



Operating manual

Horizontal continuous mixer HM 24

Part 2 Overview, operation and service



Item no. of the operating manual:

00012081

HM 24, 400 V, 3 Ph, 50 Hz (steel mixing tube)

Item no. 00007874

HM 24, 400 V, 3 Ph, 50 Hz with removable
outlet flange, metering shaft 35 l/min

Item no. 00008783

HM 24, 400 V, 3 Ph, 50 Hz with rubber mixing tube

Item no. 00020357

HM 24, 400 V, 3 Ph, 50 Hz with rubber mixing tube,
controller for the level sensor and the external vibrator

Item no. 00036940

HM 24, 400 V, 3 Ph, 50 Hz with rubber mixing tube,
control cabinet and AVO 500

Item no. 00070219

HM 24, 400 V, 3 Ph, 50 Hz with rubber mixing tube,
control box and AV 1000

Item no. 00463945

HM 24, 400 V, 3 Ph, 50 Hz, 6.05 kW for 16 mm PAGEL
grouting mortar

Item no. 00596843



Read the operating manual prior to starting any work!

About us



About us

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1 General information

1.1 Information regarding the operating manual

- This operating manual provides important information and instructions on the correct use of the machine. A prerequisite for safe working is the observance of all stated safety guidelines and instructions.
- Furthermore, the local accident prevention guidelines and general safety instructions for the application area of the device are to be adhered to.
- Read the operating manual thoroughly before starting any work! It is a part of the product and has to be kept near the device and easily accessible to the personnel at all times.
- If the device is given to third parties, also include the operating manual.
- The figures in this manual are for presentation purposes of facts, not necessarily to scale and may slightly differ from the actual model of the device.

1.2 Division

The operating manual is divided into 2 books:

- Part 1 Safety/drinking water protection

General safety instructions horizontal continuous mixer/compulsory mixer

Item no.: 00146378

- Part 2 Overview, operation and service (this manual).

WARNING



Danger of injury due to incorrect operation!

Improper operation may lead to serious damage to persons and property.

- To ensure safe and proper operation of the machine, all parts of the operating manual must be read before starting work; all parts together are considered to be a single operating manual.

1.3 Keep the manual for future reference

The operating manual has to be available during the whole service life of the product.

General information



1.4 Display of safety and warning notices

In this manual, safety and warning notices are used in conjunction with signal words to raise safety awareness, indicate degrees of danger and explain safety measures.

Such safety and warning information may also be attached to the product in the form of signs, stamps or stickers.

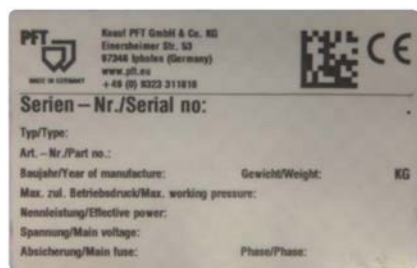
Structure of the safety and warning notices

All safety and warning notices consist of:

- The danger sign and signal word
- Information on the nature of the hazard
- Information on the source of the hazard
- Information on possible consequences of disregarding the hazard
- Measures to avert the hazard

Danger sign	Signal word	Significance
	Danger	Death or serious injury will occur if you do not take the precautions described.
	Warning	Death or serious injury may occur if you do not take the precautions described.
	Caution	Minor injury may occur if you do not take the precautions described.
	Note	Property damage may occur if you do not take the precautions described.
	Tip	An important piece of information about the product or the particular section of the manual to which special attention is to be drawn.

1.5 Name plate



The following details can be found on the name plate:

- Manufacturer
- Type
- Year of manufacture
- Machine number
- Permissible operating pressure

Figure 1: Name plate



1.6 EC Declaration of Conformity

Company: Knauf PFT GmbH & Co. KG
Einersheimer Straße 53
97346 Iphofen
Germany

declares under our sole responsibility that the machine:

Type of machine: HM 24

Type of equipment: Horizontal continuous mixer

Serial number:

Guaranteed sound power level: 78 dB

is in conformity with the following CE directives:

- Outdoor Directive (2000/14/EC),
- Machinery Directive (2006/42/EC),
- Electromagnetic Compatibility Directive (2014/30/EU),.

Operative Conformity Assessment according to Outdoor Directive 2000/14/EC:

Internal production control as per article 14 paragraph 2 in connection with annex V.

This declaration only refers to the machine in the state in which it has been placed on the market. Parts subsequently added by the user and/or subsequent interventions are not covered. This declaration ceases to be valid if the product is converted or changed without consent.

Person authorised to compile the relevant technical documentation:

- (Dipl. in Industrial Engineering, University of Applied Sciences) Michael Duelli, Einersheimer Straße 53, 97346 Iphofen.

The technical documentation is available from:

- Knauf PFT GmbH & Co. KG, Technical Department, Einersheimer Straße 53, 97346 Iphofen.

Iphofen

Dr York Falkenberg
Managing Director

Town/city

Name and signature

Details of signatory

General information



1.7 Quality Control sticker



Figure 2: Quality Control sticker

The following details can be found on the Quality Control sticker:

- CE confirmed as per EU directives
- Serial no / serial number
- Controller / signature
- Date of control

1.8 Intended use

1.8.1 Purpose of fitting block

The fitting block has been designed and constructed only for the intended use described below.

NOTE



Application range!

Primary use for water and neutral, non-adhesive liquids. Also suitable for air and neutral non-flammable gases.

- Maximum operating pressure (initial pressure) 16 bar.
- After-pressure infinitely adjustable from 1.5 to 6 bar.
- Smallest possible initial pressure 2.5 bar.
- Minimum pressure gradient (initial/after-pressure) 1 bar.
- Maximum media and ambient temperature 75 °C.
- Assembly position as desired, preferable vertical.



1.8.2 Purpose of flowmeter

NOTE



Application range!

The flowmeter serves for measuring the volume of transparent liquid and gas flows in closed pipes. Optionally, the flowmeter can also be used for flow monitoring.

⚠ CAUTION



Danger due to improper use!

Any use beyond the specified purpose of use and/or any other form of use of the flowmeter can lead to dangerous situations.

Therefore:

- Only use the flowmeter as intended.
- Always adhere to the usage directives of the material manufacturer.
- Strictly follow all instructions in this operating manual.

We accept no responsibility for damages caused by improper or unauthorised use.

The operator of the device is solely responsible for any damage arising from improper use.

1.8.3 Purpose of solenoid valve

NOTE



Application range!

Solenoid valves for liquid and gaseous media, aggressive or neutral, can be used in various temperature and pressure ranges

Type 6213 is a 2/2 way solenoid valve with straight passage, normally closed, with a permanently coupled membrane system. It switches from 0 bar and is universal in use for liquids. A minimum differential pressure of 0.5 bar is necessary for complete opening.

