

# Operating manual

## PFT continuous mixer HM 2002

### Overview - Operation - Spare parts lists



Article number of the operating manual: 20 09 98 59

HM 2002 article number 20 54 60 03

HM 2002 with rubber mixing tube article number 00 02 04 73

HM 2002 rubber mixing tube 2.2 KW 120 V 60 Hz 1 Phase article number 00 59 33 59



**Read the operating manual prior to starting any work!**

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# 1 EC Declaration of Conformity

**Company:** Knauf PFT GmbH & Co. KG  
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 97346 Iphofen  
 Germany

declares under our sole responsibility that the product:

**Type of machine:** HM 2002  
**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),
- Machine 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.-Wirtsch.-Ing. (FH) 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, \_\_\_\_\_

Place, Date of issue

Name and signature

Dr. York Falkenberg

Managing Director  
 Identification of the signatory

## 2 Examination

### 2.1 Examination 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.

### 2.2 Periodic inspection

- Construction machinery has to be inspected for their 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.

## 3 General information

### 3.1 Information regarding the operating manual

This operating manual gives important information on handling the device. 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 tool and easily accessible to the staff at all times.

If the tool 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.



## 3.2 Keep the manual for future reference

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

## 3.3 Division

The operating manual is divided into 2 books:

■ Part 1 Safety

General safety instructions about HM

Article number: 00 14 63 78

■ Part 2 Overview, operation, service and spare parts lists (this volume).

For safe operation of the device both parts have to be read and observed. Together they form one operating manual.

# 4 Technical data

## 4.1 General information

### Dimensions

Detail	Value	Unit
Weight: Art. No. 20 54 60 03	125	kg
Weight: Art. no. 00 02 04 73	118	kg
Weight: Art. no. 00 59 33 59	120	kg
Length	1870	mm
Width	575	mm
Height	1005	mm
Outlet height	560	mm

### Hopper dimensions

Detail	Value	Unit
Container volume approx.	110	litres

### Performance data

Detail	Value	Unit
Mixing performance approx.*	24 - 30	l/min
Grain size max.	4	mm

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

**Technical data****4.2 Connection value of water**

1

Detail	Value	Unit
Operating pressure, min.	2.5	bar
Connection (1)	1/2	inch

Fig. 1: Water connection

**4.3 Power connection values 230 V 50 Hz****Electric 230 V 50 Hz**

Detail	Value	Unit
Voltage, 1 Ph. 50 Hz	230	V
Power consumption, max.	14.5	A
Speed of mixing shaft	280	rpm
AC current 230 V / 50 Hz, 16 A supply 3 x 2.5 mm <sup>2</sup> only to site main cabinet with specified RCCB 30 mA	16	A
Fuse protection, at least	16 A type B	

**4.4 Power connection values 230 V 60 Hz****Electric 230 V 60 Hz**

Detail	Value	Unit
Voltage, 1 Ph. 60 Hz	230	V
Power consumption, max.	13	A
Speed of mixing shaft	325	rpm
CEE connection, 3-pin (2P/PE) supply 3 x 2.5 mm <sup>2</sup> only to site main cabinet with specified RCCB 30 mA	16	A
Fuse protection, at least	16 A type B	



## Sound power level

### 4.5 Power connection values 120 V 60 Hz

#### Electrics 120 V 60 Hz

Detail	Value	Unit
Voltage, 1 Ph. 60 Hz	120	V
Power consumption, max.	25	A
Speed of mixing shaft	325	rpm
CEE connection, 3-pin (2P/PE) supply 3 x 4 mm <sup>2</sup> only to site main cabinet with specified RCCB 30 mA	32	A
Fuse protection, at least	32A type C	

### 4.6 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

## 5 Sound power level

Guaranteed sound power level LWA	78 dB (A)
----------------------------------	-----------

## 6 Vibrations

Weighted effective value of acceleration to which the upper body parts are exposed <2.5 m/s<sup>2</sup>

## Dimension sheet HM 2002



## 7 Dimension sheet HM 2002

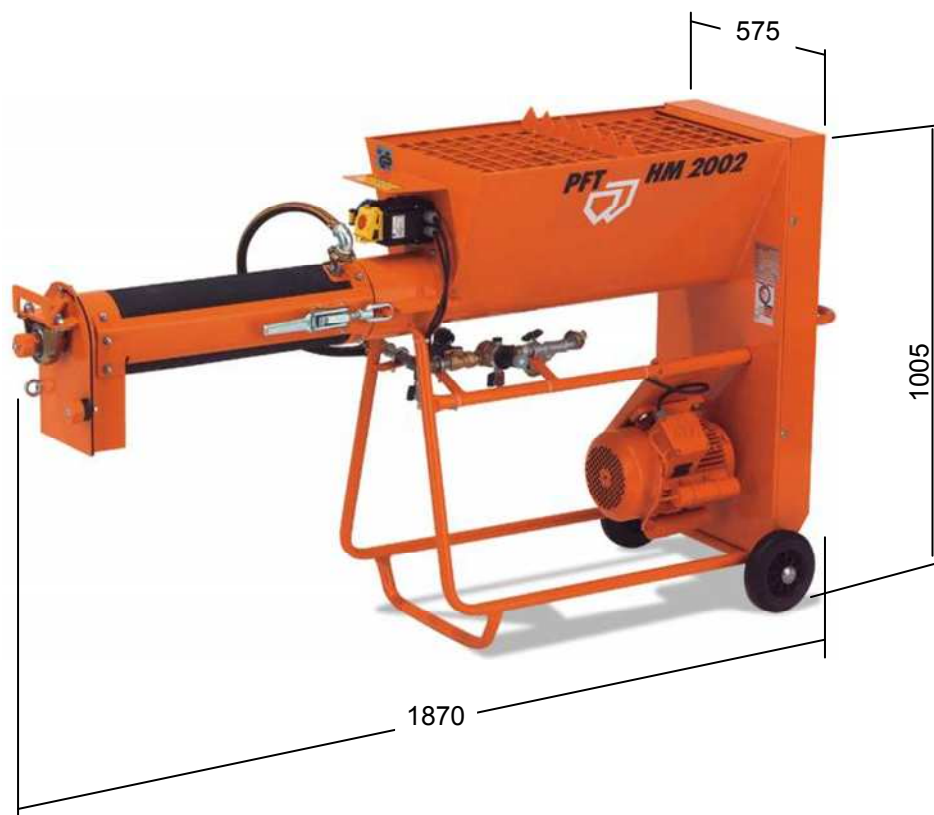


Fig. 2: Dimension sheet

## 8 Name plate



Fig. 3: Name plate

The type plate is located on the front side of the material container on the motor side and includes the following information:

