***

## 7.1 Problems before Start-up

| Problem | Cause | Remedy |
|---|---|---|
| Pump motor does not start | No power | Check fuses, cable |
| | Material trough safety grid open | Replace safety grid |
| | Defective safety switch/ safety switch triggered | Check safety switch, or replace safety switch |
| Pump does not start | Spiral pump stuck | Allow pump to run backwards and forwards several times (jogging mode) |
| | Fault in frequency inverter through switching on and off at main switch | See page 41, 42<br>Main switch |
| | Remote control cable of air-pressure monitor or adhesive gun not connected at switch cabinet | Connect control cable |
| | Earth conductor not connected | Connect earth conductor |

## 6.5 Cleaning the Adhesive Gun

**WARNING**

***Nonobservance of the operating instructions for the adhesive gun could result in damage to the machine or equipment or even in death or serious injury.***

***Always follow the instructions for the adhesive gun!***

- Remove adhesive hose at outlet of gun and connect water hose with GEKA coupling
- Remove mortar hose from the adhesive gun
- Pressurize water hose (min. 3 – 6 bar / 43.5 – 87 psi) and operate trigger several times until clear water emerges

**ATTENTION**

***In order to keep the adhesive gun in good working condition, the following operations must be carried out every day after finishing work.***

- Remove nozzle with key a/f 30 and clean interior well. Then clean the whole gun
- As soon as the gun is dry, spray it with light oil (e.g. art. no. 545089)
- Re-assemble the gun and spray it again with oil

## 6.6 Cleaning 2"-Hose with C-Couplings / Filling Funnel

- Uncouple filling funnel and 2" hose with C coupling and clean thoroughly with water



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- The machine must be operated only by qualified and reliable persons selected by the building contractor, who have received instruction in the operation and maintenance of the machine, and who are familiar with its method of function.
- If the machine is being lifted by a crane or other lifting gear, any material remaining in the mortar trough and machine must be removed beforehand. Hoisting equipment with a minimum load-bearing capacity of 400 kg (880 lbs) must be used, and the belts fastened in such a way that they cannot slip.
- 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. 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.
- When filling from a continuous-flow mixer, ensure that the safety grid is mounted securely on the material trough of the pump. Do not put your hands into the material trough. Do not place objects in the material trough.
- The machine must be connected to a regulation site distributor box with FI automatic circuit breaker. Before use, the function of the FI circuit breaker must be tested while the machine is running, as the frequency inverter may cause the FI circuit breaker to malfunction.

- Before every shift, the machine must be carefully inspected for obvious signs of damage or defects, in particular to electric cables, plugs, couplings, mortar hoses and air hoses. If any such damage of defects are noticed, these must be corrected before beginning work.
- When starting the machine up, ensure that the mortar hose is adequately lubricated beforehand, that the mortar is easily pumpable and that any leaks at connection points are avoided.
- Lay mortar hoses in such a way that they cannot form kinks or be damaged in any way.
- During operation, the pressure of 40 bars (580 psi) must not be exceeded. For safety reasons, use only mortar hoses with a permitted operating overpressure of 40 bars (580 psi) and a bursting pressure of at least 120 bars (1740 psi).
- We recommend using a hose pressure gauge as an additional safety precaution for operating personnel.
- If blockages occur, the machine must be switched off immediately at the double push button “On/Off”.
- Always depressurize mortar hoses before uncoupling them. Ensure that they are depressurized. If the hoses are still under pressure, run the machine backwards until they are fully depressurized. Before opening, cover the coupling with a tarpaulin. Wear regulation goggles and do not face the coupling directly, as material may be ejected forcefully.
- Should any safety device on the machine trigger or fail, stop the operation of the machine until it has been corrected.



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## 6.3 Cleaning the Mortar Hoses

**ATTENTION**

***As cleaning tools depend on hose diameter, mortar hoses of differing diameters must be cleaned separately.***

- Select the adequate foam-rubber ball for the hose diameter
- Push the foam-rubber ball into the mortar hose
- Couple the mortar hose to the cleaning tap with the reducing adapter M35/GEKA
- Turn on the cleaning tap and allow the water to flow until the foam-rubber ball emerges from the end of the mortar hose
- If necessary, repeat the process until clean water emerges from the mortar hose

## 6.4 Cleaning the Spraying Unit

- Uncouple mortar hose from spraying unit
- Uncouple air hose from spraying unit
- Flush spraying unit with water

## 6.2 Cleaning the Pump speedy P20V

If an extruder is installed between material trough and spiral pump, this is also cleaned by the process described below.

