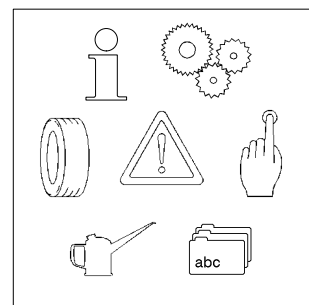


Operating Instructions

for machine operator and maintenance staff

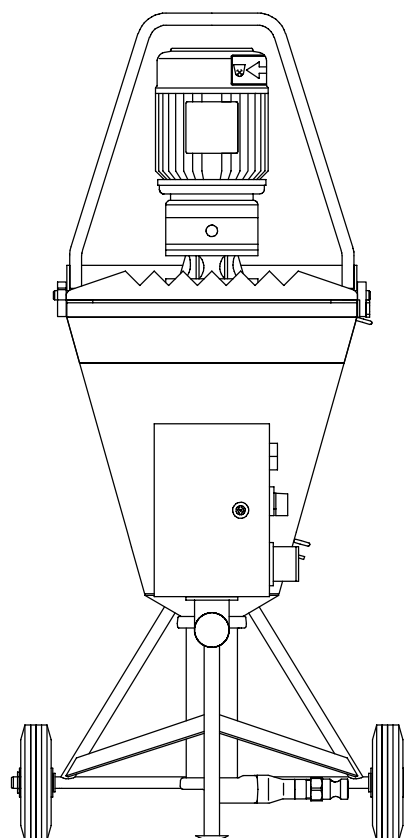
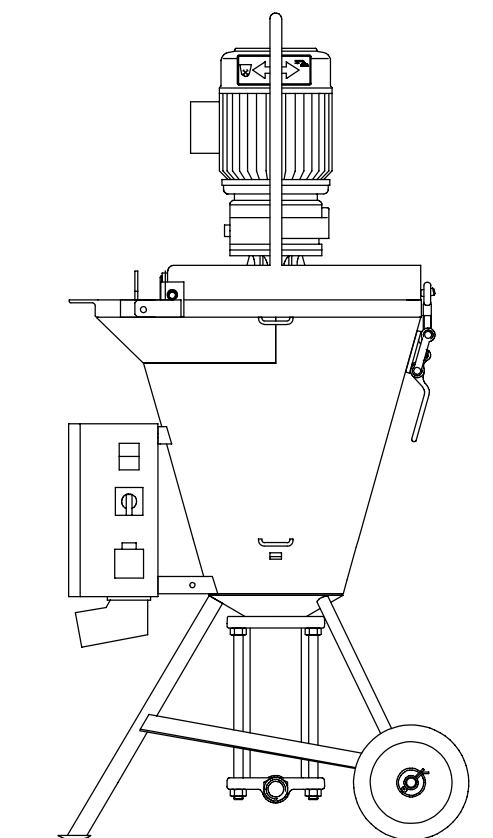
always keep by the machine



Auger pump

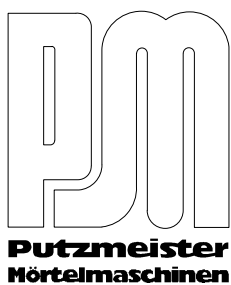
P12 Sprayboy

Machine no.



0012

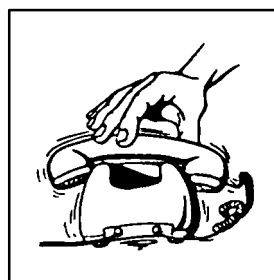
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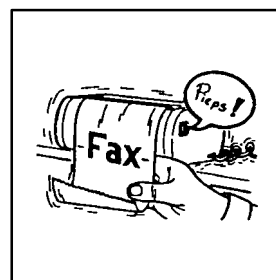
Putzmeister
Mörtelmaschinen GmbH
Max-Eyth-Str . 10
D-72631 Aichtal



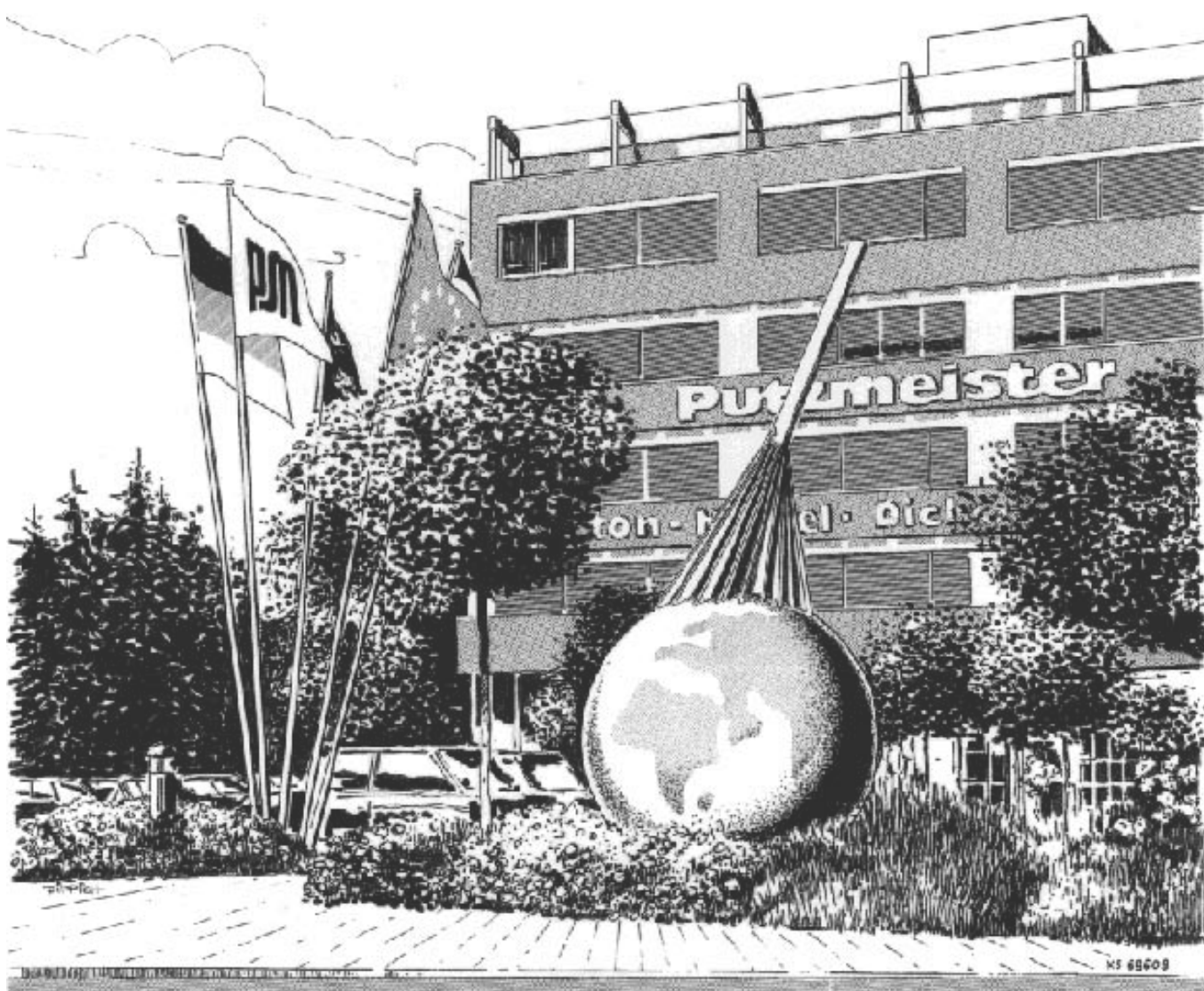
P.O. Box 2152
D-72629 Aichtal

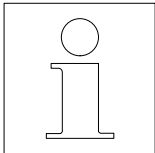
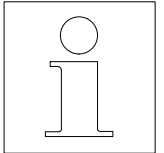


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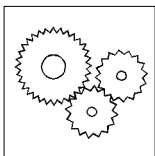
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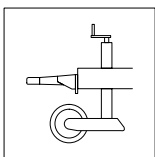
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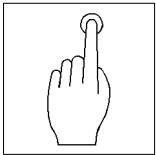
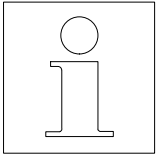
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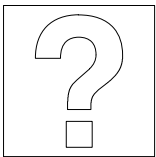
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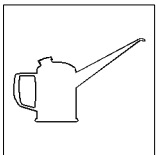
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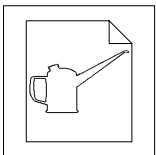
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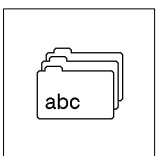
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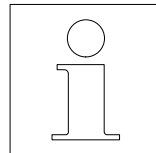


Maintenance Chart

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Index of Key Words



1 About these Operating Instructions

In this chapter you will find notes and information that will help you use these Operating Instructions. Do not hesitate to contact us if you have any queries:

Putzmeister Mörtelmaschinen GmbH
Postfach 2152
D-72629 Aichtal
Telephone +49 (0)7127 599-0
Fax +49 (0)7127 599-743
Internet: <http://www.putzmeister.de>
E-mail: pmm@pmw.de

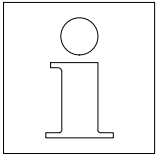
or the Branch or Works Agency that looks after you.