- Manufacturer
- Type
- Year of manufacture
- Machine number

## 9 Quality Control sticker



Fig. 4: 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



## 10 Structure of HM 2002

### 10.1 Overview of HM 2002

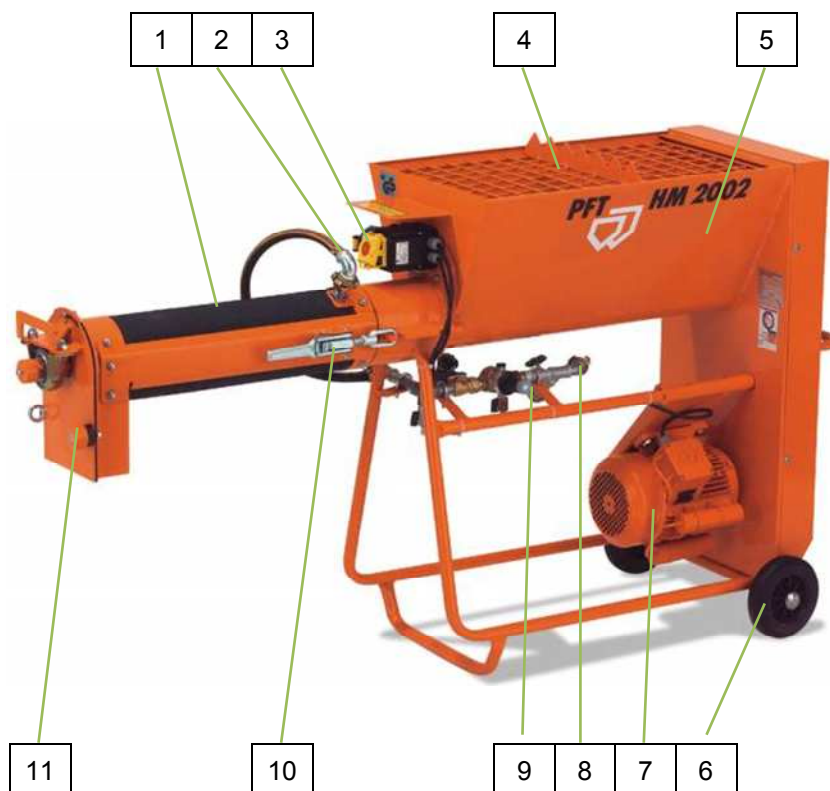


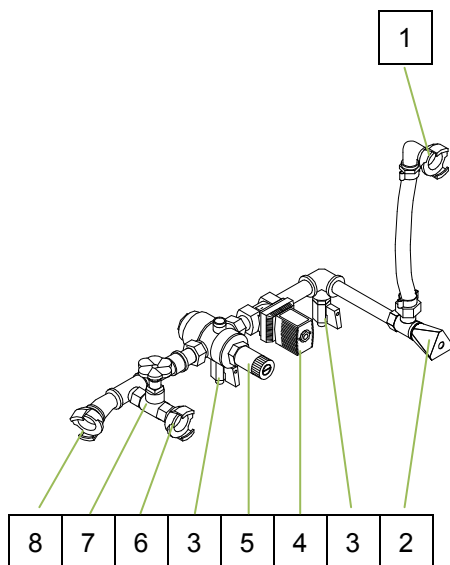
Fig.5: Overview of HM 2002

- |                                       |  |
|---------------------------------------|--|
| 1. Rubber mixing tube                 | 7. Mixing motor                                    |
| 2. Water to mixing tube               | 8. Water inlet, water connection from water supply |
| 3. ON / OFF switch                    | 9. Water fitting                                   |
| 4. Protective grille with sack opener | 10. Quick closure at mixing tube                   |
| 5. Material container with frame      | 11. Mortar outlet                                  |
| 6. Wheel                              |  |

## Structure of HM 2002



### 10.2 Water fitting



1. Water connection to mixing tube.
2. Needle valve to adjust the water quantity.
3. Water drain valve (in case of risk of frost).
4. Solenoid valve.
5. Pressure reducer.
6. Water extraction.
7. Water extraction valve.
8. Water inlet from water supply or water pump.

Fig. 6: Water fitting

### 10.3 Retrofit kit for water flow meter 100 - 1,000 l/h for HM 2002

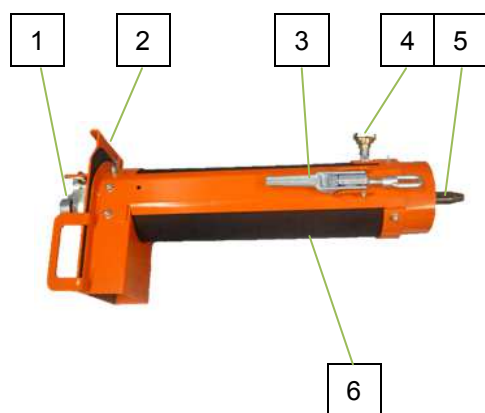


1. Water connection to mixing tube.
2. Needle valve to adjust the water quantity.
3. Attachment to material container.
4. Water flow meter 100-1000 l/h.
5. Connection to angular distributor with ball valve.

Fig. 7: Retrofit kit for water flow meter



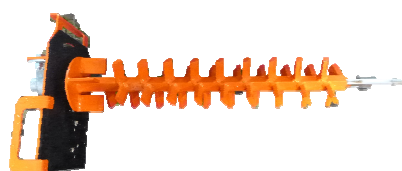
## 10.4 Rubber mixing tube art.no. 00012594



1. Square external bearing.
2. Removable star plate for mortar outlet flange.
3. Quick closure.
4. Water inlet at mixing tube.
5. Mixing shaft.
6. Rubber mixing tube.

Fig. 8: Rubber mixing tube

## 10.5 Mixing shaft



1. Sprocket mixing shaft HM 2002 (4 levels) article number 00431198 without mortar outlet flange.

Fig. 9: Mixing shaft

## 10.6 Dosing shaft



1. Dosing shaft 30 l/min for HM 2002 Article number 20547300

Fig. 10: Dosing shaft

# 11 Connections

## 11.1 Power connection 230 V 50 Hz



1. Alternating current connection (1) 230 V.

Fig. 11: Power connection 230 V

## Connections



### 11.2 Power connection 230 V 60 Hz



1. Alternating current connection (1) 230 V 60 Hz.

*Fig. 12: Power connection 230 V*

### 11.3 Power connection 120 V 60 Hz



1. Alternating current connection (1) 120 V 60 Hz.

*Fig. 13: Power connection 120 V*



## 12 Accessories

Recommended accessory / equipment, PFT machines and device catalogue or under [www.pft.eu](http://www.pft.eu).

Home
News
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<b>Products</b>
Product programme
Pneumatic conveying equipment
Mixing pumps
<b>Horizontal continuous mixers</b>
Batch / Paddle mixers
Conveying pumps
Airless sprayers
Cutting table
Equipment / Tools / Accessories
Material containers
Product search
Rotor / Stator programme
Accessories guide
Other fields of activity
Applications
Information service
Contact PFT worldwide
Business Login
Spare parts service

### Horizontal continuous mixers

continuously and fully automatically mix cement-based ready-mixed dry mortars (e.g. masonry mortars, jointing mortars, levelling compounds, bonding / reinforcing mortars, etc.) into ready-to-use materials. Depending on the model design, these machines can be used either with bagged material only or with bagged and optionally silo material, or only with silo material.

#### PFT HM 2002

##### CONTINUOUS MIXER

Description	Applications	Advantages	Tech. data	Accessories
<b>Part no.</b> 00020473	<b>Description</b> PFT HM 2002 Standard equipment - Dosing shaft 30 l/min - Sprocket mixing shaft HM 24 - rubber mixing tube - Integrated control box with solenoid valve and pressure reducer - Operating instructions			<b>Picture</b> 

##### Required accessories

Part no.	Description	Picture
20423400	Extension cable 3 x 2.5 mm², BLUE 2-16 A - 25 m	
20212100	Water hose Geka/Geka DN19 (3/4") - 40 m	

##### Recommended accessories

Part no.	Description	Picture
00493686	Water pressure booster pump PFT AV 3000, 50 Hz	
20211100	Water/air hose 1/2 ", 5 m with Geka couplings	
20215700	Spraying nozzle 3/4" with Geka coupling	
00001091	Expansion kit water flow meterconsisting of: water flow meter 100 - 1,000 l/h and installation material	
00206710	Cover HM 2002 cpl.	

## Brief description



# 13 Brief description

## 13.1 CONTINUOUS MIXER PFT HM 2002

### CONTINUOUS MIXER

#### PFT HM 2002

The compact bagged goods mixer PFT HM 2002 for alternating current with high performance.

quickly operational, reliable, easy to use

Thanks to the rubber mixing tube, there is hardly any caking and the mixer is almost self-cleaning.



# 14 Material:

## 14.1 Fields of application

### CONTINUOUS MIXER

#### PFT HM 2002

Mixes all bagged premixed dry mortars fully automatically with a lime and cement base up to a maximum 4 mm grain size such as:

- masonry mortar
- Light masonry mortar
- Adhesive and reinforcement mortar
- Flow and joint mortar
- cement plasters
- Finishing plaster
- Grater plaster
- insulation plasters
- Levelling compounds

etc.