**WARNING**

***Moving parts can crush and cut.***

***Before working on the pump, switch it off at double push button "On/Off" and set main switch to "0".***

- Remove the C coupling on the emptying pipe of the material trough and clean it and the conveyor screw with water. Re-install the C coupling on the emptying pipe
- Fill the bottom of the material trough with water
- Switch main switch to "1"
- Set toggle switch "Forward/back" to "Forward" and switch on pump at double push button "On/Off"
- Allow the pump to run in the forward direction until clean water emerges from the pump end piece

**WARNING**

***Moving parts can crush and cut.***

***Before working on the pump, switch it off at double push button "On/Off" and set main switch to "0".***

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



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- Before starting the machine, set the potentiometer to maximum setting in order to avoid overloading the motor if the material is too thick. The speed can then be increased again.
- From a speed of 224 r.p.m. (Set value on potentiometer approx. 80 %) the torque of the pump declines. This may cause blockages or overloading of the motor if the material is too thick.
- If the machine is switched off by means of the remote control, spraying unit or the adhesive gun, it is still on standby and can be switched on by triggering the remote control, spraying unit or adhesive gun. This is signalized by a white lamp lighting up on the double push button "On/Off".

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

If 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 "On/Off" button lights up.

- Never point the spraying unit or the adhesive gun at persons!
- The Troubleshooting Table is not intended to replace the detailed instructions in the appropriate sections of these Operating Instructions. Always comply with the safety notes in each section!
- Before doing maintenance work on the machine, always pull out the power plug, as certain components remain live even when the machine is switched off.

- The manufacturer will assume no liability for damage or injury caused by unauthorized alterations or conversions to the machine.
- 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.
- To avoid unnecessary loading of the machine and premature wear to the eccentric spiral pump, do not lay out more mortar hoses than are actually required. With mortar hoses of type ND 25, the reducing adapter V35/V25 must be used.
- The machine must be switched on and off only at the double push button “On/Off”, the remote control or by means of the spraying unit or the adhesive gun. If the pump is switched off repeatedly at the main switch, the frequency inverter may malfunction.
- If the compressor is not required, it must be switched off at the “Off” switch on the compressor.
- The flange surfaces on the material trough and the spiral pump must be clean. Always comply with the instructions for installation on the stator.
- The flange surfaces on the material trough, extruder and spiral pump must be clean.
- During intervals in work, remember the time required for the mortar to set. When using adhesive, intervals in work should not normally exceed 10 minutes. At high temperatures, the material sets more quickly.



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# 6 Cleaning

**ENVIRONMENTAL HAZARD**

***Mortar residues removed during cleaning must be properly disposed of in a regulation building rubble container.***

## 6.1 Uncoupling Mortar Hoses

- Switch off pump at double push button “On/Off”
- Set toggle switch “forward/back” to “back” and switch on pump at double push button “On/Off”
- Allow the pump to run in reverse until the mortar hoses are fully depressurized
- Switch machine off at double push button “On/Off” and set main switch to “0”.

**WARNING**

***Hose couplings or material could be projected forcefully when opening hose couplings.***

***Before opening the couplings:***

***- make sure that the machine is switched off and that mortar and hoses are fully depressurized,***

***- wear regulation goggles,***

***- check pressure on hose pressure gauge and cover couplings with a tarpaulin.***

***Do not face the coupling directly when opening it.***

- Uncouple mortar hoses

## 5.8 Finishing Work

- Allow the pump to run until the material trough and the mortar hoses are empty
- Switch machine off at double push button “On/Off”
- Set main switch to “0”
- If necessary, switch compressor off
- Clean machine (see section 6.2 ff.)

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- Overfilling the gear unit and motor with lubricant may cause overheating. Do not mix different types of oil and grease. Disregarding the lubrication requirements will automatically invalidate the guarantee.

## 1.8 Personal Safety Equipment

**WARNING**

***Nonobservance of the following safety instructions could result in serious injury.***

***Always observe the following safety instructions!***

- The proprietor/operator of the machine must supply personal noise-protection equipment for personnel using the machine if the noise level at the place of work exceeds 85 dB (A).
- If the noise level at the place of work exceeds 90 dB (A), the use of this equipment by personnel is compulsory.
- Always wear safety goggles when removing blockages and during spraying work.
- The frame of the goggles must comply with the standard DIN 58211 (part 2) and the safety lenses with DIN 4647 (sheet 5).
- During spraying work, always wear a safety helmet and safety shoes or boots.

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# 2 Description of the Machine

## 2.1 Method of Function

The pump speedy P20V is universal in application. It can be used for all products capable of being pumped and machine-processed such as masonry mortar, plaster renderings, adhesives, slit mortars etc.

The material can be supplied to the material trough by a continuous-flow mixer. From there, the material is transported to the eccentric spiral pump by a conveyor screw. The material is then pumped through hoses to where it is required.

The unit is driven by a gear motor. The motor is designed for 140 r.p.m. at 50 Hz. The maximum torque is achieved at 224 r.p.m (set value on potentiometer approx. 80 %). Above this speed, the torque declines again.

The conveyor screw is designed in such a way that the material is subjected to additional mixing in the material trough.