Address: _____

Telephone: _____

Fax: _____

E-mail: _____



1.1 Foreword

These Operating Instructions are intended to familiarize the user with the machine and to assist him in using the machine properly in various possible applications.

The Operating Instructions contain important information on how to operate the machine safely, properly and economically. Observing these instructions helps to avoid danger, to reduce repair costs and downtimes, and to increase the reliability and service life of the machine.

The Operating Instructions must be supplemented by the relevant national rules and regulations for accident prevention and environmental protection.

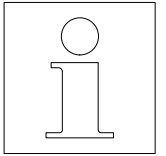
The Operating Instructions must always be available wherever the machine is in use.

The operator must inform every person who is in charge of work with or on the machine where the operating instructions may be found and make these accessible to them. These Operating Instructions must be read and applied by any person in charge of carrying out work with and on the machine e.g.

- in operation, including setting up, fault rectification in the course of work, removal of production waste, care and disposal of fuels and consumables;
- in service (maintenance, inspection, repair), and/or
- Transport.

The generally-recognized rules of technology for safe and proper working must be observed in addition to the Operating Instructions and mandatory rules and regulations for accident prevention and environmental protection in the country and place of use of the machine.

The Branch or Agent serving you, or the Aichtal Works, will be happy to give you more information, should you have any questions following your study of the Operating Instructions.

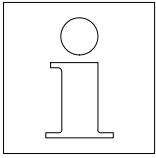


You will make it much easier for us to answer any questions if you can give us the details of the machine model and the machine number.

Modifications are made from time to time in the interests of constant improvement and it could be possible that we were unable to take these into consideration when these Operating Instructions were printed.

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About these Operating Instructions



1.2 Icons and symbols

The following icons and symbols are used in the Operating Instructions:

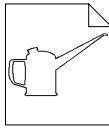


Action symbol

Text following this symbol describes tasks which you are required to work through, generally in the sequence shown from top to bottom.



Text after this icon describes the result or the effect of an activity.



Refer also to the maintenance charts:

This symbol is used to refer to the maintenance charts required, possibly as a supplement to the maintenance charts you are currently reading.



The following special tool is required:

This icon identifies the special tools necessary to carry out the work. Normal tools, i.e. commercially-available tools or tools carried in the vehicle, are not listed separately.



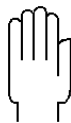
Environmental protection

This symbol is used to identify tasks during which particular attention is to be paid to environmental protection. The associated text is written in italics and is closed off with a line.



Note

Particular specifications with regard to the economic use of the machine are introduced with the word "Note" and the pictogram illustrated. The associated text is written in italics and is closed off with a line.



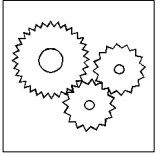
Caution

Particular specifications or instructions and prohibitions with regard to the prevention of damage are introduced with the word "Caution" in bold and the pictogram illustrated. The associated text is written in italics and is closed off with a line.



Danger

Particular specifications or instructions and prohibitions with regard to the prevention of personal injury or significant damage are introduced with the pictogram illustrated, the word "Danger" written in bold and a line. The associated text is written in italics and is closed off with a line.

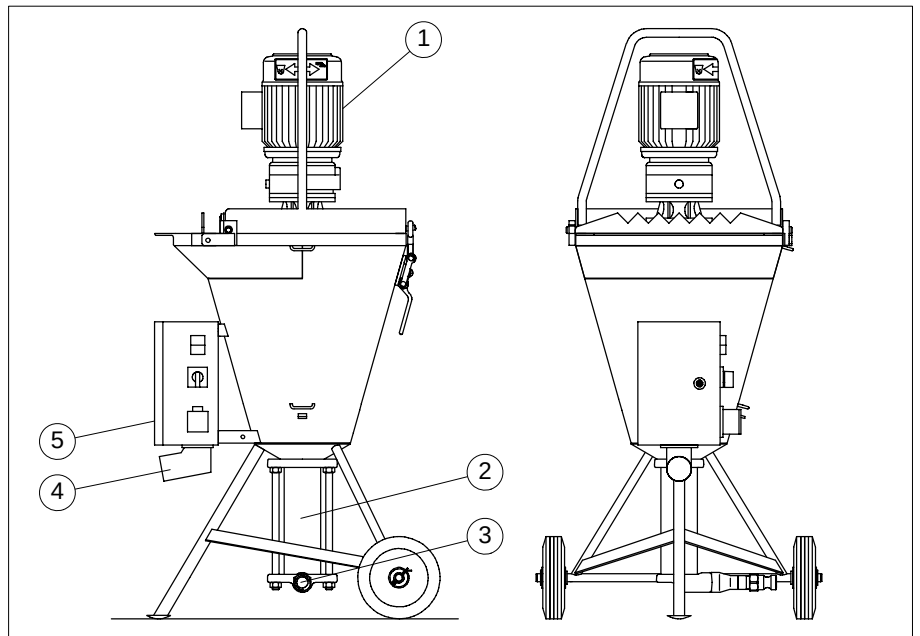


2 General Technical Description

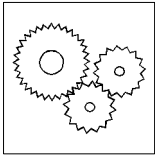
This chapter describes the components and assemblies on this machine and describes how they function. Please note that possible options are also described. Please see the machine card to find out whether a particular option is fitted.

2.1 Overview

Below you will find an overview of the most important components; these will then be described on the following pages.



- 1 Drive motor
- 2 Auger pump
- 3 Pressure connection
- 4 External device plug
- 5 Control cabinet



2.2 Technical data

The technical data and features listed below relate to the P12.

Dimensions

	P12	P12/230V
Length:	714 mm	
Height:	1437 mm	
Width:	696 mm	
Fill height:	936 mm	
Drum capacity:	50 l	

Weights

	P12	P12/230V
Weight:	125 kg	128 kg

Power output

	P12	P12/230V
Engine:	1.4/1.8 kW 94/188 rpm	1.7 kW 96 rpm

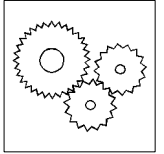
Power supply

	P12	P12/230V
	3-pole, 400 V, 10 A	1-pole, 230 V, 16 A
Connection to power unit:	5 kVA	



Note

The values are listed in the supplied circuit diagram.



Delivery rate

	P12	P12/230V
Max. delivery output:	12 l/h	8 l/h
Maximum delivery distance:	26 m wide	20 m wide
	15 m high	10 m high
Max. grain size:	3 mm	

Different flow rates can be achieved by replacing pump components:

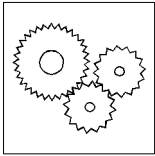
	380 V	230 V
Pump D 4	Stage I - 4 l/min Stage II - 8 l/min	6 l/min
Pump D 4 1/2	Stage I - 2 l/min Stage II - 4 l/min	3 l/min
Pump D 4 1/4	Stage I - 1 l/min Stage II - 2 l/min	1.5 l/min
Pump D 5 short	Stage I - 6 l/min Stage II - 12 l/min	8 l/min



Note

The stated flow rates are guide values only.

The actual rates depend on the properties and consistency of the material to be delivered.