## 14.2 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



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



## 15 Safety rules



### Caution!

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

## 16 Transport, packing and storage

### 16.1 Safety instructions for transport

#### Improper transport



#### **ATTENTION!**

##### **Damage from improper transport!**

Improper transport may cause substantial property damage.

- 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 fix to projecting machine parts or eyelets of attached components.
- Ensure safe fit of the sling gear.
- Use only approved lifting gear and sling gear with sufficient lifting capacity.



### 16.2 Transport inspection

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

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

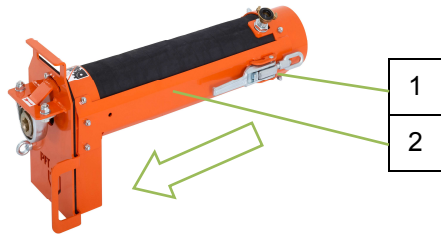
- Do not accept the delivery or under reserve only.
- Note the extent of damage on the transport documentation or on the delivery note of the carrier.



**NOTE!**

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

### 16.3 Transport in individual parts



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

1. Release quick-release fasteners (1) and remove the mixing tube (2) from the front.

Fig. 14: Transport

### 16.4 Transport of machine in operation

Carry out the following steps before beginning the transport:

1. First unplug the mains cable.
2. Remove water supply line.
3. Start transport.

## Packaging



# 17 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.



#### ATTENTION!

##### Environmental damage due to wrong disposal!

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

Therefore:

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

# 18 Operation

## 18.1 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



#### NOTE!

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



## Preparing the machine

### 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 covers and protection devices are installed and work as intended.
- Never deactivate protection 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.

## 19 Preparing the machine



Fig. 15: Grille cover



Fig. 16: Set-up

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



#### **DANGER!**

##### **Rotating dosing shaft!**

Risk of injury when reaching into the material container.

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

- The operating elements have to be freely accessible.
- Put up the machine on a stable, even surface and secure against unwanted movements:
- Neither tilt nor roll off the machine.
- Put up the machine in such a way that it cannot be hit by falling objects.

## Connecting the power supply

## 20 Connecting the power supply

### 20.1 Power connection 230 V 50 Hz

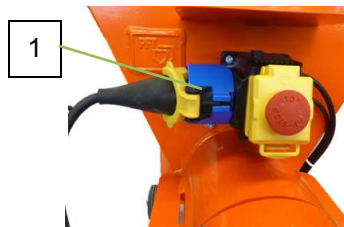
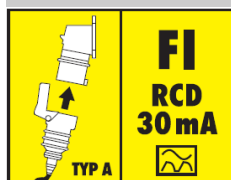


Fig. 17: Power connection

1. Connect the machine (1) only to a 230 V AC network.



#### **DANGER!**

#### **Danger of death from electric current!**

The connection line has to be fused properly:

Connect the machine only to a power source with permissible RCCB (30 mA) RCD (residual current operated device) type A.

### 20.2 Power connection 230 V 60 Hz

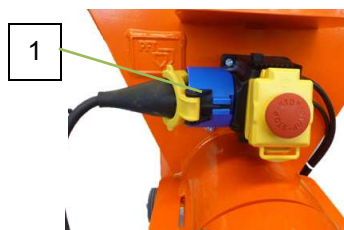
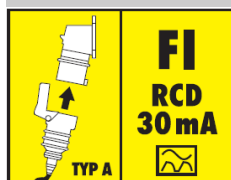


Fig. 18: Power connection

1. Connect the machine (1) only to a 230 V AC network.



#### **DANGER!**

#### **Danger of death from electric current!**

The connection line has to be fused properly:

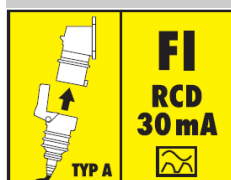
Connect the machine only to a power source with permissible RCCB (30 mA) RCD (residual current operated device) type A.

### 20.3 Power connection 120 V 60 Hz



Fig. 19: Power connection

1. Connect the machine (1) only to a 120 V AC network.



#### **DANGER!**

#### **Danger of death from electric current!**

The connection line has to be fused properly:

Connect the machine only to a power source with permissible RCCB (30 mA) RCD (residual current operated device) type A.

### 20.4 Danger to life from rotating parts



#### **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 cabinet of the machine.
- Using other or external power sources is forbidden for safety reasons.



## 21 Connecting the water supply

### 21.1 Clean the strainer screen

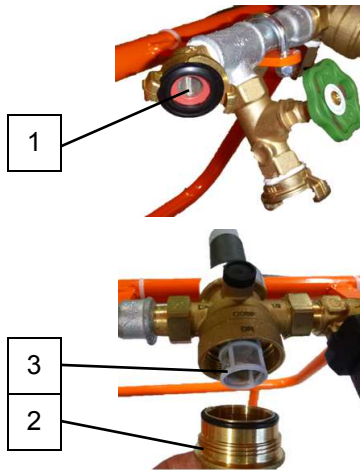


Fig. 20: Water inlet screen

1. Check whether the strainer screen in the water inlet (1) is clean.
2. If necessary, remove the strainer screen from the water inlet and clean it.

Strainer screen with Geka coupling:

Article number 20152000

3. Remove the brass screen cup (2) from the pressure reducer.
4. Check whether the strainer screen in the pressure reducer (3) is clean.

Screen for pressure reducer: Article number 20156000

5. Screw the brass cup (2) back.

### 21.2 Connecting the water hose

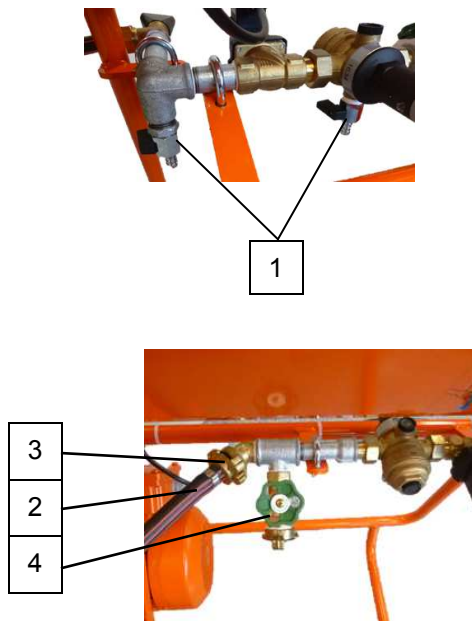


Fig. 21: Connecting the water hose

1. Close the water drain valves (1).
2. Clean and vent the water hose (2) of the water supply network and connect it to the water inlet (3).
3. Open the water tap from the water supply line.
4. Open the water extraction valve (4).
5. 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.

## Setting water factor



### 21.3 Water from water tank



Fig. 22: Booster pump



Fig. 23: Suction strainer complete with filter screen

Booster pump AV 3000, 230 V, 1 Ph, 50 Hz, 0.6 kW complete article number 00493686

The connected booster pump ensures the required water pressure of at least 2.5 bar.

#### NOTE!



*When working from the water tank, the strainer with filter screen (article number 00136619) has to be positioned upstream (bleed booster pump).*

## 22 Setting water factor

### 22.1 Pre-setting the water flow rate



Fig. 24: Needle valve

Adjust the expected amount of water at the needle valve (1):

1. Close the needle valve.
2. Then open the needle valve by two turns.
3. In this position, the water flow rate is approx. 200 ltr/h.
4. Using the needle valve, the material consistency can be adjusted.



#### 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.*



#### NOTE!

*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.*



## 22.2 Connect the water hose to the mixing tube

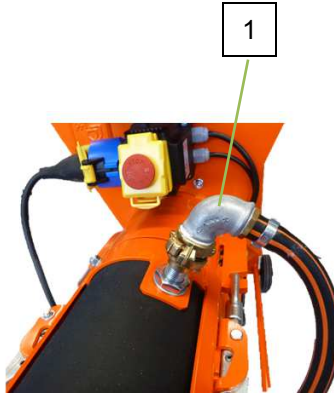


Fig. 25: Connecting the water hose

1. Connect the water hose to the mixing tube.

## 23 Hazardous dusts



Fig. 26: Dust protection



### **Warning!** **Health hazard caused by dust!**

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



### **NOTE!**

*The machine operator or the person working in the dusty area always have 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).*

## 24 Feeding dry material to the machine



Fig. 27: Fill the material container

1. Fill the bagged material into the material container.



### **DANGER!** **Risk of injury at the sack opener!**

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

- Wear safety gloves.