The entire machine can be controlled from different points, either directly at the switch cabinet on the machine or remotely from the spraying unit, adhesive gun or remote control (optional).

A safety switch on the safety grid reduces the risk of accidents. When the grid is open, the machine cannot be switched on, or (if already on) switches off. The pump can only be re-started with the double push button when the safety grid has been closed.





**WARNING**

***Hose couplings or material could be projected forcefully when opening hose couplings.***

***Before opening the couplings:***

***- make sure that the machine is switched off and that mortar and hoses are fully depressurized,***

***- wear regulation goggles,***

***- check pressure on hose pressure gauge and cover couplings with a tarpaulin.***

***Do not face the coupling directly when opening it.***

- Clean mortar hoses (see section 6.3)

## 5.7 Intervals

**ATTENTION**

***After intervals in work, set the potentiometer to minimum value, in order to avoid overloading the motor when it is switched on.***

The speed can then be increased again.

In case of intervals in work lasting longer than 10 minutes, switch the machine off at the double push button “On/Off” and the main switch.

**ATTENTION**

***Material may set inside the machine and hoses.***

***During intervals in work, remember the time required for the mortar to set.***

***When using adhesive, intervals in work should not normally exceed 10 minutes.***

***At high temperatures, or for intervals in work of more than 30 minutes, the machine should be run until the mortar hoses are empty.***

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## 5.5 Applying Adhesives (optional)

**WARNING**

***Never point the adhesive gun at persons!***

***The machine is still ready for operation if switched to "standby" and can be started remotely and accidentally at any time causing serious injury.***

***The white lamp on the double “On/Off” button lights up in standby mode.***

- Connect adhesive gun as described in the section “Connecting the adhesive gun” (page 35)
- Set potentiometer to minimum value
- Set main switch to “1” and switch machine on at double push button “On/Off”
- Increase speed to suit material

The pump can now be switched on via the air trigger on the adhesive gun.

## 5.6 Removing Blockages

**WARNING**

***Hoses could explode or material be projected if blockages occur.***

***The machine must be switched off immediately at the double push button “On/Off”.***

- Set toggle switch “forward/back” to “back”
- Switch machine on at double push button “On/Off” and allow it to run in reverse until the mortar hoses are fully de-pressurized
- Switch machine off at double push button “On/Off” and set main switch to “0”.



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With the adhesive gun, the pump speedy P20V si can also be used for adhesives in insulation systems. For this purpose, either the spiral pump “m-tec star” (standard) or the spiral pump D4 - 1/2 can be used.

With an additional extruder, the pump speedy P20V can also be used for smaller quantities of material, e.g. silica grounding, liquid ingrain wall coating, covering plaster coatings etc.

## 2.2 Pump speedy P20V - Machine Diagram

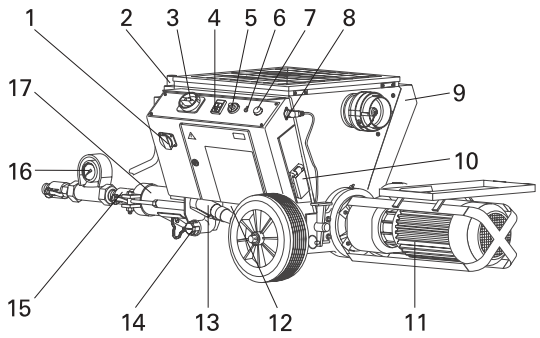


*Fig. 1: General view 1*

1 *Socket 20 A, 3-pole*
2 *Holder for wet-mortar probe*
3 *Main switch*
4 *Double push button “On/Off”*
5 *Speed controller*
6 *Toggle switch “Forward / Back”*
7 *Signal lamp “Error frequency inverter”*
8 *Connection for control cable of remote control (optional) or air-pressure monitor (optional)*
9 *Tool box*
10 *Input socket L6 - 30 A, 250 V*
11 *Pump motor*
12 *Connection frequency inverter*
13 *Connection pump motor*
14 *Socket for emptying material trough with C coupling*
15 *Pump end piece*
16 *Hose-pressure gauge*
17 *Eccentric spiral pump*

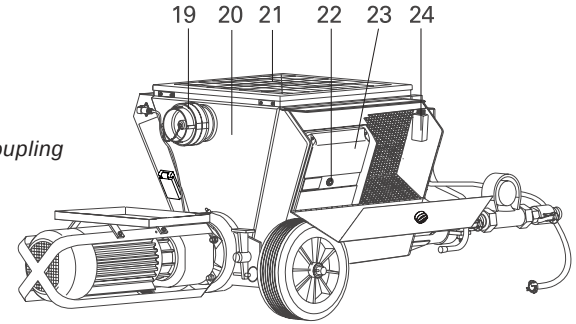


*Fig. 2: General view 2*

19 *Connection for 2" hose with C coupling*
20 *Material trough*
21 *Safety grid on material trough*
22 *Air-pressure monitor (optional)*
23 *Frequency inverter*
24 *Safety switch*





- Set switch on cable drum of remote control to “1”.
- Set potentiometer to minimum value
- Set main switch to “1” and switch machine on at double push button “On/Off”
- Increase speed to suit material

The pump can now be switched on and off via the remote control.