Technical data



2 Technical data

2.1 General information



Figure 3: Dimension sheet in mm

Information	Value	Unit
Empty weight approx.	100 - 135	kg
Length	1,870	mm
Width	670	mm
Height	970	mm

Material hopper dimensions

Information	Value	Unit
Filling height	970	mm
Outlet height	650	mm
Material hopper volume	110	l

2.2 Connection values of water



Detail	Value	Unit
Operating pressure, min.	2.5	bar
Connection	½	inch

Figure 4: Water connection



Technical data

2.3 Operating conditions

Environment	Detail	Value	Unit
	Temperature range	2 - 45	°C
	Relative humidity, max.	80	%
Duration	Detail	Value	Unit
	Max. operating time at a stretch	8	hours
Electrical details	Detail	Value	Unit
	Voltage, 3Ph 50 Hz	400	V
	Power consumption, max.	6.8	A
	Minimum fuse protection, type C	16	A
	CEE connection 5-pin	16	A
	Mixer motor speed	280	Rpm
	Performance		
Mixer motor power	3 kW		
	3.3 kW		
	5.5 kW		
	6.05 kW		

2.4 Power values

Power values HM 24	Detail	Value	Unit
	Mixing performance approx. *	20 - 50	l/min
	Maximum grain size	6	mm

* Standard values depending on mortar quality, mortar composition and mortar consistency. The guidelines of the mortar manufacturer are ultimately authoritative.

2.5 Sound power level

Guaranteed sound power level L_{WA}

■ 78 dB(A)

2.6 Vibrations

Weighted effective value of acceleration to which the upper body parts are exposed $<2.5 \text{ m/s}^2$

Transport, packing and storage



3 Transport, packing and storage

3.1 Safety instructions for transport

Improper transport

NOTE



Damage from improper transport!

Improper transport may cause substantial property damage.

Therefore:

- When unloading the packages on delivery, as well as transport within the company, pay attention and observe the symbols and instruction on the package.
- Use only the specified anchorage points.
- Remove packaging only shortly before the assembly.

Suspended loads

⚠ WARNING



Danger to life from suspended loads!

When lifting heavy loads, there is danger to life from falling parts or uncontrolled swinging parts.

Therefore:

- Never step under suspended loads.
- Observe the instructions regarding the provided anchorage points.
- Do not attach to projecting machine parts or eyelets of attached components and ensure safe fit of the sling gear.
- Only use approved lifting gear and accessories with a sufficient load-bearing capacity.
- Do not use torn or frayed ropes and belts.
- Do not lay ropes and belts over sharp edges and corners, do not knot or twist.
- When ropes and chains are used in construction operations, the provisions contained in the accident prevention regulation "Load suspension devices in lifting gear operations" (VBG 9a) should be complied with. The following sections contain instructions for scenarios in which ropes and chains are used as lifting means.



3.2 Transport inspection

On receipt check the delivery immediately for completeness and transport damage.

In case of externally visible transport damage, proceed as follows:

- Do not accept the delivery or under reserve only.
- Note the extent of damage on the transport documentation or on the delivery note of the carrier.
- Initiate complaint process.

NOTE



Report any defect as soon as it is detected. Claims for damages can be asserted only within the valid warranty period.

3.3 Packaging

For packaging

The individual packages have to be packed in accordance with the transport conditions to be expected. Only environmentally-friendly materials were used for the packaging.

The packaging should protect the individual components until the assembly from transport damage, corrosion and other damage. Therefore do not destroy the packaging and remove only shortly before the assembly.

Handling packaging materials

If no agreement for the recovery of the packaging has been made, separate materials according to type and size and reuse or recycle.

NOTE



Environmental damage due to incorrect disposal!

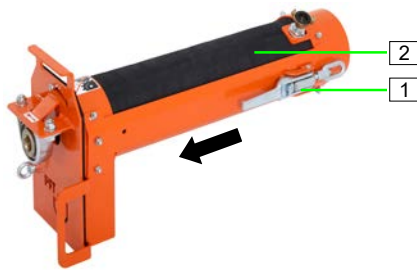
Packaging materials are valuable raw materials and in many cases they can be reused or reconditioned and recycled.

- Dispose of packaging materials in an environmentally-friendly way.
- Observe the applicable local disposal regulations. If required hand over the disposal to a specialist.

Transport, packing and storage



3.4 Transport in individual parts



The mixing tube can be removed in order to make it easier to transport the machine:

1. Loosen the quick closures (1) and take out the mixing tube (2) forward.

Figure 5: Individual parts

3.5 Transporting a running machine

⚠ CAUTION



Danger of injury from discharged mortar!

Injuries to face and eyes can occur.

Therefore:

- Before opening the couplings ensure that there is no more pressure on the hoses (observe display at mortar manometer).

Carry out the following steps before beginning the transport:

1. First unplug the mains cable.
2. Undo all other cable connections, water supply lines and hoses.
3. Remove loose parts during crane transport.
4. Start transport.

4 Description

4.1 Overview

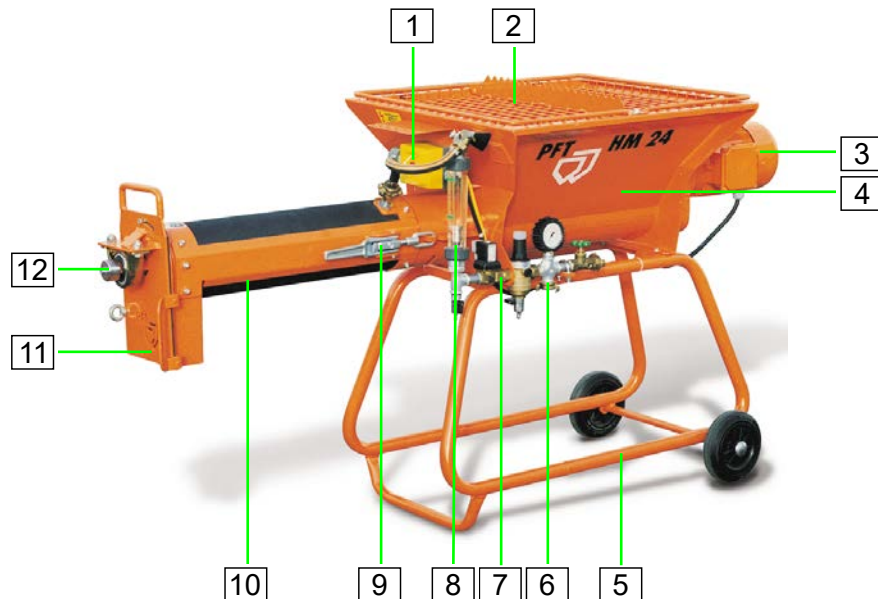


Figure 6: Table of the assembly groups

- | | |
|--|--|
| [1] "ON/OFF" pushbutton, is also emergency stop switch | [2] Protective grille with sack opener |
| [3] Mixer motor | [4] Material hopper |
| [5] Tubular frame | [6] Water inlet |
| [7] Water manifold | [8] Water flow meter |
| [9] Quick closure at mixing tube | [10] Rubber mixing tube |
| [11] Mortar outlet | [12] External bearing |

4.2 Brief description of HM 24



Figure 7: HM 24

The HM 24 400V is the all-rounder among PFT screw mixers. Not only can the machine be used to process any lime and cement-based ready-mix dry mortar with a grain size of up to 6 mm; thanks to PFT modular technology, the machine is set up for the desired filling in no time at all, be it bagged goods, silo/container or pneumatic filling by means of an injection hood and PFT SILOMAT conveying system.