## Putting the machine into operation



## 25 Putting the machine into operation

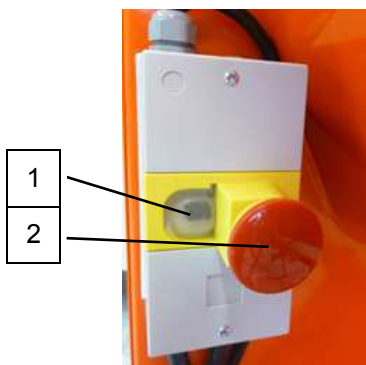
### 25.1 Switching on the machine at 230 V



1. Switch on the machine using the green switch.

Fig. 28: Switching on at 230 V

### 25.2 Switching on the machine at 120 V



1. Switch on the machine using the black switch (1).

2. EMERGENCY STOP button (2).

Turn the button to the right (in the direction of the arrow) to loosen the button.

The machine is switched off in this pressed state.

Fig. 29: Switching on at 120 V

### 25.3 Check consistency of material



1. Check the consistency of material at the mortar outlet.

Fig. 30: Material consistency

## 26 Monitoring the machine



**DANGER!**

**Access by unauthorised persons!**

The machine must be operated only if monitored.



## 27 Apply mortar



### **DANGER!** **Risk 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.

## 28 Interruption of work



### **NOTE!**

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

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

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

## 29 Switching off the machine

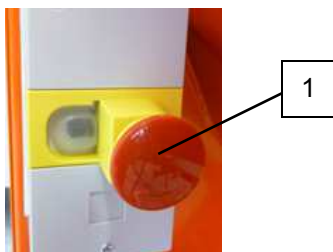
### 29.1 Switching off HM 2002 230 V



1. Switch off the machine using the red switch.

Fig. 31: Switching off at 230 V

### 29.2 Switching off HM 2002 120 V



#### **EMERGENCY STOP button:**

1. Switch the machine off by pressing the red push button (1).
2. The machine is switched off in this pressed state.



### **NOTE!**

*Turn the button to the right (in the direction of the arrow) to loosen the button.*

Fig. 32: Switching off at 120 V

## Stopping in case of an emergency

### 30 Stopping in case of an emergency

#### 30.1 Emergency-stop switch

##### Stopping in case of an emergency

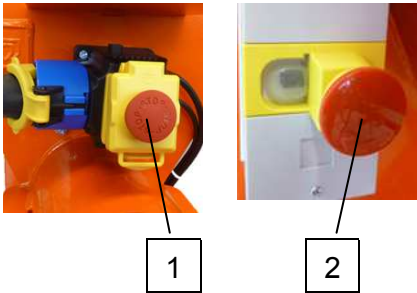


Fig. 33: Stopping

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

In case of danger proceed as follows:

1. Switch off the machine by pressing the red push button (1).
2. Switch off the machine by pressing the red push button (2).
3. Disconnect power supply.
4. Inform responsible person at the operational site.
5. If necessary, call for medical assistance and a fire brigade.
6. Recover persons from the danger zone, initiate First Aid measures.
7. Keep access routes free for emergency vehicles.

##### After the rescue operations

8. If the severity of the emergency permits inform the competent authorities.
9. 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.

- Before reactivation ensure that there are no persons in the danger zone anymore.

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

### 31 Action in case of power cut

#### 31.1 Disconnect power supply.



Fig. 34: Disconnect power supply.

1. Disconnect power supply.
2. Let qualified staff check the power supply.



#### **NOTE!**

*The machine is equipped with a restart interlock. The machine must be restarted after power failure.*



## 32 Work on troubleshooting

### 32.1 Reaction in the event of faults

The following strictly applies:

1. In the event of faults presenting immediate danger to persons or property, activate the emergency OFF function immediately.
2. Determine cause for 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.



**NOTE!**

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

### 32.2 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.

In the event of faults that cannot be rectified by means of the following notes, kindly contact the dealer.

### 32.3 Safety

#### Personal protective equipment

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

- Protective clothing.
- Protective goggles, protective gloves, safety shoes, ear protection.

## Work on troubleshooting



### 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 the electrical system must, in principle, be carried out only by electricians.

## 32.4 Table of faults

Fault	Possible cause	Solution	Rectification by
Machine does not start <b>Current</b>	Power supply not in order	Repair power supply	Service engineer
	“On” switch not pressed	Press the switch	Operator
	RCCB was triggered	Reset RCCB	Service engineer
Machine does not start <b>Material</b>	Excessively thickened material in mixing tube	Empty the mixing tube and start again	Operator
	Excessively dry material in mixing tube	Empty the mixing tube and start again	Operator
Water is not flowing	Solenoid valve (hole in membrane blocked)	Clean solenoid valve	Service engineer
	Solenoid coil defective	Change solenoid coil	Service engineer
	Water inlet on the middle body blocked	Clean the water inlet on the middle body	Operator
	Needle valve closed	Open needle valve	Operator
	Cable to solenoid valve defective	Replace cable to solenoid valve	Service engineer
Mixing motor does not start	Mixing motor defective	Replace the mixing motor	Service engineer
	Connection cable defective	Change connection cable	Service engineer
Machine stops after a short while	Water inlet screen contaminated	Clean or replace strainer	Operator
	Hose connection or water pipe too small	Increase dimensions of hose connection or water pipe	Operator
	Water inlet pipe too long or inlet pressure too low	if possible, attach an additional booster pump	Service engineer



## Measures to be taken in case of water outage

Mortar flow ceases	Bad mixture in mixing tube	Add more water	Operator
	Material is clumped and narrows the water inlet	Remove the material and clean the water inlet	Operator
	Material in material container has become wet	Remove the wet material and dry the material container	Operator
	Mixing shaft defective	Replace the mixing shaft	Operator
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 engineer

## 33 Measures to be taken in case of water outage



### NOTE!

Water can be supplied to the machine from a container by means of a booster pump (article number 00493686) (see page 24 point 22.3)

## 34 Cleaning

### 34.1 Secure against restarting



#### DANGER!

##### 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.

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

## 35 End of work / clean machine

### 35.1 Empty mixing tube

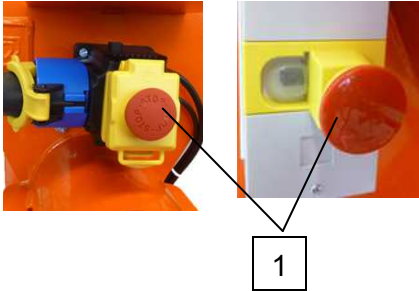


Fig. 35: Switching off



#### **NOTE!**

*In case of a continuous daytime operation, the machine is cleaned only at the end of work.*

The machine has to be cleaned daily after work:

1. Stop filling material into the material container shortly before end of work.
2. As soon as diluted material emerges from the mortar outlet, switch off the machine by pressing the red push button (1).
3. Switch the machine on again and collect the thinned material into a separate container.

### 35.2 Disconnect power connection 230 V

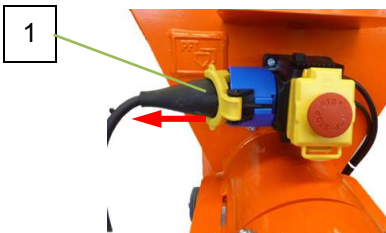


Fig. 36: Power cable

1. Unplug power cable 230 V (1).

### 35.3 Disconnect power connection 120 V



Fig. 37: Power cable

1. Unplug power cable 120 V (1).



### 35.4 Secure against restarting


**DANGER!**
**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.

- Switch off all power supplies before starting any work and secure against restarting.
- If protective covers have been removed for cleaning purposes, they must be properly put back again without fail after completion.