## 5.4 Spraying (optional)

**WARNING**

***Never point the spraying unit at persons!***

***The machine is still ready for operation if switched to "standby" and can be started remotely and accidentally at any time causing serious injury.***

***The white lamp on the double “On/Off” button lights up in standby mode.***

- Connect air fitting, compressor and spraying unit as described in the section “Connecting compressor and spraying unit” (page 34)
- Switch on the compressor
- Open the air valve on the spraying unit. Otherwise the machine cannot start when the compressor is on
- Set potentiometer to minimum value
- Set main switch to “1” and switch machine on at double push button “On/Off”
- Increase speed to suit material

The pump can now be switched on via the air valve on the spraying unit.

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## 5.2 Pumping Material

**ATTENTION**

***Wrong material thickness or wrong motor speed setting may lead to blockages or to overloading of the pump motor.***

***From a speed of 224 r.p.m. (set value on potentiometer approx. 80 %), the torque of the pump declines.***

- Set potentiometer to minimum value
- Set main switch to “1”
- Switch pump on at double push button “On/off”

Immediately after switching on, the pump runs backwards for 2 sec. to release the spiral pump if it has become stuck. The direction of rotation then changes and material is pumped to the required location.

- Increase speed to suit material

## 5.3 Pumping with Remote Control (optional)

**WARNING**

***Danger of serious injury***

***The machine is still ready for operation if switched to "standby" and can be started remotely and accidentally at any time causing serious injury.***

***The white lamp on the double “On/Off” button lights up in standby mode.***

To work with remote control

- Connect remote control as described in section “Connecting the remote control” (page 33)



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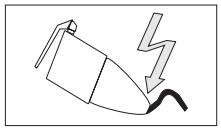
## 2.3 Symbols on the Machine

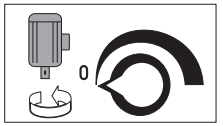
The following symbols are marked on the machine to assist the user:

Storage of operating instructions

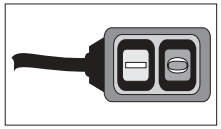
Crane lifting point



Input plug

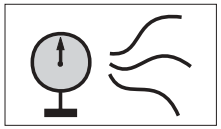



Speed controller for pump motor

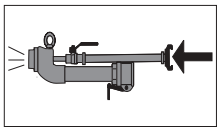


Remote-control cable connection
Remote control or
of air-pressure monitor

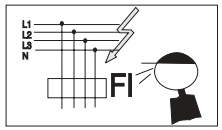
Warning lamp “error”
Frequency inverter



Air-pressure monitor



Air supply (if compressor connected)




Connection via FI circuit breaker only

## 2.4 Technical Data, Pump Unit

| | | |
|---|---|---|
| Gear motor: | voltage: | 230 V |
| | Frequency: | 60 Hz |
| | Power: | 4 kW |
| | Nominal speed: | $n_2$ = 140 r.p.m. |
| | Speed range: | $n_2$ = 5.6 – 280 r.p.m. |
| Delivery power: (with ref. to plasters and mortar, with screw housing-DP8/2) | delivery pressure: | up to 30 bar (435 psi) |
| | delivery quantity: | approx. 0.5 – 25.4 l/min (0.132 – 6.71 gal./min) |
| | delivery distance: | max. 30 m (89.43 ft) |
| | deliver height: | max. 20 m (65.62 ft) |
| Pump power: (with ref. to adhesive) | max. pumping pressure: | 30 bar (435 psi) |
| | Delivery quantity: | 10 l/min (2.64 gal./min) |
| | Delivery distance: | max. 30 m (89.43 ft) |
| | Delivery height: | max. 20 m (65.62 ft) |

Delivery quantities, distances and heights are dependent on the material being pumped and the condition of the rotors and stators in use.





## 5.1 Filling from a Continuous-Flow Mixer

**WARNING**

***Nonobservance of the instructions for the continuous-flow mixer in use could result in damage to the machine or equipment or even in death or serious injury.***

***Always comply with the instructions for the continuous-flow mixer in use.***

**ATTENTION**

***For proper material consistency, do not fill the material trough of the pump speedy P20V until the material consistency is correctly set at the continuous-flow mixer.***

Depending on the fittings of the continuous-flow mixer, it can be controlled via a wet-mortar probe which measures the level of material in the trough of the pump (see section “Installing wet-mortar probe”).