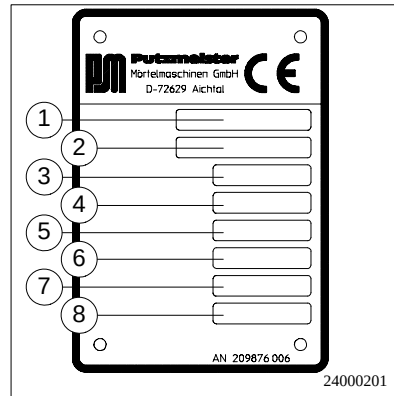


General Technical Description



The most important data are shown in brief on the rating plate mounted on the machine.

Rating plate

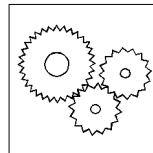


- 1 Model (machine model)
- 2 Machine no. (machine number)
- 3 Year of manufacture
- 4 Maximum delivery pressure [bar]
- 5 Hydr. pressure max. [bar] (maximum fluid pressure in the hydraulic system)
- 6 Voltage [V]
- 7 Frequency [Hz]
- 8 Power [kW]

Noise emission measurement

Noise emission measurement for mortar machines gave a measurement of $\leq 85 \text{ dB}_A$.

Measurement was carried out in accordance with
Machine Noise Information Regulation
— 3rd regulation relating to the German Equipment Safety Law —



2.3 Description of the functions

This chapter is intended to help you understand the functions of the machine so that you can limit the field of the machine's applications to suitable areas and avoid errors in operation.

General description of the machine

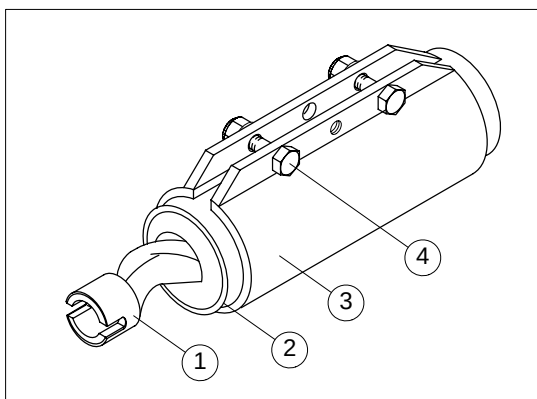
Putzmeister machines are easy to assemble and operate. In spite of this, certain precautionary measures must be taken when operating the machine to ensure that the wear parts have as high a life limit as possible.

Drive motor

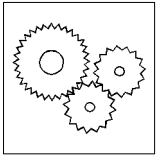
The P12 is driven by an electric motor. For maintenance and operation of the drive motor, observe also the supplied manufacturer's documentation.

Auger pump

The auger pump built into the machine is called a displacement pump. An auger (rotor) rotates inside a fixed auger barrel (stator). The auger consists of a highly wear-resistant, very hard metal alloy and the auger barrel of a multi-notched steel sleeve with vulcanized elastic rubber core. The clamping sheath is used to reclamp the auger pump.



- 1 Auger
- 2 Auger barrel
- 3 Clamping sheath
- 4 Tensioning screws



2.4 Control devices

This section gives you a summary of the various control devices on the machine and the symbols used for control actions.

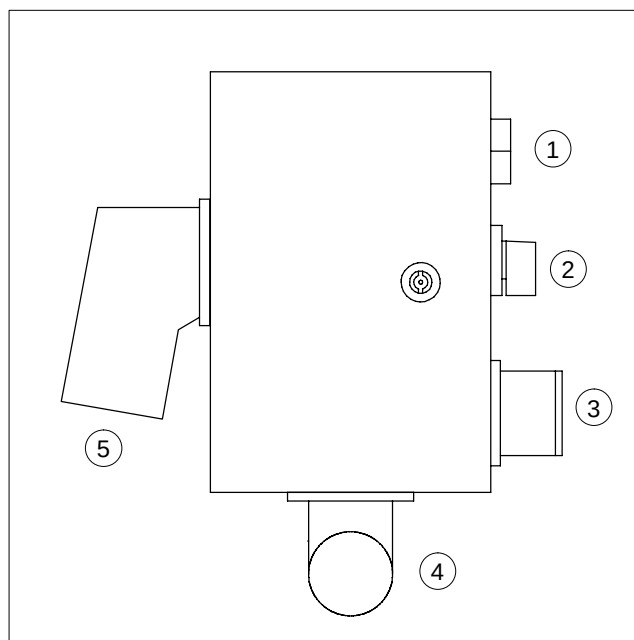
The functions of the machine are assigned to the following control devices:

- Control cabinet
- Auger pump
- Remote control

Control cabinet

The machine is controlled and operated via a control cabinet. The control and operating instruments are located here.

The control cabinet's wiring, earthing and connections comply with VDE codes of practice.



Item	Designation	Function/display
1	Double pushbutton	Drive motor ON-OFF
2	Selector switch	Mixing-OFF-Pump
3	External device socket	Remote control connection
4	External device socket	Drive motor connection
5	CEE external device plug	Power supply connection



3 Safety Regulations

This chapter summarizes the most important safety regulations. This chapter is, therefore, particularly suitable for an initial basic instruction of new operators. Naturally, the various regulations are also repeated once more at the appropriate points in the Operating Instructions.



Note

Special safety regulations may be necessary for some tasks. These special safety regulations will only be found in the description of the particular task.

We include here a listing of regulations and safety standards for your information:

- *pr EN 12001, Delivery, spraying and distributing machines for concrete and mortar,*
- *EN 292, Safety of machinery,*
- *pr EN 12151,*
- *EN 60204-1, Electrical equipment of machines,*
- *EN 50081-1,*
- *EN 50082-1,*
- *EMC directives, 89/336/EEC,*
- *Low voltage directives, 73/ 23/EEC,*
- *Safety regulations for mortar delivery and spraying machines issued by the German Industrial Employers' Liability Insurance Association ZH 1/575.*



3.1 Principle

Use only machines in a technically perfect condition, as designated and being conscious of safety and the dangers, taking account of the Operating Instructions. Any faults, especially those affecting the safety of the machine, must, therefore, be rectified immediately.

Take care to ensure that:

- no safety equipment is removed, rendered inoperable or modified (grille on the pump filling hopper etc.),
- safety equipment removed for the purposes of maintenance work is refitted immediately the work is completed.

Check operational safety every time you start work. Any defects found or suspected must be repaired immediately. If necessary, inform the project supervisor. Cease work if defects that may jeopardize operational safety are found.

Use only perfect delivery lines, hoses, couplings etc. suitable for the delivery job and manufactured by the machine manufacturer. Delivery lines are subject to wear which varies according to the pressure and composition of the medium, the material from which the delivery line is made, etc.

Onwards sale

The following should be noted if you sell the machine on:

Pass on to the new operator all the accompanying documentation (Operating Instructions, Maintenance Instructions, diagrams, machine cards, inspection certificates etc.) you received with your machine. If necessary, you may have to order the papers from us, giving the machine number. The machine may not be sold on without the accompanying documentation under any circumstances.

Reporting an onwards sale or acquisition to Putzmeister ensures that you will be sent any information relating to modifications or innovations relevant to safety, and you will also be eligible for technical consultancy from our works.

Instruct the new operator and his operating personnel in the operation of the machine, just as you were instructed by us, and have them confirm that they have received instruction from you. Should you so require, we will be happy to carry out the instruction of the new operator and the new operating personnel on your behalf.



3.2 Designated use

The machine has been built in accordance with the state of the art and recognized safety rules. Nevertheless, its use may constitute a risk to life and limb of the operator or of third parties, or cause damage to the machine and to other property.

You must also observe the specified Operating Instructions and comply with the conditions and intervals for maintenance and inspection to operate the machine within the limits of its designated use.

3.3 Use contrary to the designated use

Use of the machine other than that described above, or which goes beyond such use, is considered contrary to the designated use. Putzmeister Mörtelmaschinen GmbH accepts no liability for damage resulting from such use. The risk of such misuse lies entirely with the machine operator.

The machine is not explosion proof and must not be used in potentially explosive areas.

Exclusion of liability

We state here expressly that Putzmeister Mörtelmaschinen GmbH accepts no liability for damage arising from incorrect or negligent operation, servicing or maintenance or as a result of use contrary to the designated use. This statement is equally valid for modifications to, additions to and customisation of the machine which may compromise safety. The guarantee will no longer be valid in such cases.

Modifications

Never make any modifications, additions or conversions to the machine which might affect safety without first obtaining the manufacturer's approval. This also applies to the installation and adjustment of safety devices and valves as well as to welding work on loadbearing elements.