Description



4.3 Fields of application



For all lime and cement-based ready-mixed dry mortar, such as:

- Masonry mortar
- Light masonry mortar
- Adhesive and reinforcement mortar
- Flow and joint mortar
- Cement plasters
- Finishing plaster
- Textured plaster
- Insulating plasters
- Levelling compounds
- Sgraffito
- Screed mortar
- Facing mortar
- Lime plaster
- Reconstruction plaster
- ... and much more

4.4 Advantages at a glance



- robust construction
- easy operation
- minimum maintenance and cleaning expense
- smooth, trouble-free operation
- low filling height
- comfortable transportation
- maintenance-free square external bearing
- protected quick closure
- GS certified by the building trade association and compliant with CE directives



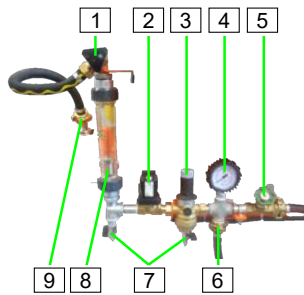
New PFT rubber mixing tube for all continuous mixers

- best suitable for processing adhesive mortar
- no long-term caking of material
- improved mixing quality
- easy and thorough cleaning
- low wear
- cost-effective wear parts
- can be retrofitted to current PFT continuous mixers

4.5 Description of assemblies

The PFT HM 24 continuous mixer consists of the main components described in the following chapters.

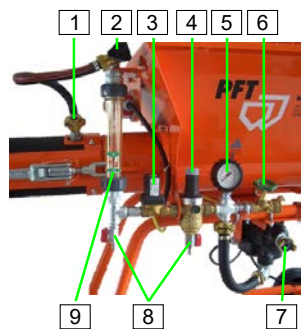
4.5.1 Water manifold



- [1] Needle valve water quantity
- [2] Solenoid valve
- [3] Pressure reducer
- [4] Water pressure gauge
- [5] Water sampling valve
- [6] Water connection from water supply
- [7] Drain tap for frost protection
- [8] Water flow meter 100 - 1,000 l/h
- [9] Water to mixing tube

Figure 8: Water tap assembly

4.5.2 Water manifold with booster pump



- [1] Water to mixing tube
- [2] Needle valve water quantity
- [3] Solenoid valve
- [4] Pressure reducer
- [5] Water pressure gauge
- [6] Water sampling valve
- [7] Water connection to booster pump from the water supply
- [8] Drain tap for frost protection
- [9] Water flow meter 100 - 1,000 l/h

Figure 9: Water tap assembly

4.5.3 Control box



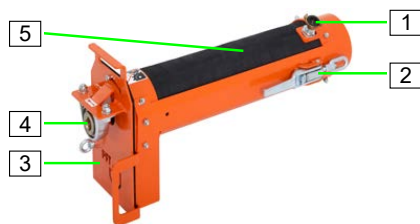
- [1] Pushbutton for control voltage "ON/ OFF"
- [2] Dummy connector / connection for level sensor
- [3] Main reversing switch is also emergency-stop switch
- [4] Safety socket for connection of booster pump
- [5] CEE mounted socket for mixer motor connection
- [6] CEE mounted socket for connection of vibrating unit
- [7] Yellow control lamp, change the direction of rotation

Figure 10: Assembly unit control box

Description



4.5.4 Rubber mixing tube



Part no. 00012594

- [1] Water supply to mixing tube
- [2] Quick closure
- [3] Removable star plate for mortar outlet flange
- [4] Square external bearing
- [5] Rubber mixing tube

Figure 11: Rubber mixing tube assembly

4.5.5 Mixing shaft



Item no. 00021495

- Mixing shaft HM 2002 (3 levels) square spindle with reamer

Figure 12: Mixing shaft assembly

4.5.6 Dosing shaft



Item no. 00002569

- Dosing shaft 35 l/min for HM 22/24

Figure 13: Dosing shaft assembly

4.6 Accessories



Extension cable 5 x 2.5 mm², RED 5-16 A – 50 m (400 V, 3 Ph)

- Item no. 20423350



Water hose/air hose DN19 Geka | Geka - 40 m

- Item no. 20212100



Water pump as standalone suction pump AV 1000 with integrated pressure cut-off and flow monitor, 230 V, 1 Ph, 50 Hz, 0.6 kW

- Item no. 00493686



Inlet strainer complete with stainless steel filter screen

- Item no. 00136619



Water hose/air hose DN12 Geka | Geka - 5 m

- Item no. 20211100

Description



Spray nozzle DN19 ($\frac{3}{4}$ ") Geka

- Item no. 20215700



Container attachment - 142 litres for G 4 / HM 2 / HM 24 / HM 2006

- Item no. 00453469



Dosing shaft 25 l/min for HM 22/24

- Item no. 00002111



Dosing shaft 50 l/min for HM 22/24

- Item no. 00010163



Dosing shaft 80 l/min for HM 22/24

- Item no. 00045639



Mixing shaft HM 24 earth-moist

- Item no. 00513092

You can find further accessories on the internet at www.pft.net or from your PFT construction machinery dealer.

5 Operation

5.1 Safety

Personal protective equipment

The following protective equipment has to be worn for all operative work:

- Protective clothing
- Protective goggles
- Protective gloves
- Safety shoes
- Hearing protection



Further protective equipment that is to be worn during particular jobs will be pointed out separately in the warning instructions of this chapter.

Basic information

WARNING



Danger of injury due to incorrect operation!

Improper operation may lead to serious damage to persons or property.

Therefore:

- Carry out all operating steps according to the instructions in this user manual.
- Prior to starting your work, ensure that all components are complete and undamaged.
- Prior to starting your work, ensure that all covers and protection devices are installed and work as intended.
- Never operate the machine with defective components and protective devices.
- Never disable protective devices during operation.
- Ensure order and cleanliness in the work area! Loose components and tools on top of one another or lying about pose potential accident risks.
- Increased noise level may cause permanent hearing deficiencies. At close range of the machine 78 dB(A) can be exceeded due to operational conditions. Close range is a distance of less than 5 metres to the machine.

5.1.1 Safety rules

CAUTION



Observe the regional safety rules for mortar conveyors and mortar guns!

5.1.2 Monitoring the machine

⚠ WARNING



Access by unauthorised persons!

- The machine may only be operated when monitored.

5.1.3 Hazardous dusts



Figure 14: Dust protection

⚠ WARNING



Danger of damage to health!

In the long term, inhaled dust can lead to lung damage or have other adverse health effects.

- Use suitable face protection.

NOTE



The machine operator or the person working in the dusty area always has to wear a dust protection mask when filling the machine!

The rules of the Committee on Dangerous Substances (AGS) can be found under Technical Rules for Dangerous Substances (TRGS 559).