- Before filling the pump speedy P20V, the consistency of the material must be set correctly on the continuous-flow mixer
- Position the pump speedy P20V under the continuous-flow mixer in such a way that the material is fed into the front third of the material trough

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**ATTENTION**

***Never use the main switch to switch the machine on and off.***

***The frequency converter may malfunction when switching the machine off repeatedly using the main switch.***

***The machine must be switched on and off only at the double push button “On/Off”, by means of the spraying unit or the adhesive gun.***

If this happens, switch the machine off at the main switch and wait for at least one minute before switching it on again.

**ATTENTION**

***To avoid overloading the motor if the material is too thick, set the potentiometer to minimum value when starting the machine.***

***The speed can then be increased as required.***





## 2.5 Air Supply (optional)

**INFORMATION**

***Compressor and air fittings are not part of the standard supply. For order data, see section 9 Spare Parts.***

The pump speedy P20V can be connected to a compressor which supplies the compressed air required for the spraying process. The pump speedy P20V is then controlled automatically by the spraying unit via the pressure-monitoring device.

**ATTENTION**

***In order to prevent undesirable events and for energy saving reasons, the compressor should be switched off when it is not required.***

***Use either the “Off” switch on the compressor, or (if connected directly to the pump speedy P20V), the motor-protection switch in the switch cabinet.***

Air-pressure monitor: Switch-on pressure 1.4 bar (20.3 psi)
Switch-off pressure 1.8 bar (26.1 psi)

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## 2.6 Electrical Control System

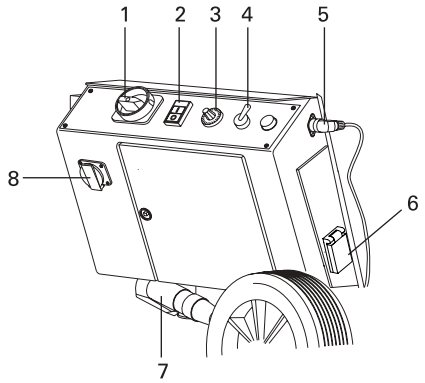


*Fig. 3: Switch cabinet*

1 *Main switch*
2 *Double push button “On/Off”*
3 *Potentiometer for motor-speed control*
4 *Toggle switch “forward / back”*
5 *Connection socket for remote-control cable or air-pressure monitor (optional)*
6 *Power input socket L6 - 30 A, 250 V*
7 *Connection socket for pump motor*
8 *Socket 20 A, 3-pole*

**Main switch (fig. 3.1)**
In position “0” the entire unit is disconnected; in position “1” the pump is ready for operation.

**Double push button “On/Off” (fig. 3, 2)**
When the main switch is at “1”, the pump can be switched on and off with the double push button “On/Off”. When the machine is switched on, the pump runs backwards for approx. 2 sec. and then automatically forward.

**Potentiometer (fig. 3, 3)**

The potentiometer is for continuous setting of the pump-motor speed.

**Toggle switch “forward/back” (fig. 3, 4)**
For normal pump operation the toggle switch is at “forward”. When the machine is switched on, the pump runs backwards for approx. 2 sec. to release the spiral pump if stuck. It then switches automatically to forward motion.

If the hose is blocked, set the toggle switch to “back”. The pump motor now runs in reverse until the pressure in the hoses is reduced.





# 5 Operation

**WARNING**
***Damage to the machine or parts of it could cause personal injury, electrocution etc.***

***Before every shift, the machine must be carefully inspected by the foreman for obvious signs of damage or defects, in particular to electric cables, plugs, couplings, mortar hoses and air hoses.***

**WARNING**
***Nonobservance of the safety regulations could result in damage to the machine or equipment or even in death or serious injury.***

***The currently valid accident-prevention regulations as well as generally accepted safe working practices must be observed at all times.***

**WARNING**
***Never point the spraying unit at another person!***

***The machine is still ready for operation if switched to "standby" and can be started remotely and accidentally at any time causing serious injury.***

***The white lamp on the “On/Off” button lights up in standby mode.***

**WARNING**
***Moving parts can crush and cut.***

***Do not put your hands into the material trough.***

***Do not place objects in the material trough.***

***When filling from a continuous-flow mixer, ensure that the safety grid is mounted securely on the material trough of the pump.***

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## 4.11 Preventing Blockages

**WARNING**

***Hoses could explode or material be projected if blockages occur.***

***To prevent blockages, the mortar hoses must be lubricated with slurry before being used.***

- Fill the material trough or the mortar hose with approx.6 l (1.6 gal.) of lime slurry
- Place a bucket under the open end of the mortar hose
- Switch toggle switch “forward/back” to “forward”
- Switch main switch to “1” and switch pump on at double push button “On/Off”
- Allow the pump to run until the lime slurry is pumped through the mortar hoses into the bucket
- Switch pump off at double push button “On/Off”