### 35.5 Clean HM 2002

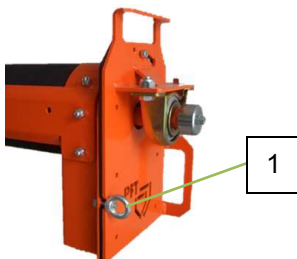

**ATTENTION!**
**Water can enter sensitive machine parts!**

- 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).


**NOTE!**

*Do not direct the water jet on electrical parts such as gear motor or ON/OFF switch.*

### 35.6 Cleaning the mixing shaft



1. Loosen ring nut (1).

Fig. 38: Loosen ring nut

## End of work / clean machine



Fig. 39: Remove the mixing shaft

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

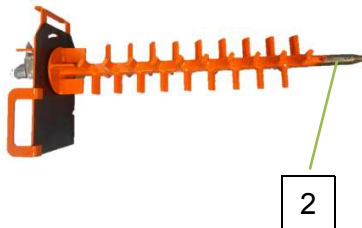


Fig. 40: Cleaning the mixing shaft

3. Slightly lubricate the bearing journal (2) of the mixing shaft after cleaning.

### 35.7 Cleaning the mixing tube

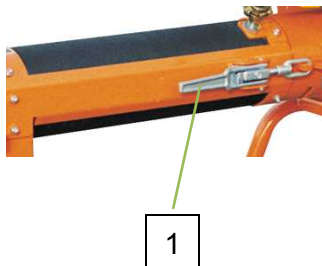


Fig. 41: Cleaning the mixing tube

1. Open the quick closures (1) on both sides of the mixing tube.
2. Remove and clean the rubber mixing tube.

### 35.8 Clean the material container

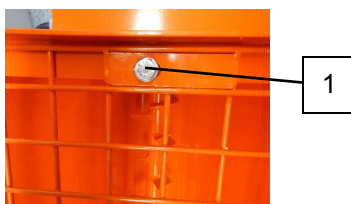


Fig. 42: Clean the material container

1. Clean the material container with water only when it is completely empty.
2. Loosen the screw (1).
3. Remove the protective grille.



### 35.9 Cleaning the dosing shaft

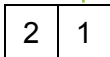


Fig. 43: Cleaning the dosing shaft

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

### 35.10 Setting the mixing shaft

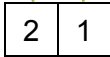


Fig. 44: Setting the mixing shaft

1. Assemble clean and dry parts only.
2. Keep the quick closures at the mixing tube clean.
3. Move the cleaned mixing shaft into the mixing tube and connect with dosing shaft.
4. Fasten the star plate (2) using the ring nut (1).

## 36 Measures in case of risk of frost



### ATTENTION! Damage by frost!

Water that expands inside the machine during frost can cause severe damage.

- The following steps are to be carried out if the machine stands still in case of risk of frost.

## Maintenance



### 36.1 Measures in case of risk of frost

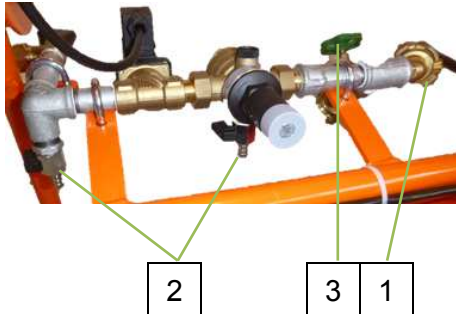


Fig. 45: In case of risk of frost



Fig. 46: Disconnecting the water hose

1. Disconnect the water hose (1) from the water inlet.
2. Open the ball valves (2) and water extraction valve (3).

3. Disconnect the water hose (4) from the water inlet at the mixing tube.

## 37 Maintenance

### 37.1 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 the electrical system must, in principle, be carried out only by 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.

Therefore:

- Ensure order and safety at the assembly site! Loose, stacked components or components lying about can cause accidents.
- If components were removed, ensure proper assembly, put back all fastening elements and observe torque indications for screws.



## 37.2 Remove connection cable

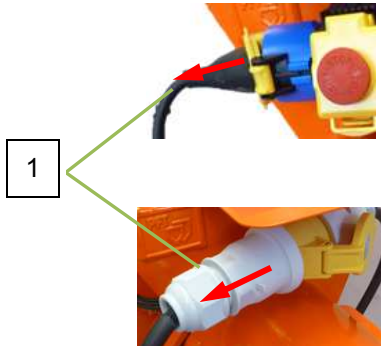


Fig. 47: Disconnect power supply

### Electrical system

### Environmental protection

#### 1. Disconnect power supply



#### **DANGER!** **Danger of death 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 (1).



#### **DANGER!** **Danger of death from electric current!**

There is danger to life if you come in contact with electrical components. 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.

- 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 replaced oil in suitable containers and dispose of in accordance with the local applicable regulations.

## Maintenance work



### 37.3 Maintenance plan

The following paragraphs describe the maintenance works that are required for an ideal 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 page 2 for service addresses.

Interval	Maintenance work	To be carried out by
daily	Clean/replace strainer screen in water inlet.	Operator

## 38 Maintenance work

### 38.1 Strainer screen



Fig. 48: Strainer screen in water inlet.

Check the strainer screen in water inlet daily:

1. Remove the strainer screen (1) from Geka coupling.
2. Clean the strainer screen.
3. Replace the sieve in case of heavy contamination.
4. Reinsert the strainer screen.

Strainer screen with Geka coupling:

Article number 20152000

- Implementation by operator.

#### 38.1.1 Strainer screen in pressure reducer



Fig. 49: Strainer screen in pressure reducer

1. Remove the closure cap (1) from the pressure reducer.
2. Take out the strainer screen (2) and clean (monthly).
3. Replace the screen in case of heavy contamination.
4. Insert screen and screw on the closure cap.

Screen for pressure reducer: Article number 20156000

- Execution by service technician.



### 38.2 Lubrication



Fig. 50: Lubrication

Lubricate the bearings for the dosing shaft at the lubricating nipple (1) once in six months.

- Implementation by operator.

### 38.3 Changing the V-belt

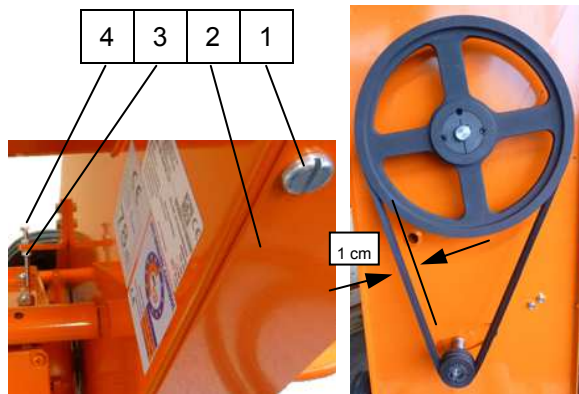


Fig. 51: V-belt

1. Loosen the four screws (1) and remove the cover hood (2).
2. Loosen the counter nuts (3) and screws (4).
3. The V-belt is tensioned by the dead weight of the gear motor.
4. The indentation depth should not be more than one centimetre.

## Disassembly



### 38.4 Actions after completed maintenance

1. After finishing the maintenance works and prior to switching on the machine, the following steps have to be carried out:
2. Check all previously loosened screw connections for secure fit.
3. Check if all previously removed safety systems and covers are properly reinstalled.
4. Ensure that all used tools, materials and other equipment were removed from the work area.
5. Clean the work area and remove any spilled materials such as liquids, processing material or similar.
6. Ensure that all safety systems of the installation work perfectly.

## 39 Disassembly

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

### 39.1 Safety

#### Personnel

- Disassembly must be carried out only by specially trained technical personnel.
- 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 at 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 fall over.
- In case of doubt, consult the dealer.



## Electrical system



### **DANGER!** **Danger of death 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:

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

## 39.2 Disassembly

Clean the device for phasing out and disassemble under observance of applicable health and safety rules as well as environmental regulations.