In particular, this requirement relates to:

- adjustment of safety and control pressures, speeds of movement, power outputs, speeds of rotation and other settings to values other than those set in the works.

Safety equipment must only be repaired, adjusted or replaced by technically qualified experts.

All devices of relevance for safety must be in place and fully functional.



3.4 Sources of danger

Never reach into the moving parts of the machine, whether the machine is running or switched off. Always switch off the main switch first. Take note of the warning plate.

In the event of malfunctions, stop the machine immediately and secure it. Have any faults rectified immediately.

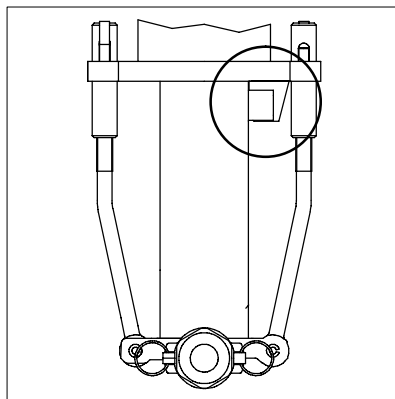
Make sure that nobody is placed at risk by the running machine before starting up the machine.

Sources of danger, Auger pump

When installing the auger pump there is a risk of injury through crushing.

Depending on the mounting position of the clamping sheath, it can turn when the machine is switched on.

Never reach into the auger pump when switching on the machine.



Risk of crushing in the end stop area of the auger pump

Safety equipment

Never remove safety equipment or render it inoperable by modifying the machine.

Safety equipment must only be repaired, adjusted or replaced by technically qualified experts.

All equipment required for safety and accident prevention (warning signs and information notices, grilles, guards, etc.) must be in place. Such equipment must not be removed, modified or damaged.

Any safety devices removed for set-up, maintenance or repair purposes must be refitted and checked immediately upon completion of the maintenance and repair work.

The machine must be operated only with the protective guard fixed to the hopper. Never switch the machine on - not even for maintenance or cleaning purposes - if the protective guard is not closed.



3.5 Selecting qualified personnel

The machine may only be operated, maintained or serviced independently by persons (machine operators) who

- have reached the legally allowed minimum age;
- are physically capable (rested and not under the influence of alcohol, drugs or medication);
- have been instructed in the operation and maintenance of the machine;
- can be expected reliably to execute the tasks they are charged with.

The machine must only be operated, serviced or maintained by persons who are trained to carry out such tasks and have been commissioned to do so.

Do not allow persons who have not yet completed training or instruction, or persons taking a general training course, to operate the machine unless under the constant supervision of an experienced person.

Couplings must be fitted to hoses by persons who possess the necessary experience and equipment required for this task.

Qualified electrician

Work on the electrical system and equipment of the machine must be carried out by a qualified electrician or by instructed persons under the supervision and guidance of a qualified electrician and in accordance with electrical engineering rules and regulations.

3.6 Place of work

The workplace is the area in which people must remain in order to carry out the work.

Machine operator

The place of work of the operator during use of the machine is at the operating panel of the machine.



3.7 Procedure in an emergency situation



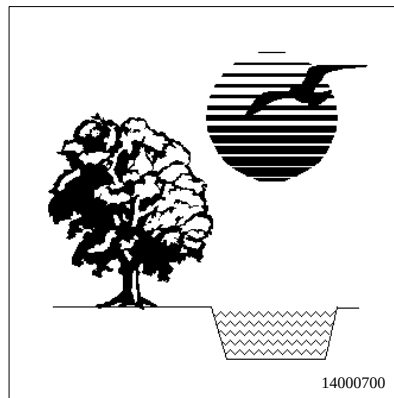
Switch off the machine at the main switch in an emergency situation.

Caution

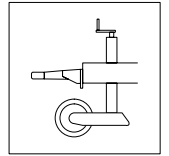
In the event of malfunctions, stop the machine immediately and secure it. Have any faults rectified immediately.

3.8 Environmental protection

Have old materials such as oils, filters, batteries, replaced parts etc. disposed of in line with regulations. Used cleaning rags should also be disposed of properly.



Environmental protection



4 Transport, Set-up and Connection

In this chapter you will find information concerning safe transport of the machine. In addition this chapter describes operations that remain to be carried out to assemble and connect the machine. Starting up the machine will not be described until the "Machine Operation" chapter.

4.1 Unpacking the machine

Before shipment, the machine is packaged for transportation. Unpack the machine and dispose of the packaging material.

Disposing of packaging material



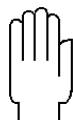
Environmental protection

Dispose of the packaging material according to the applicable environment protection regulations.

Please separate cardboard, plastic and wood and dispose of accordingly.

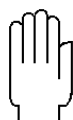
4.2 Transport

You must load your machine onto a suitable transport vehicle to transport it to the construction site.



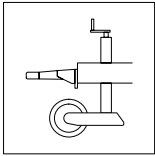
Caution

The machine may only be loaded by crane if it is equipped with suitable lifting eyes. Lifting equipment, lifting tackle, support trestles and other auxiliary equipment must be reliable and safe in operation. Make sure that the load-bearing capacity is adequate.



Caution

The machine must be properly secured on the transport vehicle to prevent it rolling away, slipping or tipping over.



Danger

Hoisted loads may fall if they are not loaded properly or if the auxiliary loading equipment is damaged.

You should, therefore, never walk under suspended loads.

4.3 Set-up site

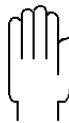
The responsibility for setting up the machine safely falls on the operator.

Inspect the proposed site carefully and reject the setup site if you have any doubts in respect of safety.

Requirements on the set-up site

The setup site must:

- be large enough to provide sufficient clearance all round the machine;
- ensure the accessibility of the machine from all sides for the purposes of servicing and repair.
- have a level, firm supporting ground.



Caution

The machine must be situated outside the danger zone of elevated worksites, or protective roofing must be provided for the machine at its operating sites.

Operations site

The machine should be located so that:

- there is no need for any sharp hose bends;
- no hoses lie on top of one another
-> risk of chafing!
- the lines are kept as short as possible.



Note

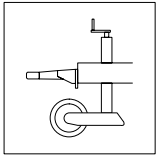
The maximum delivery distance of the P12 with a 400V connection is 26 m, the maximum delivery height is 15 m.

The maximum delivery distance of the P12 with a 230V connection is 20 m, the maximum delivery height is 10 m.

Output depends on the flow characteristics of the material and the length and routing of the delivery line.

Setting up

The machine must be installed horizontally and secured against moving.

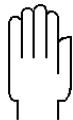


4.4 Connection

The following section describes how to connect the machine to the electricity supply.

Power supply

The electrical connection must be made on the basis of the electrical circuit diagram supplied.



Caution

Do not turn the main switch on at this stage.

The main switch must remain locked until the entire system has been completely assembled.



Note

Work on the electrical system must be carried out by qualified and licensed electricians (with proof of qualifications in compliance with the regulation EN 60204, part 1, page 14, subclause 2.21).



Danger

There is a danger of electric shock which may have lethal consequences by:

- *contact with electrical cables;*
- *contact with machines with electrical drives, if the electrical connection has not been properly made or the supply cable is damaged.*

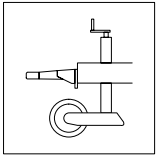


Note

When working on the machine, please take note of the relevant VDE codes of practice, German Accident Prevention Regulations (UVV) and of relevant national regulations when operating the system outside the Federal Republic of Germany.

Connecting to the mains power supply (switch cabinet 230V)

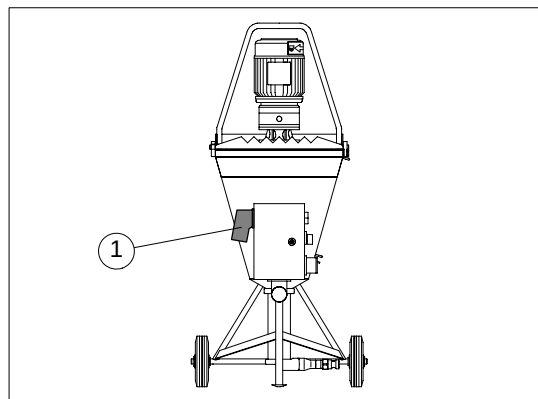
Connect luminous flux version to a separately fused circuit. Fuse rating 16 A, supply cable 3 x 1.5 mm. This connection must be made through a special feed point (generally a site distribution board with residual current circuit breaker) to VDE 0100. If cable reels are used, the cable must be unwound to its full length to prevent induction.