5.2 Inspection by machine operator

- Prior to each shift, the machine operator has to examine the effectiveness of the control and safety devices, as well as the proper fitting of the protection devices.
- The safe working condition of construction machinery has to be checked by the machine operator during operation.
- If the safety devices show any defects or if any other defects are detected that compromise a safe operation, the supervisor has to be informed immediately.
- In case of defects that cause harm to persons, the operation of the construction machine has to be stopped to eliminate the defects.

5.3 Preparing the machine

Prior to operating the machine carry out the following steps for preparing the machine:

5.3.1 Risk of injury due to rotating dosing shaft



Figure 15: Grille cover

⚠ WARNING



Rotating dosing shaft!

Risk of injury when reaching into the material hopper.

- During machine preparation and operation the grille cover (1) must not be removed.
- Never reach into the running machine.

5.3.2 Setting up the machine



Figure 16: Setting up the machine

Install the machine on stable and even ground and secure it against accidental movements:

- Do not tilt or roll the machine away.
- Place the machine where it cannot be hit by any falling objects.
- The controls must be freely accessible.
- Maintain a clearance of approx. 1.5 metres around the machine.

5.3.3 Connecting the power supply

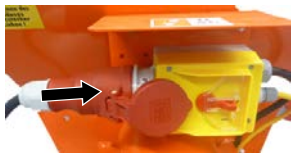


Figure 17: Connecting the power supply

On/off switch

1. Only connect the machine to three-phase current with 400V.

⚠ DANGER



Danger to life from electric current!

The electrical connection must be fused correctly:

- Only connect the machine to a power source with an approved RCD (residual current device) of type A (30 mA).

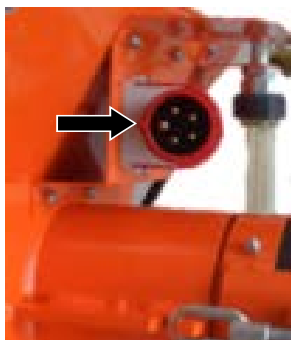


Figure 18: Connecting the power supply

Control box

1. Only connect the machine to three-phase current with 400V.

⚠ DANGER



Danger to life from electric current!

The electrical connection must be fused correctly:

- Only connect the machine to a power source with an approved RCD (residual current device) of type A (30 mA).

Operation

5.3.3.1 Connecting the individual connectors

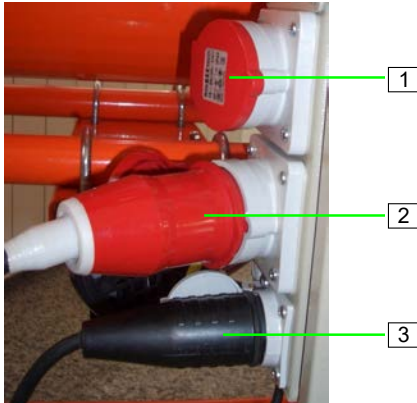


Figure 19: Power connections

⚠ WARNING



Danger to life from rotating parts!

Improper operation may lead to serious damage to persons or property.

- The respective drive (motors) must be operated only with the control box of the machine.

1. Connect the power supply for the vibrating unit (1) (if available).
2. Connect the power supply for mixer motor (2).
3. Connect the power supply for the booster pump (3).



The booster pump is necessary if the water pressure falls below 2.5 bar during running operation of the machine.

5.3.4 Checking the direction of rotation



Figure 20: LED on the on/off switch

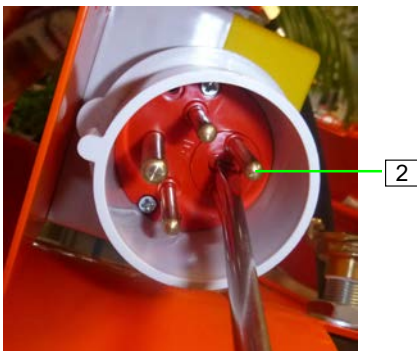


Figure 21: Turn the contacts on the reversible contact plug

On/off switch

Rotary field control:

- All three phases present and rotary field OK, LED (1) green is permanently lit
- One phase missing, LED (1) flashes red
- L1 missing, LED (1) flashes red 1x (fast)
- L2 missing, LED (1) flashes red 2x (fast)
- L3 missing, LED (1) flashes red 3x (fast)
- Rotary field wrong, LED (1) red is permanently lit

The HM 24 continuous mixer is equipped with a phase sequence indicator which lights up if the direction of rotation is incorrect (observe the direction of rotation arrow on the mixing tube).

To change the direction of rotation, the HM 24 continuous mixer is equipped with a reversible contact plug, remove the power cable and twist the contacts (2) with a screwdriver.



Figure 22: Checking the direction of rotation

Control box

1. Turn the main reversing switch (1) to position "I".
2. If the yellow control lamp (2) "Change direction of rotation" lights up, the direction of rotation must be changed on the main reversing switch (1).
3. Turn the main reversing switch (1) to position "0".
4. Push the metal bracket in the opposite direction.
5. Turn the main reversing switch (1) to position "I".

NOTE



If the direction of rotation is wrong, the following steps must be carried out:

- The main reversing switch (1) is locked in the "0" position by pushing the metal bracket to the left or right in a pre-setting and the direction of rotation is thus selected.
- If the switch is to the left, it can be switched back to zero, but is blocked for the right position.
- A number is printed on the metal bracket, which indicates the position in which the switch is blocked.

5.3.5 Checking the strainer screen

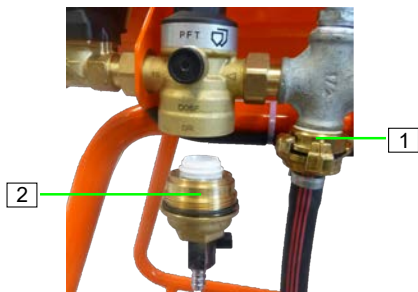


Figure 23: Strainer screen without booster pump



Figure 24: Strainer screen with booster pump

1. Check whether the strainer screen (1) in the water inlet is clean.
2. Remove the strainer screen from the water inlet and clean it.
Strainer screen for Geka coupling:
 - Item no. 20152000
3. Reinsert the strainer screen.
4. Remove the brass screen cup (2) from the pressure reducer.
5. Check whether the strainer screen in the pressure reducer is clean.
Dirt trap screen for pressure reducer:
 - Item no. 20156000
6. Screw in brass screen cup (2) again.

Operation

5.3.6 Connecting the water supply



Figure 25: Water supply connection without a booster pump

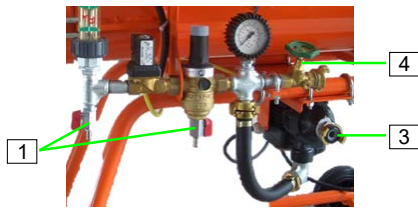


Figure 26: Water supply connection with a booster pump

1. Close water draining cocks (1).
2. Clean the water hose (2) from the water supply and bleed.
3. Connect the water hose (2) to the water inlet (3).
4. Open the water tap of the water supply line.
5. Open the water sampling valve (4).
6. As soon as water comes out at the water extraction valve (4), close it again.