Prior to starting the disassembly:

- Switch off device and secure against restarting.
- Physically separate the complete energy supply to the device, discharge stored residual power.
- Remove operating supplies as well as remaining processing materials and dispose of in an environment-friendly way.

## 40 Disposal

If no agreement for the recovery or the disposal was made, recycle the disassembled components:

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



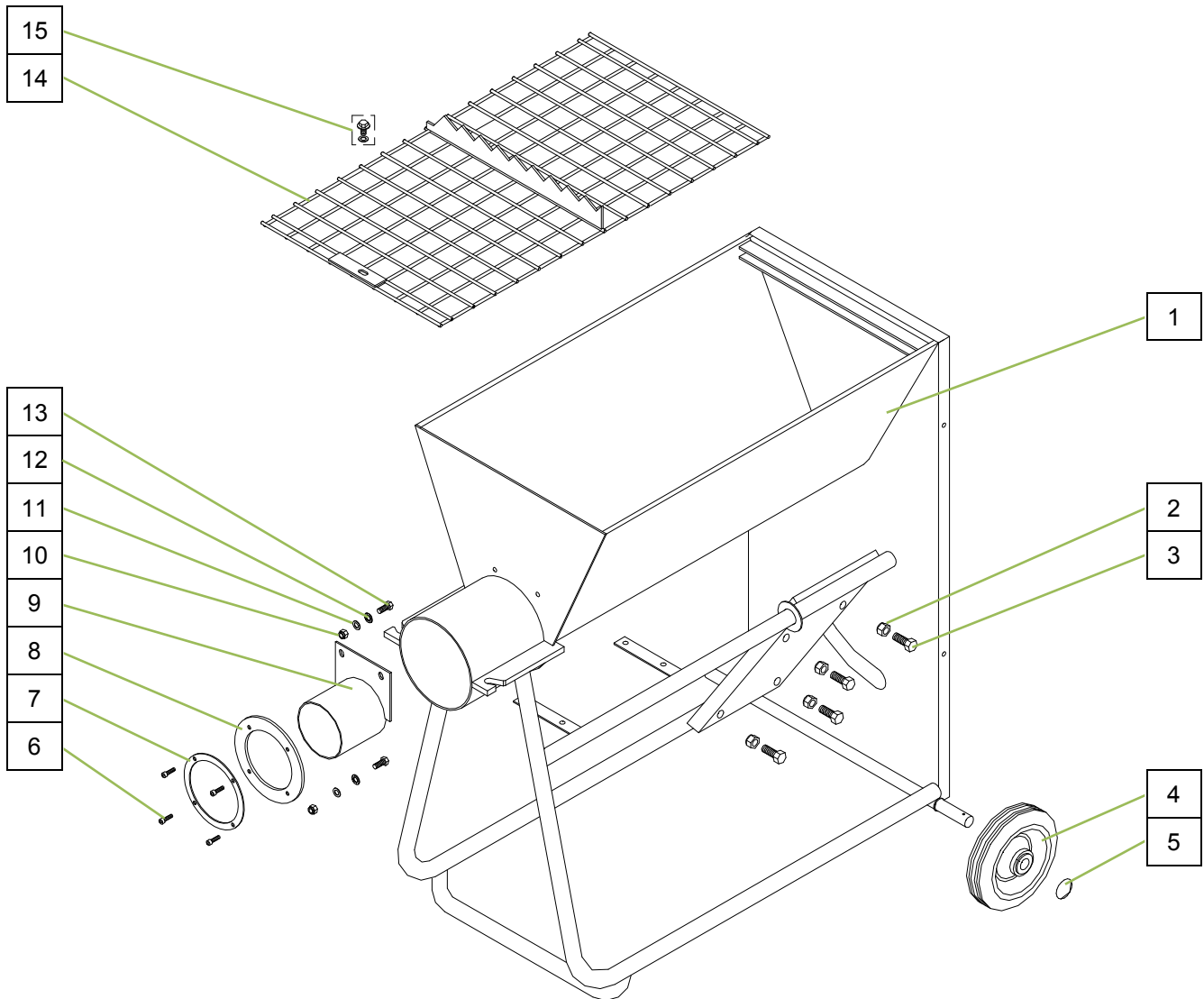
### **ATTENTION!** **Environmental damage in case of incorrect disposal!**

Waste from electronic and electrical equipment, electronic components, lubricants and other auxiliary materials are subject to hazardous waste treatment and must be disposed of by specialised companies only!

The local authority or special waste management operators can supply information on environmentally-friendly disposal.