Connecting to the mains power supply (switch cabinet 400V)

Three-phase devices must be connected on site only through a special-purpose feed point (generally a site distribution board with residual current circuit breaker) to VDE 0100. The site cable must be of a HO 7 RNF type of size 5 x 2.5 mm; fuse rating 10 A.

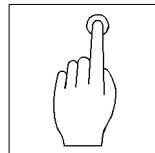
- ▶ Inspect the incoming supply cable from the site distribution board for mechanical damage.
- ▶ Establish a connection from a site distribution board to the machine.



1 Power connector

Installing electrical supply cables

The supply cables must be laid visibly, taking local conditions into consideration, and secured against damage e.g. by the use of cable channels. They must not be allowed to obstruct operating personnel.



5 Operation

In this chapter you will find information on the operation of the machine. You will learn what operations are required for setting up the machine, in operation and for cleaning.

5.1 Shutting down in an emergency situation

Make sure you are completely familiar with the procedures for shutting down the machine in an emergency situation before you start operating the machine.



Danger

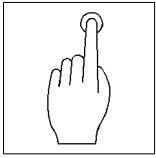
Proceed immediately as described below if an emergency occurs while you are operating the machine.

- ▶ Switch the double pushbutton (drive motor ON-OFF) at the control cabinet to "0".
- ▶ Set the selector switch (MIX-OFF-PUMP) to "0".
- ▶ Take emergency measures, where necessary.
- ▶ Look for the cause of the fault and rectify it completely.

5.2 Starting up

The machine operator must, when accepting the machine, familiarise himself with the equipment in such a way that damage and accidents cannot occur.

Every time machine operators use the machine, they accept full responsibility for the safety of anyone located in the machine's danger zone. You are therefore obliged to ensure the absolute operational safety of the equipment.



Test run

Carry out a test run and function checks before commencing work on the construction site.



Note

Any defects found during these tests must be rectified immediately. A fresh inspection is necessary after every repair. The machine may only be put into operation once all the inspections described below have been concluded satisfactorily.

Function checks

Check whether

- all bearings and lubrication points are lubricated as described in the Lubrication diagram section of the Maintenance chapter.

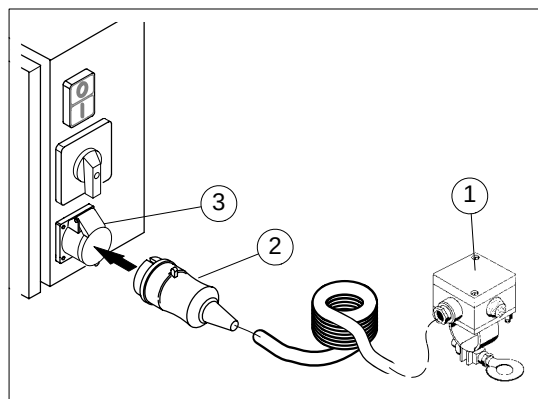
Preparing to start up

Carry out the following important check and test operations before starting up the machine.

- ▶ Always inspect the machine thoroughly for apparent defects before starting work.
- ▶ Ensure that the safety grille of the hopper is securely locked and bolted in place.

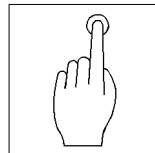
Working with remote control

When working with the remote control, you must attach the remote control coupling connector to the control cabinet.



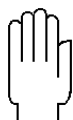
- 1 Remote control
- 2 Coupling connector "remote control"
- 3 Remote control socket on the control cabinet

- ▶ Plug the remote control (1) coupling plug (2) into the remote control socket (3).



5.3 Pumping operations

Carefully carry out the operations for starting up the machine and setting up the machine and ensure that it is functioning perfectly before you fill the hopper with medium and begin pumping it through the delivery line.



Caution

Make sure you are completely familiar with the procedure for shutting down the machine in the event of an emergency before you begin operations.



Note

Should a malfunction occur when the pump is in operation, consult the "Quick Fault Assistance" chapter in these operating instructions first.

If you cannot rectify the fault yourself, contact a Putzmeister after sales service engineer, or an authorised Putzmeister dealer.

Pump priming

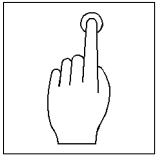
The process from the start of mortar pumping to the time at which a continuous flow of mortar exits from the spray gun is known as priming the pump.

Laitance

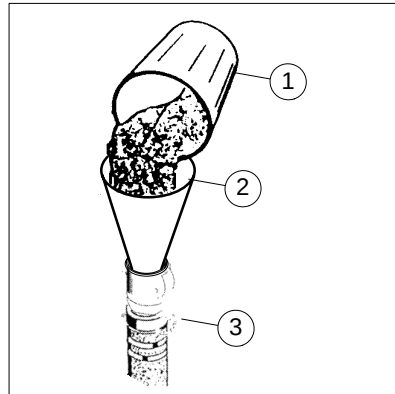
Pumping must generally be started with the aid of laitance. The consistency of the laitance depends on the material to be processed.

Depending on the material to be processed, pumping can be started with a limestone laitance, wallpaper paste or the PM laitance pack (item no. 265389.003).

- ▶ Check that all the seals are present in the hose couplings and that the hoses are clear of material residues inside.
- ▶ Rinse the delivery line through with water.

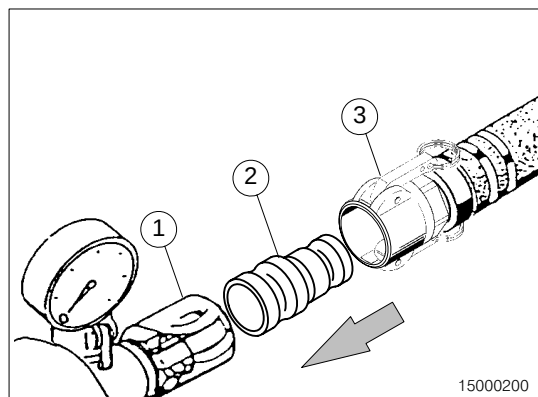


Operation



- 1 Bucket
- 2 Hopper
- 3 Delivery hose

- Connect the delivery hose (3) with the nut part of the reduction piece (2).



- 1 Pressure connection
- 2 Reduction part
- 3 Delivery hose

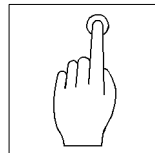
- Connect the delivery hose (3) with the nut part of the reduction piece (2).

With the first mixture, pump the laitance through the conveying hose. As it leaves the hose, collect the laitance in a suitable container and dispose of it.



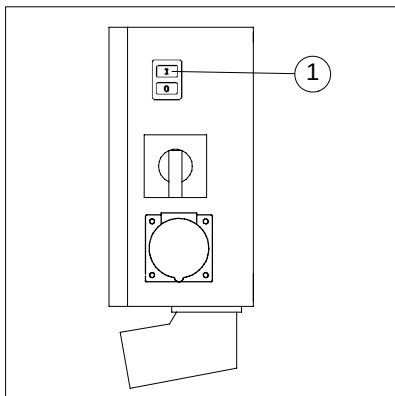
Note

The laitance lubricates the inside of the conveying hose and prevents blockages.



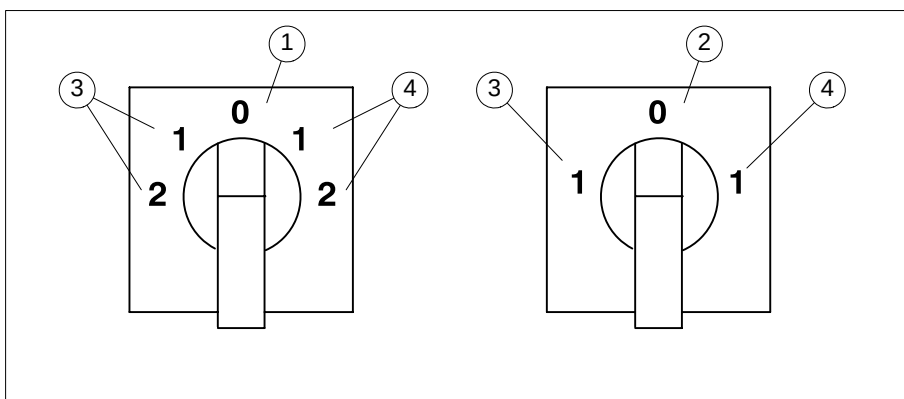
Mixing and pumping

Below is a description of the procedure for mixing and pumping material with the machine.