NOTE



Use only clean water free of solids. The minimum pressure is 2.5 bar when the machine is running.

■ Observe the Drinking Water Protection Ordinance in Part 1

5.3.6.1 Connection of water from water tank



Figure 27: Pressure booster pump

- Item no. of pressure booster pump AV1000/1 (1): 00493686
- The connected pressure booster pump ensures the required water pressure of at least 2.5 bar.

NOTE



When working with water from the barrel, the inlet strainer must be fitted with a filter screen (item no. 00136619)
(Bleed the booster pump)

NOTE



The booster pump must not run dry to avoid any damage!



Figure 28: Suction strainer complete with filter screen

5.3.7 Switching on the machine



Figure 29: Switching on the machine

On/off switch

1. Switch on the machine at the on/off switch (1).



Figure 30: Switching on the machine

Control box

1. Turn the main reversing switch (1) to position "I".
2. Switch the machine on by pressing the green pushbutton (2) control voltage "ON".

Operation

5.3.8 Setting the water quantity

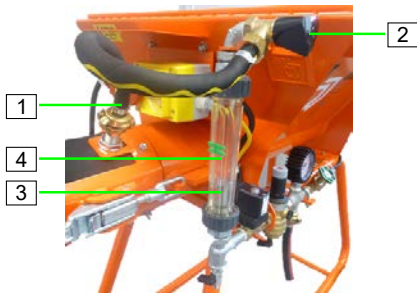


Figure 31: Setting the water quantity

1. Remove the water hose (1) from the mixing tube.
2. Close the needle valve (2).
3. Then open the needle valve (2) two turns.
4. In this position, the water quantity is approx. 200 l/h.
5. Adjust the anticipated amount of water required at the needle valve (2), which can be seen at the cone (3) in the sight glass of the water flow meter (4).
6. The material consistency can be adjusted using the needle valve (2).

NOTE



Turning the needle valve in clockwise direction causes lesser water flow so that the material becomes viscous and vice versa.

The specifications of the material manufacturer must be observed here.



Any interruption in the mixing operation results in a slight irregularity in the consistency of the material. This irregularity normalises by itself as soon as the machine has been working for a short while.

Therefore it is important not to change the water quantity for each irregularity. Wait until the consistency of the material has set again.

7. Connect the water hose (1) to the mixing tube.
8. Switch off the machine at the phase inverter by pressing the red pushbutton control voltage "OFF".

5.3.9 Feeding dry material to the machine



Figure 32: Bagged goods

1. Fill the bagged material into the material hopper.

⚠ CAUTION



Danger of injury at the sack opener!

The sharp edges of the sack opener pose a risk of injury.

- Wear safety gloves.

5.4 Shutdown in case of emergency

Shutdown in case of emergency

In dangerous situations, machine movements have to be stopped as quickly as possible, and the power supply has to be disconnected.



After the rescue operations

In case of danger proceed as follows:

1. Immediately switch off the air compressor at the main reversing switch or on/off switch.
2. Secure the main reversing switch or on/off switch against start-up.
3. Inform responsible person at the operational site.
4. If necessary call for medical assistance and fire brigade.
5. Recover persons from the danger zone, initiate First Aid measures.
6. Keep access routes free for emergency vehicles.
7. If the severity of the emergency permits, inform the competent authorities.
8. Assign specialised personnel with the troubleshooting.

⚠ WARNING



Danger to life from premature reactivation!

On reactivation there is danger to life for all persons in the danger zone.

- Ensure that the danger zone is clear before switching the machine back on.
- Check the system before reactivation and ensure that all safety equipment is installed and functional.

9. Check the system before reactivation and ensure that all safety equipment is installed and functional.

5.5 Putting the machine into operation

5.5.1 Feeding material to the machine

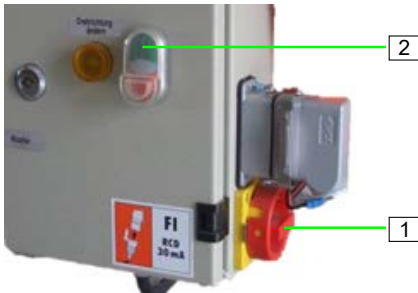


On/off switch

1. Switch on the machine at the on/off switch (1).
2. Check mortar consistency at the mortar outlet.

Figure 33: Switching on the machine

Operation

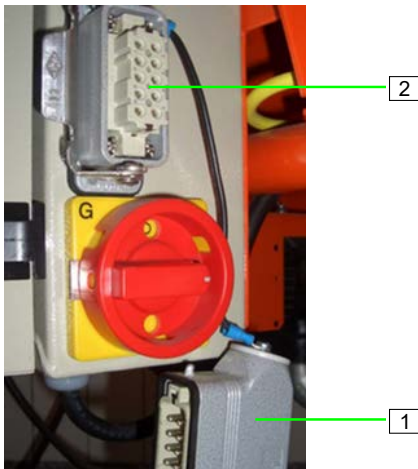


Control box

1. Turn the main reversing switch (1) to position "I".
2. Switch the machine on by pressing the green pushbutton (2) control voltage "ON".
3. Check mortar consistency at the mortar outlet.

Figure 34: Switching on the machine

5.6 Level sensor



Working with the level sensor

1. Remove dummy plug (1) from control box.
2. Connect the level sensor plug connector to the control cabinet (2).

NOTE



The level sensor monitors and controls the material level in the mortar hopper or in the material hopper of the delivery pump.

Figure 35: Level sensor

5.7 Applying mortar

⚠ WARNING



Danger of injury from discharged mortar!

Discharged mortar may lead to injuries to eyes and face.

- Always wear protective goggles.
- Always position yourself in such a way that you are not hit by the mortar being discharged.

5.8 Interruption of work

NOTE



Generally, the setting times of the materials to be processed must be observed. (Pay attention to outside temperature when doing so).

The guidelines of the material manufacturers have to be observed regarding breaks.

NOTE



Clean the mixing tube depending on the setting time of the material and the duration of the interruption (pay attention to outside temperature).

5.9 Switching off the machine



Figure 36: Switching off the machine

On/off switch

1. Switch off the machine at the on/off switch (1).

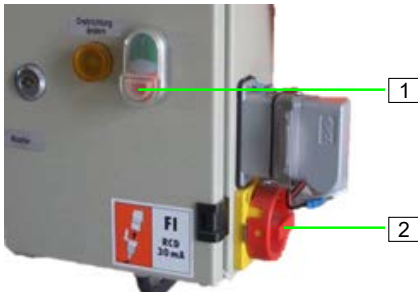


Figure 37: Switching off the machine

Control box

1. Switch off the machine by pressing the red pushbutton (1) control voltage "OFF".
2. Turn the main reversing switch (2) to position "0".