## 41 ET drawing / ET list of HM 2002

### 41.1 Material container with frame





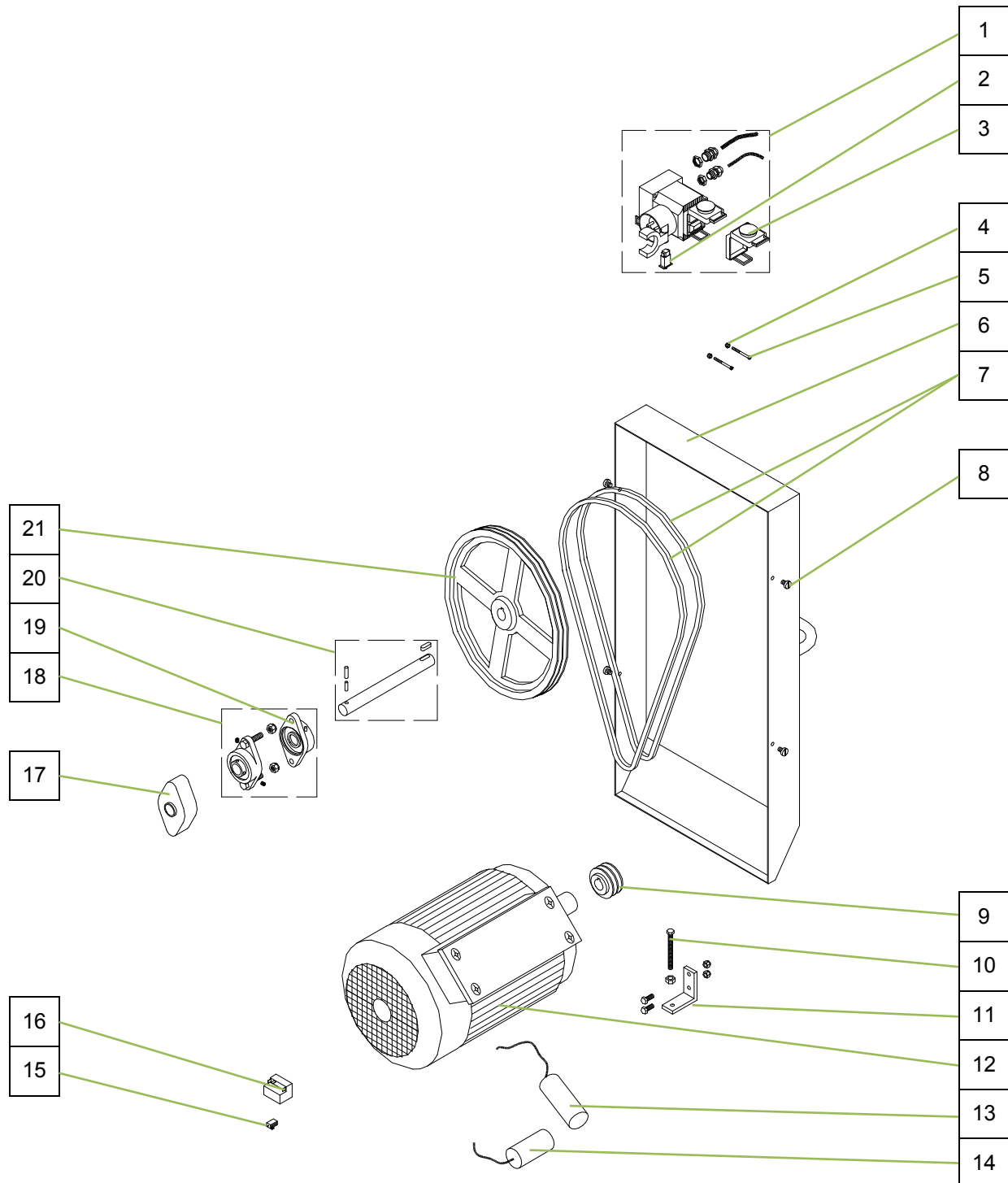
## ET drawing / ET list of HM 2002

ITEM	Qty	Article no.	Article description
1	1	20 54 63 10	Material container HM 2002 with frame RAL 2004
2	4	20 20 89 00	Safety nut M12 galvanised
3	4	20 20 68 01	Hex. screw M12 x 30 galvanised
4	2	20 54 83 10	Wheel 180 x 50 x 90
5	2	20 20 86 03	Quick fastener with cap 20s x N 2 7
6	4	20 20 96 11	Countersunk screw with hexagon socket M4 x 12, galvanised
7	1	20 54 95 15	Clamping flange for mixing tube gasket HM2/200/2002
8	1	20 54 80 10	Rubber gasket D154 x D107 x 5
9	1	20 54 71 03	Dosing wear tube HM 200/2002 D102 x 145
10	2	20 20 72 00	Safety nut M8 galvanised
11	2	20 20 93 13	Washer B 8.4, galvanised
12	2	20 20 93 14	Serrated washer A 8.4, galvanised
13	2	20 20 61 00	Hex. screw M8 x 20 galvanised
14	1	20 54 62 00	Protective grille of HM 2000/2002 RAL 2004
15	1	00 21 45 19	Retainer washer and hex. screw M8x25 complete with groove

## ET drawing / ET list of HM 2002



### 41.2 Gear motor





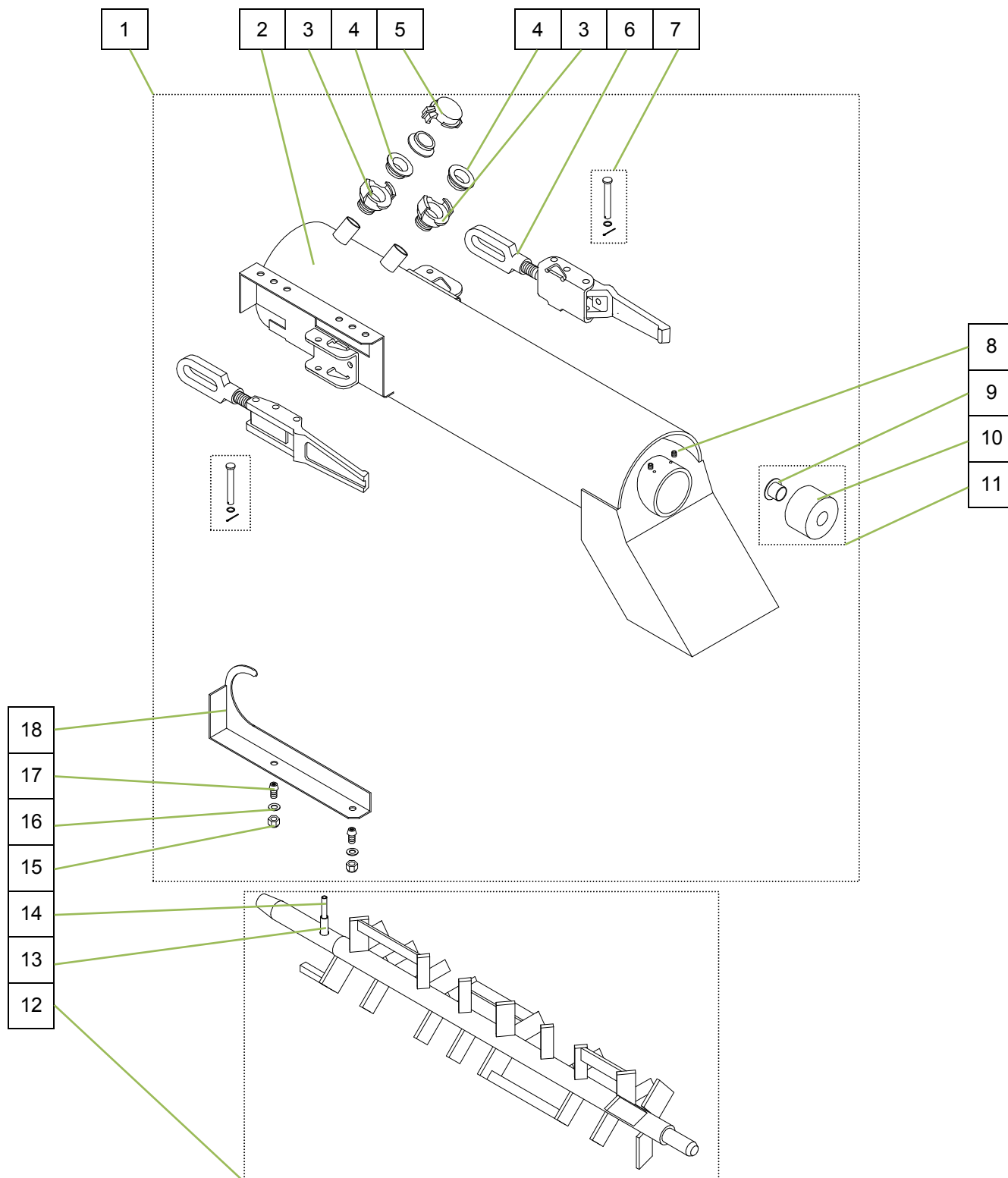
## ET drawing / ET list of HM 2002

ITEM	Qty	Article no.	Article description
1	1	00 00 21 28	On/Off switch of HM 22/2002, 230 V 50 Hz complete with connection cable and thermal protection 14 A
2	1	20 45 69 42	Thermo switch 10-12 A 230 V 50 Hz
3	1	00 05 44 88	Emergency stop button cover (yellow/red complete with screws) for On-Off switch of HM 22/2002 230 V 1Ph. (art. no. 00002128)
4	2	20 20 66 02	Safety nut M5, galvanised
5	2	20 20 64 06	Cylinder head screw M5 x 50, galvanised
6	1	20 54 63 00	Cover hood of HM 2000/2002 RAL 2004
7	2	20 54 66 00	V-belt
8	4	20 20 78 11	Flat head screw M8 x 12, galvanised
9	1	20 54 65 00	V-belt pulley diameter 63 mm
10	1	20 20 78 03	Hex. screw M8 x 80 galvanised
11	1	20 54 62 10	Motor fixing angle of HM 2002 RAL 2004
12	1	20 14 19 00	Motor 2.2 KW 230 V 50 Hz 1 Phase
	1	00 59 33 73	Motor 2.2 kW 120 V 60 Hz 1 Phase
	1	On request	Motor 2.2 KW 230 V 60 Hz 1 Phase
13	1	On request	Capacitor 130 mF D=46 x 84 (Motor 2.2 KW 230 V 50 Hz 1 Phase)
14	1	00 02 12 00	Capacitor 50 myF D=45 x 116 (Motor 2.2 KW 230 V 50 Hz 1 Phase)
15	1	20 44 81 00	Klixon relay type 2CR4-273 (motor 2.2 KW 230 V 50 Hz 1 Phase)
16	1	20 44 80 00	Resistance 0.68 OHM, 12.5 W (motor 2.2 KW 230 V 50 Hz 1 Phase)
17	1	20 54 77 00	Protective cap for HM 2000/2002
18	1	20 54 67 00	Flange bearing unit complete with pivot ball bearing
19	1	00 03 62 43	Y-flange bearing, type FYTB 25TF
20	1	20 54 74 01	Drive shaft complete with clamping pins and feather keys 245 mm
21	1	20 54 64 00	V-belt pulley diameter 355 mm