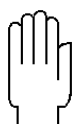
1 Motor start double pushbutton

- Start motor with the Motor Start pushbutton (1).



- 1 "Mix-OFF-Pump" selector switch, 380 V type
- 2 "Mix-OFF-Pump" selector switch, 230 V type
- 3 Mixing range
- 4 Pumping range

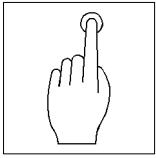
- With the "Mix-OFF-Pump" selector switch, switch the pump motor to Mix. With three-phase version optionally in stage I or II.



Caution

Never fill hopper when mixer is stationary!

- Fill the required mixing water into the reservoir and then gradually add the material to be mixed.
- Attach the electrical remote control to the conveying hose end.



If required, connect an air line to the spray gun from a separate compressor.

In luminous flux versions, the compressor must be connected to the power supply through a special feed point with residual current circuit breaker.

Only compressors equipped with the required safety devices, such as pressure gauges and safety valves, must be used.

Possible applications

The machine can be used for a variety of applications, such as grouting, injecting, spraying and structuring. Described below are a few possible applications.

Application of adhesive mortar

Most adhesives are supplied wet by their manufacturers. Only a particular amount of cement must be added.

- ▶ With the “Mix-OFF-Pump” selector switch, switch the pump motor to Mix. With three-phase version optionally in stage I or II.
- ▶ Start motor with the Motor Start pushbutton.
- ▶ Fill adhesive into the hopper, add the required amount of cement and mix well.
- ▶ With the “Mix-OFF-Pump” selector switch, switch the pump motor to Pump. With three-phase version optionally in stage I or II.

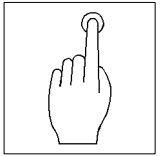
Maximum hose length is 20 m, NW 25.

To prevent material runout, fit a NW 25 stop valve to the end of the hose.



Caution

First, switch the pump off, then close the stop valve.



Mineral-based rendering

Mineral-based rendering is mixed with water according to manufacturer's instructions.

- ▶ With the "Mix-OFF-Pump" selector switch, switch the pump motor to Mix. With three-phase version optionally in stage I or II.
- ▶ Start motor with the Motor Start pushbutton.
- ▶ Fill the required mixing water into the hopper and add the dry mortar.
- ▶ Mix the material thoroughly.
- ▶ With the "Mix-OFF-Pump" selector switch, switch the pump motor to Pump. With three-phase version optionally in stage I or II.
- ▶ Fit a fine rendering spray gun, NW 25 with rubber nozzle, order no. 203051.005.



Danger

The spraying equipment operator must wear eye protection during spraying.

- ▶ The mixed mortar can now be sprayed.

Maximum hose length is 30 m, NW 25.

Usually, an air compressor with a capacity of approx. 200 l is sufficient to achieve a good spraying result.

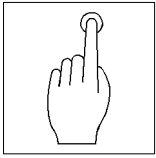
Synthetic renders

These are already supplied as liquids by their manufacturer and do not, therefore, have to be mixed.

- ▶ Start motor with the Motor Start pushbutton.
- ▶ With the "Mix-OFF-Pump" selector switch, switch the pump motor to Pump. With three-phase version optionally in stage I or II.

With these renders, switch directly to "Pumping" to process the material continuously.

- ▶ Fit a PM structure spray gun, to the end of the hose.

**Danger**

The spraying equipment operator must wear eye protection during spraying.

Use an auxiliary compressor with at least 600 l air.

Maximum hose length is 25 m, NW 25.

5.4 Blockages, causes and remedies

Blockages can occur inside the pump itself as well as in the delivery hose. When a blockage occurs, the flow of material at the end of the hose or the spray gun stops and the pressure gauge indicates a rising pressure. If a blockage occurs inside the pump, the motor may, in addition, stall.

Blockages can be avoided. However, they do still occur from time to time:

- As a result of insufficient lubrication of the delivery line.
- As a result of mortar which is hard to pump and segregates easily.
- As a result of leaks in the delivery line couplings.
- As a result of leaks in the delivery hoses.

Removing blockages

Rectify blockages as follows:

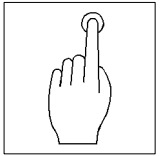
- ▶ Switch the pump off.
- ▶ Switch off the electric motor.

Pressure must be relieved prior to rectifying blockages.

**Danger**

You should only disconnect the delivery line when you have checked on the pressure gauge that the system is fully depressurized.

- ▶ Disconnect the delivery line and clear the blockages in the line by shaking and tapping it.
- ▶ With stubborn blockages, rinse the line with water.
- ▶ When you start the engine up again, add a cement grout to the delivery line.



5.5 Interrupting delivery

You can interrupt the delivery process at any time. This may become necessary if the machine malfunctions or if there is a blockage in the delivery line.



Danger

Never forget to depressurize the system before releasing the delivery hose from the pressure flange!

5.6 Cleaning

After completion of work, clean the machine and the delivery hose. This ensures continued proper functioning of its key components.

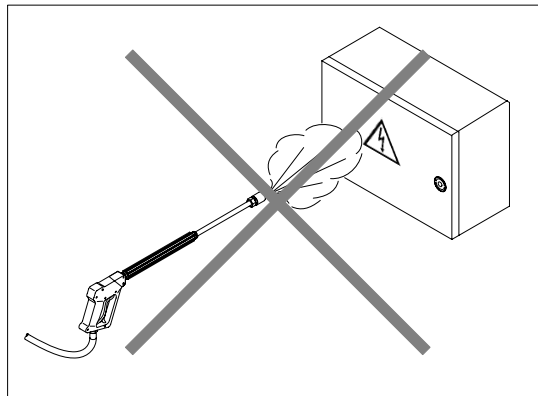


Environmental protection

During all cleaning work, observe the waste disposal regulations that apply to your region.

General

Prior to cleaning the machine with water or a steam jet (H.P. cleaner) or other cleaning agents, cover or seal all openings which water/steam or cleaning agents must not penetrate, for safety or operating reasons. Especially at risk are electric motors, control cabinets and electrical plug connectors.

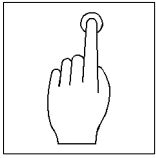


No water into electric systems



Note

In the first six weeks of operation, clean all painted surfaces with cold water only at a maximum water pressure of 5 bar. Do not use any aggressive cleaning additives. Only after this length of time has the paint hardened completely allowing you to use steam jets or similar tools.



Water which sprays the machine from all directions does not have any damaging effect. The system is splash-proof but not waterproof.



Caution

The machine and lines must be drained fully of residual water if there is a risk of freezing.



Caution

Do not direct the water jet at electrical machine components (e.g. control cabinet, electric motors).

- ▶ Clean hopper and agitator with water.
- ▶ Fill water into the hopper.
- ▶ Switch the pump on and pump water until clear water exits at the discharge outlet.

Swing the motor to one side to clean the machine.



Danger

Never reach into the moving parts of the machine, whether the machine is running or switched off.

Wash the machine clean with water. Rinse out the hopper.

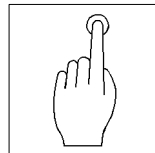
Delivery hoses

Material deposits inside the delivery hose can cause damage and can continue to accumulate and thereby reduce the hose cross-section. To allow problem-free operation at the next use, it is vital that all delivery hoses are clean.



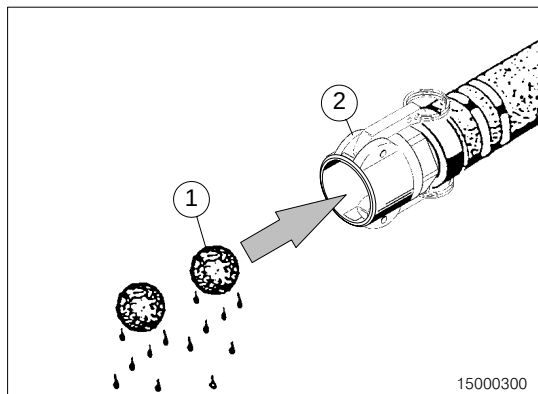
Danger

You clean the delivery line with compressed air at your own risk. Putzmeister accepts no liability for damage caused by compressed air cleaning.