5.10 Action in case of power failure



Figure 38: Turn the main reversing switch to the "0" position

Turn the main reversing switch/phase inverter to the "0" position

1. Turn the main switch or on/off switch to the "0" position.
2. Have the power supply connection checked by an expert.

NOTE



Always observe the setting time of the material to be processed:

Clean the system and mortar hoses depending on the setting time of the material and the length of the interruption (pay attention to outside temperature).

The guidelines of the material manufacturers have to be observed regarding breaks.

NOTE



The machine is equipped with a restart interlock. In case of a power failure, this must be started as follows.

3. Switch on the machine at the on/off switch.
4. Turn the main reversing switch to position "I" and switch the control voltage "ON" via the green pushbutton.



Figure 39: Set the phase inverter to the "0" position

5.11 Measures in case of risk of frost

⚠ CAUTION



Damage by frost!

Water that expands on freezing inside the component can cause serious damage.

Therefore:

- Only install dry parts.

Carry out the following steps when the pump is not operating and there is a danger of frost.

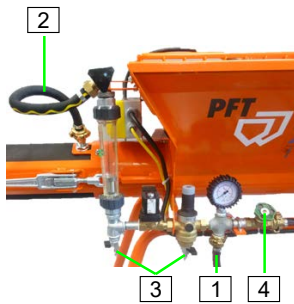


Figure 40: Disconnect water supply

Without booster pump

1. Disconnect the water hose (1) from the water inlet.
2. Disconnect the water hose (2) from the water inlet at the mixing tube.
3. Open the water drain cocks (3) and water sampling valve (4).
4. Connect an air hose with an air compressor to the water inlet (1) and use low pressure to blow the water manifold dry.

NOTE

Make sure that the water fully flows out of the water manifold.

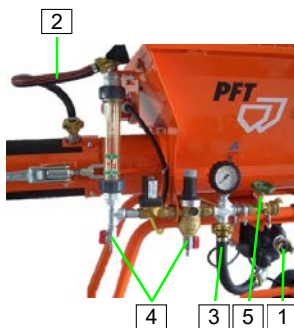


Figure 41: Disconnect water supply

With booster pump

1. Disconnect the water hose (1) from the water inlet of the booster pump.
2. Disconnect the water hose (2) from the water inlet at the mixing tube.
3. Disconnect the water hose (3) from the water fitting.
4. Open the water drain cocks (4) and water sampling valve (5).
5. Connect an air hose with an air compressor to the water inlet of the water fitting instead of the water hose (3) and use low pressure to blow the water manifold dry.

NOTE

Make sure that the water fully flows out of the water manifold.

5.12 Measures to be taken in case of water outage

NOTE

Water can be supplied to the machine from a container by means of suction strainer (item no. 00136619).

Operation



5.13 Ending work / cleaning the machine

5.13.1 Cleaning

- Clean the machine daily at the end of work and in case of extended breaks.

NOTE



Water can enter sensitive machine parts!

- Before cleaning the machine cover all openings in which no water must enter for safety and functional reasons (e.g.: electric motors and control cabinets).
- Remove the covers completely after cleaning.

5.13.2 Secure against restarting

⚠ WARNING

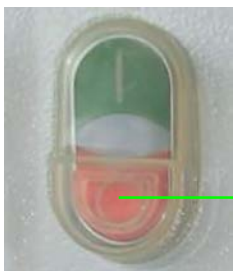


Danger to life from unauthorised restarting!

When working with the machine there is the risk that the energy supply is switched on without authorisation. This poses a danger to life for the persons in danger area.

- Before starting work, switch off all electrical power supplies and secure them against being switched back on again.
- If the protective covers are removed for cleaning purposes, it is essential that they be properly reattached when work is finished.

5.13.3 Emptying the mixing tube



1



2

The machine must be cleaned daily after work and before prolonged pauses:

1. Stop filling material into the material container shortly before end of work.
2. As soon as thinner machine appears at the mortar outlet, switch the machine off by pressing the red push button (1) for control voltage "OFF" or the on/off switch (2).
3. Switch the machine on again and collect the thinned material in a separate container.

Figure 42: Switching off

5.13.4 Cleaning the mixing shaft

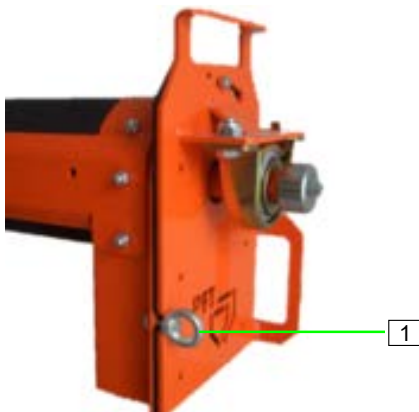


Figure 43: Loosen ring nut

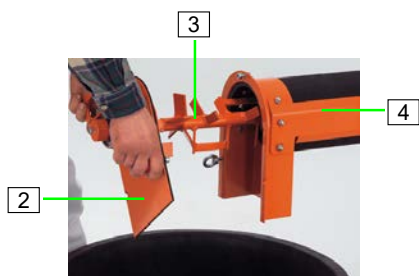


Figure 44: Remove the mixing shaft



Figure 45: Greasing the bearing journal

1. Loosen ring nut (1).

2. Turn the star plate (2) to the left. Pull it forward from the mixing tube (4) with the mixing shaft (3) and clean.

3. Lightly grease the bearing journal (5) on the mixing shaft.

5.13.4.1 Cleaning the mixing tube



Figure 46: Cleaning the mixing tube

1. Release the quick closures (1) on both sides.
2. Remove the mixing tube and clean it thoroughly.
3. The rubber mixing tube can be dismantled for cleaning.
4. To do this, pull the rubber mixing tube (2) out of the holder for the rubber mixing tube (3) and clean it thoroughly.

⚠ CAUTION



Danger of crushing due to the mixing tube!

Note the weight of the mixing tube when removing and installing it.

Operation

5.13.4.2 Setting the mixing shaft

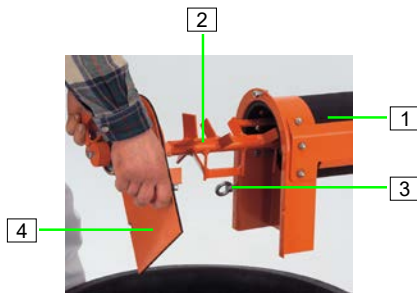


Figure 47: Setting the mixing shaft

NOTE



When installing the parts, make sure they are clean and dry.

Pay attention to the correct fit of metering and mixing shaft.

Always keep the quick closures and gaskets clean.
Grease the bearing journal and connecting pieces of the mixing shaft.

1. Assemble clean and dry parts only.
2. Fit the cleaned mixing tube (1) and close the quick closures on both sides of the mixing tube.
3. Move the cleaned mixing shaft (2) into the mixing tube and connect with dosing shaft.
4. Fasten the star plate (4) using the ring nut (3).

5.13.5 Cleaning the material hopper

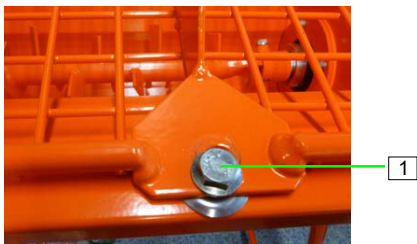


Figure 48: Remove the protective grille



The inside of the material hopper can be cleaned with a water hose after having been emptied completely.