**ATTENTION**

***Do not process lime slurry.***

***For reasons of incompatibility, mixing of lime slurry with processed material may deteriorate material quality.***

**ENVIRONMENTAL HAZARD**

***Always observe environmental regulations when disposing of lime slurry.***





**Sockets on Switch Cabinet 230 V, 60 Hz 2ph (fig. 3)**

**5** Connection socket (4-pole) for control cable of remote control or air-pressure monitor of adhesive gun.

**6** Input: L6 - 30 A, 250 V

**7** Pump: 10-pole

**8** Socket 20 A, 3-pole

## 2.7 Accessories Supplied

The pump speedy P20V is fitted with the following accessories by the manufacturer:

- Eccentric spiral pump
- Pump end piece, pump speedy P20V, 35.
- Reducing adapter V35/V25
- Hose-pressure gauge V35/M35

## 2.8 General Data of the Pump speedy P20V

| | | |
|---|---|---|
| **Dimensions** | Length: | 1400 mm (55.118") |
| | Width: | 650 mm (25.59") |
| | Height: | 540 mm (21.26") |
| **Weight** | with accessories approx.: | 95.0 kg (209.5 lbs) |
| | Accessories: | 5.0 kg (11 lbs) |
| | Compressor (optional): | 22.0 kg (48.4 lbs) |
| | Gear motor: | 35.0 kg (77 lbs) |
| | Conveyor screw: | 2.5 kg (5.5 lbs) |
| | Pump end piece complete: | 4.0 kg (8.8 lbs) |
| **Noise level** | With continuous-flow mixer: | 66 dB(A)* |
| | Without continuous-flow mixer: | 61 dB(A)* |

(* Noise-pressure level at 1 m (3.28 ft) distance, free-field measurement during operation)

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# 3 Transport and Positioning

## 3.1 Transporting the Machine

**WARNING**

***To avoid personal injury or damage to the machine when lifting the machine above ground level or onto a truck by a crane or other lifting gear, the following points must be observed:***

- ***Any material remaining in the mortar trough and machine must be removed before transporting the machine.***
- ***Hoisting equipment (e.g. rope, belt) with a minimum load-bearing capacity of 400 kg (880 lbs) must be used.***
- ***The belts must be fastened in such a way that they cannot slip.***

If the machine is being moved by hand, use the handles on the frame (fig. 4, 1)





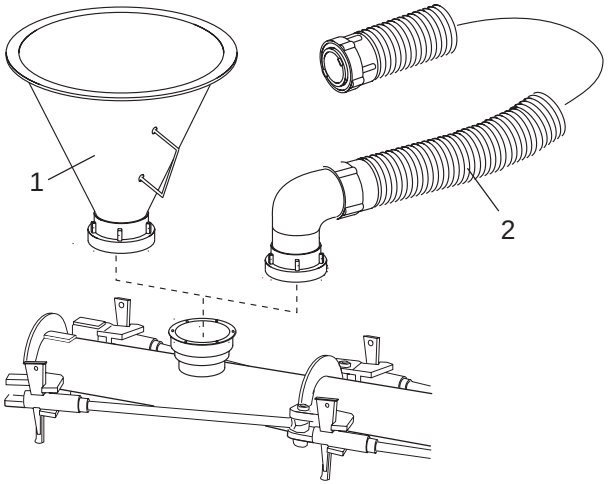


*Fig. 10: Extruder with filling funnel or 2" hose with C couplings.*

*1 Filling funnel*
*2 2" hose with C couplings*

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## 4.10 Installing an Extruder (optional)

With an optional extruder, smaller quantities of material, (e.g. silica grounding, liquid ingrain wall coating, covering plaster coatings) can also be pumped.

**ATTENTION**

***To avoide corrosion and for ease of movement, the flange surfaces on the material trough, extruder and spiral pump must be clean.***

- Remove the spiral pump from the material trough (reverse sequence to that described in section 4.2 “Installing the spiral pump”)
- Install the extruder on the material trough using the same procedure as described in section 4.2 for the spiral pump
- Instead of installing the spiral pump on the material trough, install it on the extruder using the same procedure as described in “Installing the spiral pump”, in section 4.2

Now the pump can either be filled

- using a funnel (see fig. 10, 1) directly from a bucket or,
- via a 2" hose with C couplings (fig. 10, 2) from a container





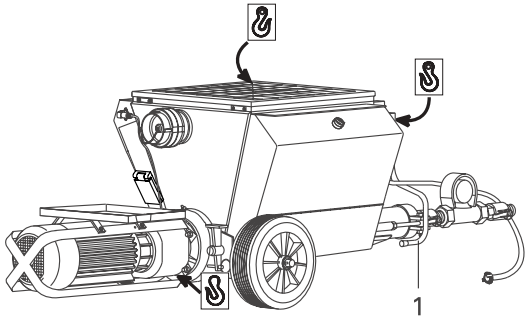


*Fig. 4: Transport*

*1 Handles*

*Load-attachment points*

## 3.2 Positioning the Machine

**WARNING**

***Tilting or moving of the machine could cause malfunction or damage to the machine or personal injury***

***The machine must be positioned fimly on a level surface and must be secured.***

***The machine must be positioned in an area where no objects can fall onto 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.***