Note

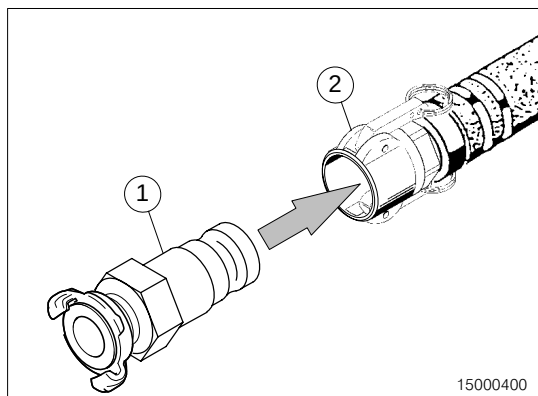
A frequent error committed when cleaning the delivery lines is for water to be pumped through the delivery line before a sponge ball has been inserted. This later leads to blockages in the delivery line since residual sand remains in the hose.



- 1 Sponge ball
- 2 Delivery hose

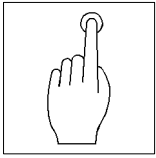
- Soak the Putzmeister sponge ball (1) in water and push it into the delivery hose (2).

The delivery hose is cleaned by water pressure. Use the water connector included in the accessory package for this purpose.



- 1 Water connector
- 2 Delivery hose

- Connect the water connector to the delivery hose.
- Attach the water connecting piece to the water hose.
- Use the water pressure to push the leavings and sponge balls out of the delivery hose.



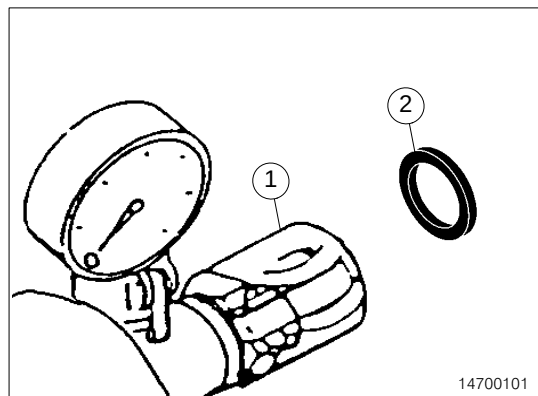
If the machine does not have a water pump and the water line pressure is not sufficient for cleaning the delivery hose, you must use the pump for cleaning.



Note

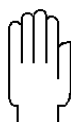
Using the pump for cleaning increases wear of the pump components. If the water line pressure is repeatedly insufficient, use an auxiliary water pump.

- ▶ Reconnect the delivery line to the outlet connection.
- ▶ Half fill the mixing drum with water.
- ▶ Start the pumping process and pump water through the delivery hose until the sponge ball exits the hose end.
- ▶ Repeat the cleaning process until only clean water exits the hose.



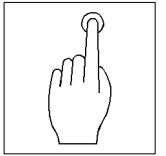
- 1 Pressure connection
- 2 Rubber seal

Clean all seals and the seal seats. Grease the seals before re-assembling them. Dirty couplings are not sealed and necessarily lead to blockages.



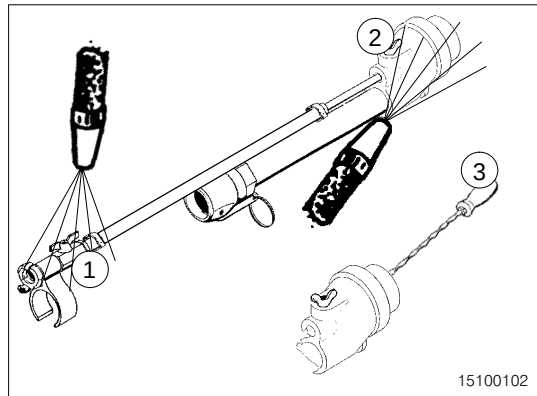
Caution

The machine and lines must be drained fully of residual water if there is a risk of freezing.



Spray gun

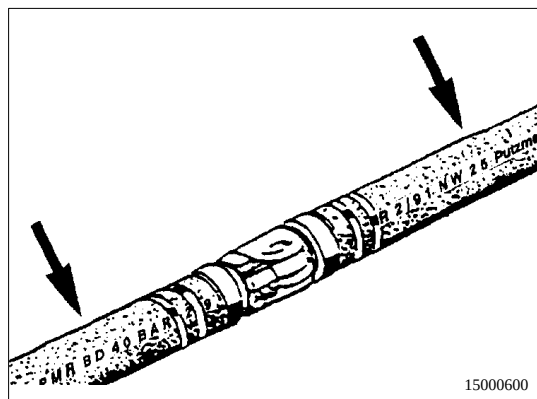
Clean the air cock and air nozzle tube on the spray gun. In addition, use the probe to clean the air nozzle tube.



- 1 Air cock
- 2 Air nozzle tube
- 3 Probe

5.7 Delivery hoses

You should use only original Putzmeister hoses, which are designed specifically to withstand the specified operating and braking pressure.

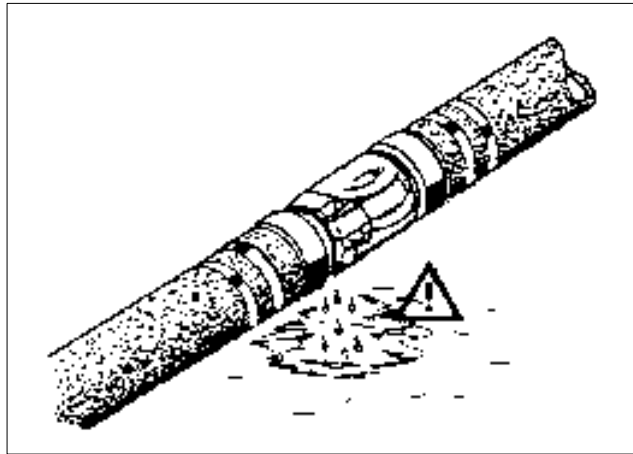
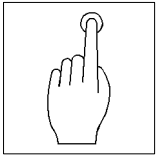


Hose type marking



Danger

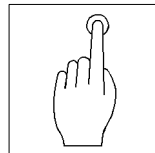
Hose reductions and tapers can cause blockages. Use only delivery pipes with the same nominal widths.



Note

Only couple hose couplings together once they have been cleaned. Special attention must be paid to seals. Soiled couplings are not properly sealed and allow water to leak out under pressure, which necessarily leads to blockages.

Using the correct hose connectors and fittings greatly avoids the danger of blockages forming. The quality of hoses is also a decisive factor in operational safety. For this reason, you must only use hose grades and couplings approved and recommended by Putzmeister. Each type of hose can be identified by its marking.



5.8 Machine shutdown

If the machine is to be stored or not to be used or any length of time, it must be lubricated and, if necessary, preserved.



Note

Preservation and greasing the machine prevents corrosion and premature ageing. It is necessary if the machine:

- *is not used for longer periods;*
- *is exposed to corrosive atmospheres during storage or transportation.*



Environmental protection

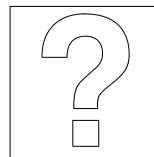
Disposal of the machine should be carried out by an authorised specialist.

- ▶ Lubricate the machine as described in Section -Lubrication diagram-.



Maintenance card: *Lubrication diagram*

- ▶ Only close down the machine when it is disconnected from the power supply.
- ▶ Preserve the machine with a suitable agent.



6 Faults, Causes and Remedies

This chapter gives you a summary of faults and their possible causes, and also ways in which you may rectify them.
Observe the safety regulations when searching for a fault.
Only suitably trained technicians may work on the electrical system.

6.1 Pump in general

This chapter describes the possible causes of faults and how to rectify them.

The machine does not start.	
Cause	Remedy
No power present.	Check the connection and fuse at the site distribution board. Maximum back-up fuse 10 A (400 V) / 16 A (230 V).
Cable connection to the site distribution board	Check plug connector and cable for damage.

Irregular flow of mortar.	
Cause	Remedy
The material is reaching the end of the hose irregularly and is spraying with force.	Check whether the hopper is nearly empty thus allowing air to be sucked in. For this reason, always ensure that there is sufficient material in the hopper.
The flow of material is being constantly interrupted without spraying.	Check whether the air tap on the spray gun is completely open. Check whether the delivery line is forming a loop or is kinked. Check on the spray gun to see if the air nozzle pipe is clear. If it is blocked, clean it.