1. Loosen the screw (1).
2. Remove the protective grille.
3. Clean material hopper.

5.13.6 Cleaning the dosing shaft

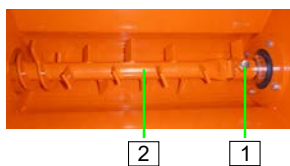


Figure 49: Cleaning the dosing shaft

1. Loosen the screw (1).
2. Remove the dosing shaft (2) and clean it.
3. Reinsert the cleaned dosing shaft and secure with screw.
4. Set the protective grille and secure it.

5.14 Reaction in the event of faults

Reaction in the event of faults

The following applies as a general rule:

1. In the event of faults presenting immediate danger to persons or property, activate the emergency OFF function immediately.
2. Determine cause of the fault.
3. If the rectification of faults requires works in the danger zone, switch off the system and secure against restarting.
4. Inform the manager on site immediately about the fault.
5. Depending on the type of fault, commission authorised skilled personnel or rectify the fault yourself.



The following fault table gives information on who is authorised to rectify the fault.

5.14.1 Safety

Personnel

- The work for rectification of faults described here can be carried out by the operator, unless marked otherwise.
- Some works must be carried out only by specially trained skilled personnel or exclusively by the manufacturer. Information on this can be found in the description of the individual faults.
- Work on electrical systems must always only be carried out by qualified electricians.

Personal protective equipment

The following protective equipment has to be worn for all maintenance work:

- Protective clothing
- Protective goggles
- Protective gloves
- Safety shoes

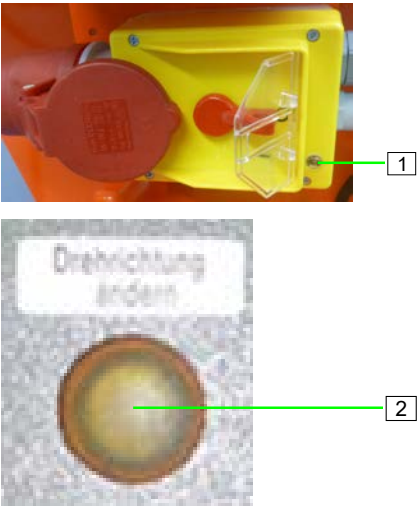
5.14.2 Faults

The following chapter describes possible causes for faults and the activities carried out for their rectification.

In case faults occur frequently, shorten the maintenance intervals in accordance with the actual load.

Contact your dealer if malfunctions occur that cannot be solved using this manual.

5.14.3 Fault displays



The following installation indicates faults:

Pos.	Light signal	Description
1	Green control LED	LED red flashing → one phase is missing LED red flashing 1x fast→ L1 is missing LED red flashing 2x fast→ L2 is missing LED red flashing 3x fast→ L3 is missing LED red permanently lit → rotary field wrong
2	Yellow control lamp	Lights up if the direction of rotation is wrong. → Change direction of rotation

Figure 50: Fault displays



5.14.4 Table of faults

Fault	Possible cause	Troubleshooting	Rectification by
Machine does not start water	Water pressure too low	Check the water supply, clean the strainer screen, connect booster pump upstream if necessary	Operator
Machine does not start current	Power supply not in order	Repair power supply	Service technician
	Pushbutton for control voltage "ON" is not pressed	Press pushbutton for control voltage "ON"	Operator
	On/off switch not switched on	Switch on the on/off switch	Operator
	RCD was triggered	Reset RCD	Service technician
Machine does not start material	Excessively thickened material in mixing tube	Empty the mixing tube and start again	Operator
	Excessively dry material in mixing tube	Empty the machine and start again	Operator
Water is not flowing	Solenoid valve (hole in membrane blocked)	Clean solenoid valve	Service technician
	Solenoid coil defective	Change solenoid coil	Service technician
	Water inlet at mixing tube blocked	Clean water inlet at mixing tube	Operator
	Needle valve closed	Open needle valve	Operator
	Cable to solenoid valve defective	Replace cable to solenoid valve	Service technician
Mixing motor does not start	Mixing motor defective	Replace the mixing motor	Service technician
	Connection cable defective	Change connection cable	Service technician
Machine stops after a short while	Water inlet screen contaminated	Clean or replace filter	Operator
	Hose connection or water supply line too small	Enlarge hose connection or water supply line	Operator
	Water inlet pipe too long or inlet pressure too low	Connect an additional booster pump upstream if necessary	Service technician
Mortar flow "thick-thin"	Too little water	Increase the water quantity by 10% for approx. ½ minute and then turn down slowly	Operator
	Mixing shaft defective; no original PFT agitator	Replace the mixing shaft with original PFT agitator	Operator
	Pressure reducer set incorrectly or defective	Adjust or replace pressure reducer	Service technician
Mortar flow ceases	Poor mixing in mixing tube	Add more water	Operator
	Material is clumped and narrows the water inlet	Remove the material and clean the water inlet	Operator

Operation

Fault	Possible cause	Troubleshooting	Rectification by
	Material in material hopper has become wet	Remove the wet material and dry the material hopper	Operator
	Mixing shaft defective	Replace the mixing shaft	Operator



6 Maintenance

6.1 Safety

Personnel

- The maintenance works described here can be carried out by the operator, unless marked otherwise.
- Some maintenance work must only be carried out by specially trained technical personnel or exclusively by the manufacturer.
- Work on electrical systems must always only be carried out by qualified electricians.

Basic information

WARNING



Risk of injury due to improperly carried out maintenance work!

Improper maintenance can lead to severe injuries or considerable property damage.

- Prior to starting the works ensure that there is enough space to carry out the works.
- Ensure order and safety at the assembly site! Unattached components or tools left lying around or stacked on one another can cause accidents.
- If components have been previously removed, ensure that they are mounted again correctly, reattach all fastening elements and adhere to the specified screw tightening torques.

Electrical system

DANGER



Danger to life from electric current!

Contact with live components can lead to death or serious injury. Live electrical components can move uncontrollably and cause serious injury.

- Switch off the energy supply before starting any work and secure against restarting.

6.1.1 Remove connection cable

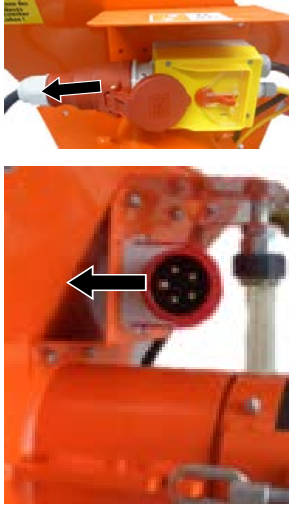


Figure 51: Remove connection cable

Electrical system

⚠ WARNING



Danger to life from electric current!

There is danger to life if you come in contact with live parts. Activated electrical components can carry out uncontrolled movements and cause serious injuries.