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# 4 Start-up

**WARNING**

***Nonobservance of the special safety regulations applicable to mortar-spraying machines could result in damage to the machine or equipment or even in death or serious injury.***

***When working with the machine, always observe the special safety regulations applicable to mortar-spraying machines.***

**WARNING**

***Damage to the machine or parts of it could cause personal injury, electrocution etc.***

***Before every shift, the machine must be carefully inspected by the foreman for obvious signs of damage or defects, in particular to electric cables, plugs, couplings, mortar hoses and air hoses.***

***Any damage must be repaired before starting the machine.***

**WARNING**

***Danger of electrocution as certain components remain live even when the machine is switched off.***

***Before carrying out installation work, switch the machine off and pull out the plug.***





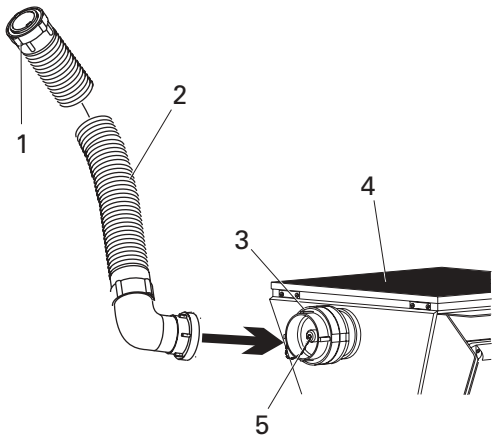


*Fig. 9: Conversion for container filling*

*1 C coupling for connection to container*
*2 2" hose with C couplings*
*3 Connection point for C coupling on material trough*
*4 Closing cover*
*5 C blind cover, secured with chain*

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## 4.9 Conversion for Container Filling (optional)

With the pump speedy P20V it is also possible to pump pasty material from a container. This operation requires the following accessories:

- Closing cover
- 2" hose with C couplings

**WARNING**

***Danger of electrocution or unintentionally switching on the machine.***

***Before working on electrical components or converting the machine, switch the double push button “On/Off” to “Off” and the main switch to “0”.***

***Then pull out the power plug.***

- Remove the safety grid from the material trough
- Mount the closing cover in place of the safety grid and tighten it with the clamping locks

**ATTENTION**

***For ease of movement of the hose couplings, ensure that the sealing edges of the pump and the closing cover are clean.***

- Remove C-blind cover (fig. 9, 5) to ensure that the passage to the material trough is open
- Mount 2" hose with C couplings between the transfer hood and the container
- Re-connect power cable





**WARNING**

***Moving parts can crush and cut.***

***Do not put your hands into the material trough.***

***Before starting the machine up, ensure that the safety grid is installed on the Pump speedy P20V.***

## 4.1 Installing the Conveyor Screw

- Remove safety grid
- Insert conveyor screw into motor coupling
- Replace safety grid and secure with bolt, washer and spring washer

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## 4.2 Installing the Spiral Pump

The spiral pump consists of a stator with a rotor to match.

**ATTENTION**

***For proper functioning of the machine, the flange surfaces on the material trough and the spiral pump must be clean.***

***Follow the installation instructions on the stator closely.***

- Push the spiral pump (fig. 5, 2) onto the flange in the material trough
- Hook a connecting rod (fig. 5, 3) into one side of the material trough
- Hook the second connecting rod onto the pump mixing pipe
- Secure the spiral pump with the help of the clamping wedges (fig. 5, 1)

If the spiral pump is not secure enough:

- Release the counter nuts (fig. 5, 4) of the connecting rods
- Tighten the clamping nuts (fig. 5, 5 both sides) and secure them with the counter nuts

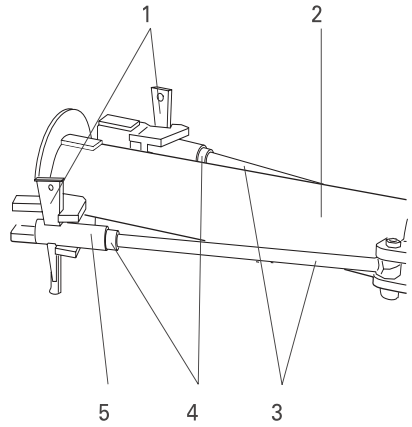


*Fig. 5: Installing the spiral pump*

*1 Clamping wedges*
*2 Spiral pump (rotor and stator)*
*3 Connecting rods*
*4 Counter nuts*
*5 Clamping nuts*





## 4.7 Connecting the Adhesive Gun (optional)

For applying adhesive, either the spiral pump “m-tec star” (standard) or the spiral pump D 4 - 1/2 (accessory) can be used.