Agitator in the hopper is not running.	
Cause	Remedy
The grille on the hopper is open or the safety switch is defective.	Close the grille on the hopper and check the safety switch.

6.2 Electrical system

This section describes the possible causes of faults in the electrical system and how to rectify them.

On power failure

If there is a site power failure, and the cause cannot be remedied immediately, you should clean the machine and the delivery lines at once.

See also section "Cleaning". Clean the machine and delivery hoses with mains water as described there.



Hinweis

Before you disconnect the delivery line, check on the pressure gauge to ensure that the system is fully depressurized. You must wear protective goggles.

Turn your face away when opening the line coupling.

- ▶ Loosen the tension rod of the auger pump and remove the pump.
- ▶ Press the auger out of the auger barrel and clean it.
- ▶ Clean the whole machine and reassemble it ready for operation.
- ▶ Locate and remedy the cause of the power failure.

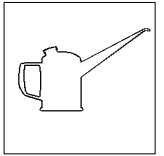


Maintenance chart: *Replacing the auger.*



Danger

Work on the electrical system and equipment of the machine must be carried out by a qualified electrician or by instructed persons under the supervision and guidance of a qualified electrician and in accordance with electrical engineering rules and regulations.



7 Maintenance

In this chapter you will find information on the maintenance work necessary for the safe and efficient operation of the machine.

Following the general maintenance information, you will find the maintenance charts necessary for this machine. A summary of the maintenance charts listed by number is included in the table of contents.

We should like here to emphasize that all prescribed checks, inspections and preventative maintenance work must be conscientiously carried out. Otherwise we will refuse any liability or warranty claim. Our After Sales department is available to you with advice and help at any time should you be in doubt.

7.1 Maintenance intervals

The following tables show the intervals for the various maintenance tasks listed by assembly. The associated maintenance charts can be found further on in this chapter.



Note

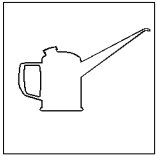
Have the initial after-sales service carried out by a Putzmeister Mörtelmaschinen GmbH After Sales service engineer, or by a dealer authorised by Putzmeister Mörtelmaschinen GmbH.

The machine operator responsible for the machine should be present for this service.

Welding work

The electronic components can be destroyed by external voltages during electrical welding operations. For this reason:

- Isolate control cabinet from power supply.



General

..... operating hours:	At least	Action	
	daily	Visual and function check on all safety equipment.	40-001
		Check all wear parts.	—
		Check delivery hoses and couplings.	—
		Visual inspection of electrical cabling.	40-001
	annually	Check threaded unions against tightening torque table.	—

Hopper

..... operating hours:	At least	Action	
	daily	After cleaning the machine, lubricate the free running bearing.	—

Drive motor

..... operating hours:	At least	Action	
every 10,000	every 3 years	Change transmission oil.	—

7.2 General tightening torques

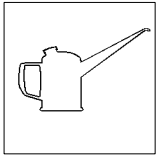
Tightening torques depend on bolt grade, thread friction and bolt head bearing area. The values given in the following tables are for guidance. These values should only be used if no other values are specified in the relevant chapters of the Operating Instructions or in spare parts sheets.



Caution

Bolts must always be replaced with bolts of the same size and grade.

Bolts with adhesive in the locking threads and self-locking nuts must always be replaced after removal.



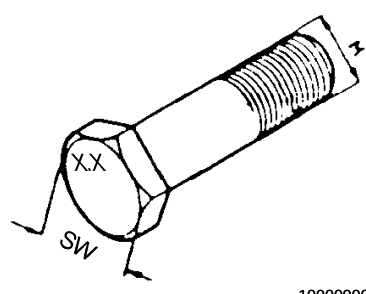
The tables below give the maximum tightening torques M_d in Nm for a coefficient of friction $\mu_{\text{total}} = 0.14$, thread lightly oiled or lightly greased.



Note

All tightening torques $\times 1.1$ apply for bolts with cement in the thread.

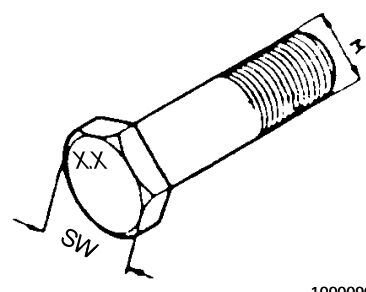
Set screws - metric triangular thread, DIN 13, Part 13



SW = Width across flats (A/F)
X.X = Grade 8.8, 10.9, 12.9

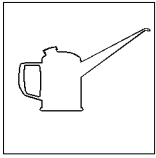
Dimensions [mm]		Tightening torque Md [Nm]		
M	SW	8.8	10.9	12.9
M 4	7	3.0	4.4	5.1
M 5	8	5.9	8.7	10
M 6	10	10	15	18
M 8	13	25	36	43
M 10	17	49	72	84
M 12	19	85	125	145
M 14	22	135	200	235
M 16	24	210	310	365
M 18	27	300	430	500
M 20	30	425	610	710
M 22	32	580	820	960
M 24	36	730	1050	1220
M 27	41	1100	1550	1800
M 30	46	1450	2100	2450

Set screws - metric precision thread, DIN 13, Part 13



SW = Width across flats (A/F)
X.X = Grade 8.8, 10.9, 12.9

	Dimensions [mm]		Tightening torque Md [Nm]		
	M	SW	8.8	10.9	12.9
M 8 × 1	13	27	39	46	
M 10 × 1.25	17	52	76	90	
M 12 × 1.25	19	93	135	160	
M 12 × 1.5	19	89	130	155	
M 14 × 1.5	22	145	215	255	
M 16 × 1.5	24	225	330	390	
M 18 × 1.5	27	340	485	570	
M 20 × 1.5	30	475	680	790	
M 22 × 1.5	32	630	900	1050	
M 24 × 2	36	800	1150	1350	
M 27 × 2	41	1150	1650	1950	
M 30 × 2	46	1650	2350	2750	



7.3 Lubricant recommendation

Suitable lubricants are listed in the tables below. Putzmeister accepts no liability for the quality of the lubricants listed or for changes in quality made by the lubricant producer without changing the grade designation.



Note

Putzmeister accepts no liability for damaged caused by mixing oils from different producers.

Drive motors

The drive motor is filled at the works with 0.8 l CLP ISO VG 220 lubricant, which must be changed every 10,000 h, or at least every 3 years.

Lubrication (manual)

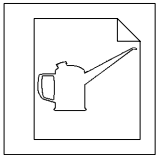
Use a lithium soap based multipurpose grease marked DIN 51 502: K2K, NLGI Class 2.



Environmental protection

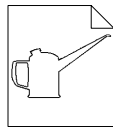
All operating materials, e.g. used oil, filters and auxiliary materials must be carefully collected and separated from other waste before disposal. Observe the national and regional regulations applicable to your area. Only work with waste disposal companies who are approved by the responsible authorities.

Make contact with the appropriate authorities or waste-disposal companies.



Visual checks

This maintenance chart describes visual checks which you must carry out before each maintenance task. You will find the maintenance intervals in the maintenance summary at the start of this chapter.



No further maintenance charts required.



No special tools required.



Danger

Inspect the electrical cables particularly closely and carefully. There is a danger of flash over from damaged cables, particularly when there is high air or ambient humidity.

General

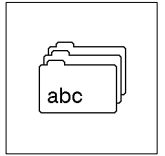
The general visual inspections which follow should be carried out before each job as well as before all maintenance work.

- ▶ Check that all safety equipment is available and in a fully functioning condition.

Electrical system

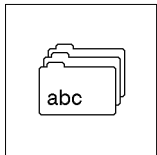
Should you locate any damage to the electrical system, you must have the damage rectified immediately by a qualified electrician.

- ▶ Check that all electrical connections are secure and free from corrosion.
- ▶ Check that the electrical cables have no breaks.
- ▶ Check the insulation on the electrical cables.



Index of Key Words

This chapter contains the main key words with the number of the page on which they are to be found as a header in the left-hand margin. This Index of key words is listed alphabetically by the main concepts. These are subdivided into associated sub-concepts, marked with a dash.



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