Therefore:

- Switch off the energy supply before starting any work and secure against restarting.
- Disconnect the power supply by removing the connection cable.

Secure against restarting

⚠ WARNING



Danger to life from unauthorised restarting!

When working with the tool, there is the risk that the energy supply is switched on without authorisation. This poses a danger to life for the persons in danger area.

Therefore:

- Switch off all power supplies before starting any work and secure against restarting.

6.2 Environmental protection

Environmental protection

Observe the following notes on environmental protection when carrying out maintenance works:

- Remove the discharged, exhausted or surplus grease at all greasing points that are lubricated manually and dispose of in accordance with the local applicable regulations.
- Collect used oil in suitable containers and dispose of it according to the applicable local regulations.

6.3 Maintenance plan

The following paragraphs describe the maintenance works required for an optimal and trouble-free operation.

In the event that increased wear is detected during regular checks, the required maintenance intervals have to be shortened according to the actual signs of wear.

Should you have any queries regarding maintenance works and intervals contact the manufacturer, see back page for service address.



The maintenance is limited to a few checks.

Thorough cleaning after use is the most important maintenance.

Interval	Maintenance work	To be carried out by
Daily	Clean/replace the strainer screen in the water inlet.	Operator
Monthly	Clean/replace the strainer screen in the pressure reducer.	Service technician

6.4 Maintenance work

In the event that increased wear is detected during regular checks, the required maintenance intervals have to be shortened according to the actual signs of wear.

Should you have any queries regarding maintenance works and intervals contact the manufacturer, see back page for service address.

6.4.1 Implementation by a service technician



A service technician is responsible for the assembly and commissioning of machines. In addition, service technicians carry out maintenance and repair work. If work is required on the control box or on other electrical parts, the service technician must have completed vocational training as an electrician.

Maintenance



6.4.2 Strainer screen in the water inlet



Figure 52: Strainer screen in the water inlet

Implementation by operator.

1. Remove the strainer screen (1) from Geka coupling.
2. Clean the strainer screen (daily).
3. Replace the screen if dirt is severe.
4. Reinsert the strainer screen.

Strainer screen for Geka coupling:

- Item no. 20152000

6.4.3 Strainer screen in pressure reducer

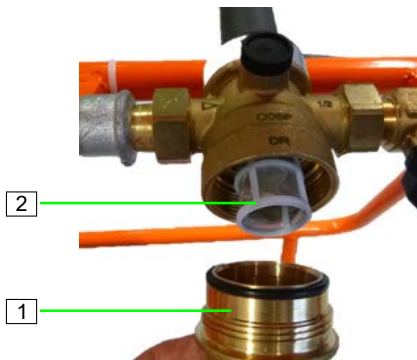


Figure 53: Strainer screen in pressure reducer

Implementation by a service technician

1. Remove the closure cap (1) from the pressure reducer.
2. Take out the strainer screen (2) and clean (monthly).
3. Replace the strainer screen if dirt is severe.
4. Insert strainer screen and screw on the closure cap.

Screen for pressure reducer:

- Item no. 20156000

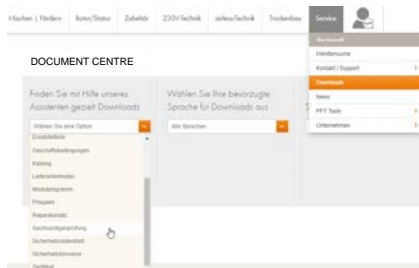
6.5 Actions after completed maintenance

After finishing the maintenance works and prior to switching on the machine, the following steps have to be carried out:

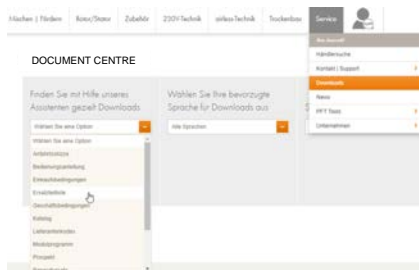
1. Check all previously loosened screw connections for secure fit.
2. Check if all previously removed safety systems and covers are properly reinstalled.
3. Ensure that all tools, materials and other equipment used have been removed from the work area.
4. Clean the work area and remove any spilled materials such as liquids, processing material or similar.
5. Ensure that all safety systems of the installation work perfectly.

6.6 Periodic inspection/expert inspection

- Construction machinery has to be inspected for safe working condition in accordance with the operating conditions and the operational requirements as needed, however at least once a year by an expert.
- Pressure vessels have to undergo the prescribed expert inspections.
- The inspection results have to be documented and kept at least until the next inspection.
- The documents for the expert inspection can be found on the internet at www.pft.net.
- Open the Document Centre under Service → Downloads.
- In this area, select the expert inspection category to access all relevant inspection documents.



6.7 Spare parts lists



The spare parts lists for the machine can be found on the Internet at www.pft.net.

- Open the Document Centre under Service → Downloads.
- In this area, select the spare parts list category.
- In addition, select the machine you are looking for.

6.7.1 Accessories



Recommended accessories/equipment can be found in the PFT machine and equipment catalogue or under www.pft.net

Disassembly



7 Disassembly

After the useful service life has been reached, the device has to be dismantled and disposed of in an environment-friendly manner.

7.1 Safety

Personnel

- Disassembly must be carried out by specially trained technical personnel only.
- Work on the electrical system must be carried out by qualified electricians only.

Basic information

WARNING



Risk of injury in case of improper disassembly!

Stored residual energies, sharp components, points or edges at and inside the device or on the required tools might cause injuries.

Therefore:

- Prior to starting the works ensure that there is sufficient space.
- Carefully handle components with sharp edges.
- Ensure order and cleanliness at the working place! Loose components and tools on top of one another or lying about pose potential accident risks.
- Dismantle components correctly. Pay attention to partly high dead weight of the components. If required, use lifting equipment.
- Secure components that they do not fall down or topple over.
- In case of doubt, consult the dealer.

Electrical system

DANGER



Danger to life from electric current!

Contact with live components can lead to death or serious injury. Activated electrical components can carry out uncontrolled movements and cause serious injuries.

Therefore:

- Prior to beginning the disassembly, switch off the power supply and fully disconnect it.



7.2 Disassembly

When decommissioning, clean the device and dismantle it according to the applicable work safety and environmental protection regulations.

Prior to starting the disassembly:

- Switch off device and secure against restarting.
- Disconnect the entire energy supply from the machine and discharge the residual energy.
- Remove operating and auxiliary materials as well as residual processing materials and dispose of them in an environmentally sound manner.

Disposal



8 Disposal

Provided no return or disposal agreements have been made, recycle the disassembled parts:

- Scrap metals.
- Recycle plastic elements.
- Dispose of remaining components, sorted according to the type of material.

NOTE



Environmental damage due to incorrect disposal!

- Electrical scrap and components, lubricants and other process materials are subject to special guidelines and may only be disposed of by approved waste disposal specialists!



Local authorities and waste disposal specialists can provide more details on the correct disposal of materials.



Disposal





PFT - ALWAYS AT YOUR SITE



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