- If necessary, install the spiral pump 4 - 1/2 (optional) for adhesive (see section 4.2 “Installing the spiral pump”)
- Couple the adhesive gun to the mortar hose (fig. 8, ❷)
- Couple the control cable of the adhesive gun to the 4-pole flange socket (fig. 8, ❶)

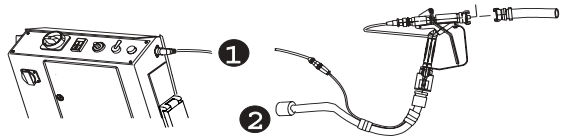


*Fig. 8: Connections for adhesive version*

*1 Adhesive gun control cable*
*2 Adhesive gun connection to mortar hose*

## 4.8 Connecting Wet-Mortar Probe

If the pump is being filled by means of a continuous-flow mixer (see section 5.1 “Filling from a continuous-flow mixer”) the continuous-flow mixer can be controlled by a wet-mortar probe.

- Insert the wet-mortar probe into the holder in the material trough of the pump
- Connect the control cable of the wet-mortar probe to the switch cabinet of the continuous-flow mixer

## 4.6 Connecting Compressor and Spraying Unit (optional)

- Connect the control cable of the air-pressure monitor to the 4-pole flange socket (fig. 7, ❶)
- Connect the compressor power cable to the switch cabinet (fig. 7, ❸)
- Connect the air hose of the compressor to the GEKA coupling of the machine (fig. 7, ❷)
- Couple the spraying unit securely to the mortar hose and air hose (fig. 7, ❹)

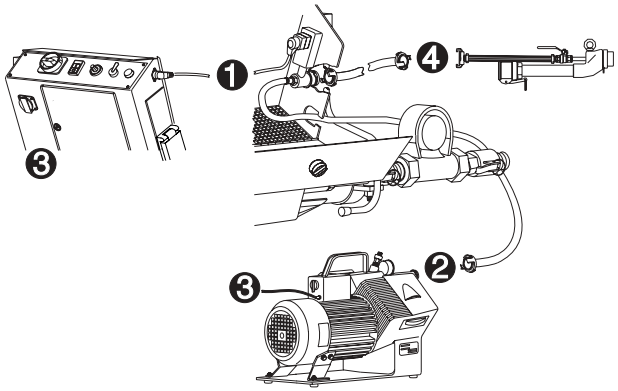


*Fig. 7: Connection of compressor to spraying unit*

*1 Air-pressure monitor control cable*
*2 Air hose connection to compressor*
*3 Power cable connection to switch cabinet*
*4 Air hose connection of spraying unit*





## 4.3 Installing the Mortar Hoses

**DANGER**

***Hoses will explode when exceeding hose pressure.***

***During operation, the pressure of 40 bars (580 psi) must not be exceeded.***

***Only mortar hoses with a permitted operating overpressure of 40 bars (580 psi) and a bursting pressure of at least 120 bars (1740 psi) must be used.***

***Lay mortar hoses in such a way that they cannot form kinks or be damaged in any way.***

***With mortar hoses ND 25, the reducing adapter V35/V25 must be inserted.***

**NOTE**

***We recommend using a hose pressure gauge as an additional safety precaution for operating personnel.***

**ATTENTION**

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

***Excessive wear to the eccentric spiral pump can be avoided by monitoring the operating pressure on the hose-pressure gauge.***

- Couple the mortar hoses firmly together

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## 4.4 Connecting the Power Supply

**WARNING**

***Nonobservance of regulations for power supply, cable connection and fuse protection could cause personal injury, electrocution and damage to the machine.***

***The machine must be connected to a regulation site distributor box with FI automatic circuit breaker.***

***Use only FI safety switches with the symbol shown opposite.***

**ATTENTION**

***The frequency inverter may cause the FI circuit breaker to malfunction.***

***Before starting the pump speedy P20V, the function of the FI circuit breaker must be tested while the machine is running.***

***To test the circuit breaker, press its test-button. If the FI circuit breaker does not trigger, switch the machine off immediately, pull out the mains plug, and have the circuit breaker repaired by a qualified electrician.***

The pump speedy P20V is operated with an input voltage of 230 V, 60 Hz 2ph (see fig. 6, 1):

Use a connection cable SJ0W-14/4 with the earth conductor connected. Fuse 35 A. Compressor socket and safety socket are ready for operation.





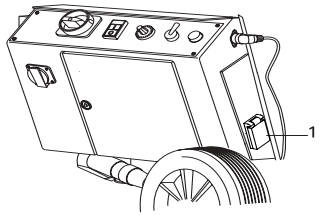


*Fig. 6: power-supply connection 230 V, 60 Hz 2ph*

*1 Power input socket L6 - 30 A, 250 V.*

## 4.5 Connecting the Remote Control (optional)

- Connect the control cable of the remote control to the 4-pole flange socket (fig. 7/8, ❶)

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