## ET drawing / ET list of HM 2002



## 41.3 Mixing tube HM complete, art.no. 00002116





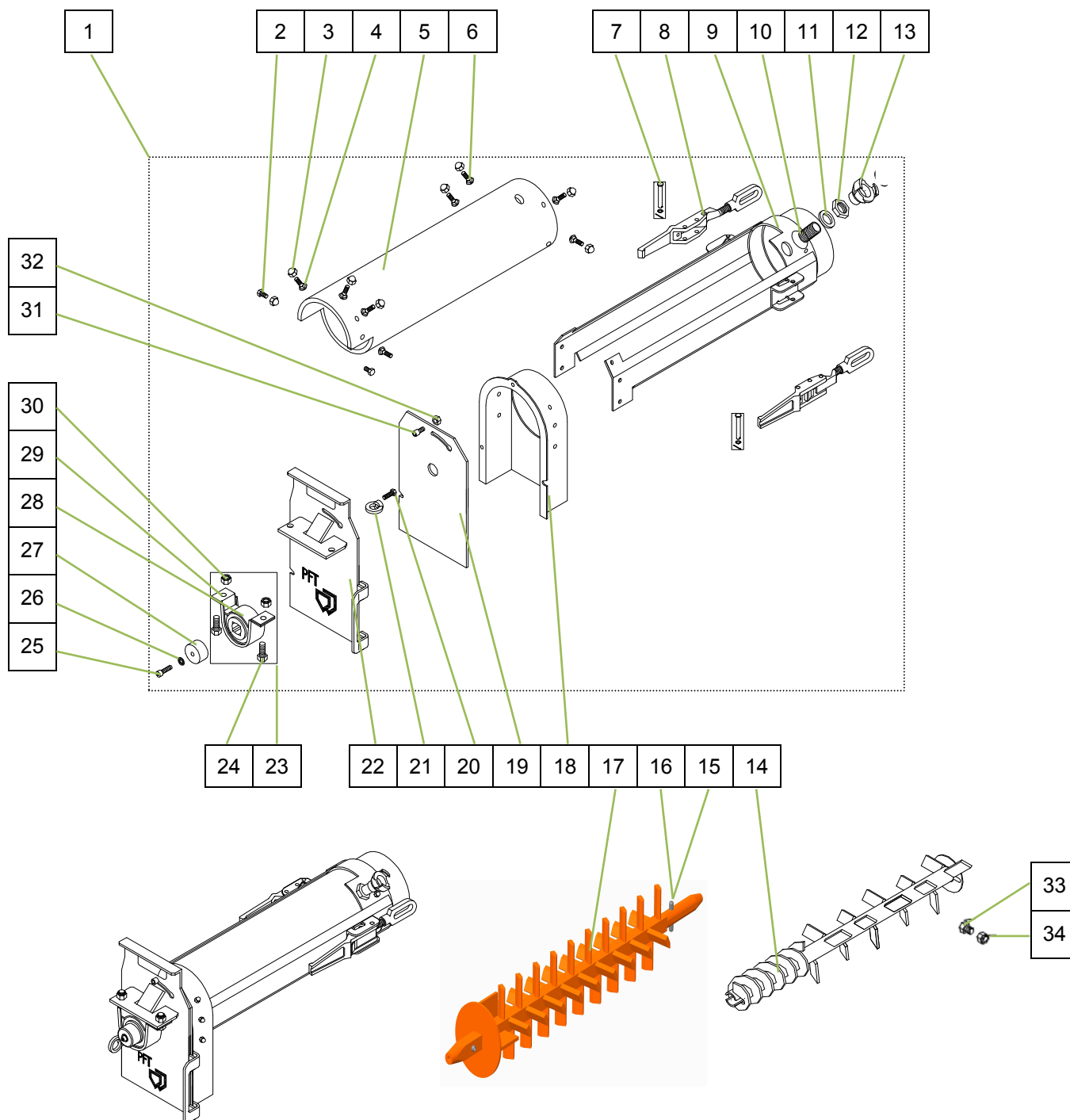
## ET drawing / ET list of HM 2002

ITEM	Qty	Article no.	Article description
1	1	00 00 21 16	Mixing tube HM 22/24 complete
2	1	00 00 21 17	Mixing tube HM 22/24
3	2	20 20 09 00	Geka coupling 1/2" external thread
4	3	20 20 17 00	Gasket Geka coupling (pack.unit=50 pieces)
5	1	20 20 16 50	Geka coupling blind cover
6	2	20 10 08 01	Quick closure with locking device
7	2	20 20 85 22	Splint bolt with washer und splint, galvanised
8	2	20 20 99 92	Threaded pin with hexagon socket M6 x 6, galvanised
9	1	20 02 60 01	Plain bearing flange sleeve
10	1	20 02 60 02	Bearing bush thermoplast D60 x 40
11	1	20 54 82 10	End bearing HM 2/2000/2002 with bearing bush
12	1	00 01 99 67	Mixing shaft HM 2/22/24/2002 with reamer
13	1	20 54 76 00	Clamping pin 10 x 40
14	1	20 54 76 03	Clamping pin 6 x 40
15	2	20 20 72 00	Safety nut M8 galvanised
16	2	20 20 93 13	Washer B 8.4, galvanised
17	2	00 00 86 14	Safety screw, fillister head M 8x16 A2
18	1	00 00 71 52	Safety hooks for CEE plug

## ET drawing / ET list of HM 2002



### 41.4 Mixing tube HM rubber, art.no. 00012594





## ET drawing / ET list of HM 2002

ITEM	Qty	Article no.	Article description
1	1	00 01 25 94	Mixing tube HM 2 with rubber mixing section and rigid mortar outlet flange
2	2	20 20 87 01	Hexagon screw M8 x 16 (VPE 10)
3	10	20 20 66 03	Safety capped nut M8, galvanised
4	4	20 20 63 22	Saucer-head screw M8 x 20, galvanised
5	1	00 01 25 93	Rubber mixing tube HM 104/204 620 mm, notched out
6	4	20 20 63 23	Saucer-head screw M8 x 25, galvanised
7	2	20 20 85 22	Splint bolt with washer und splint, galvanised
8	2	20 10 08 01	Quick release fastener with locking device M14
9	1	00 01 25 91	Flange of rubber mixing tube HM 2 for rigid mortar outlet
10	1	00 00 22 29	Water inlet for rubber mixing tube HM 2
11	1	20 20 93 15	Washer
12	1	00 00 28 11	Tube nut G 1/2"
13	1	20 20 13 00	Geka coupling 1/2" internal thread
14	1	00 00 25 69	Dosing shaft HM 22/24 35l at 280 rpm
15	1	20 54 76 06	Clamping pin 10 x 50
16	1	20 54 76 05	Clamping pin 6 x 50
17	1	00 43 11 98	Sprocket mixing shaft HM 2002 (4 levels) RAL2004
18	1	00 01 25 92	Mortar outlet flange of rubber mixing tube HM 2, rigid
19	1	00 01 94 21	Rubber star plate for mortar outlet flange
20	1	20 20 78 00	Hex. screw M 8 x 30 galvanised
21	1	20 20 79 50	Ring nut M8, galvanised
22	1	00 01 94 20	Star plate for mortar outlet flange
23	1	20 54 55 01	Square external bearing with bearing housing
24	2	20 20 99 63	Hexagon screws M12 x 25 galvanised (pack.unit 10)
25	1	00 02 04 09	Cylinder screw with hexagon socket M8 x 25, galvanised
26	1	20 20 93 14	Serrated washer A 8.4, galvanised
27	1	20 54 54 09	Locking washer HM
28	1	20 54 55 06	Square external bearing
29	1	00 04 13 96	Bearing housing
30	2	20 20 89 00	Safety nut M12 galvanised
31	1	20 20 97 11	Cylinder screw with hexagon socket M8 x 20 galvanised
32	1	20 20 64 00	Hex-nut M 8, galvanised
33	1	20 20 87 02	Hexagonal screw M8 x 10, galvanised
34	1	20 20 72 00	Safety nut M8 galvanised

## ET drawing / ET list of HM 2002



### 41.5 Cable set 120 V 60 Hz art.no. 00593375



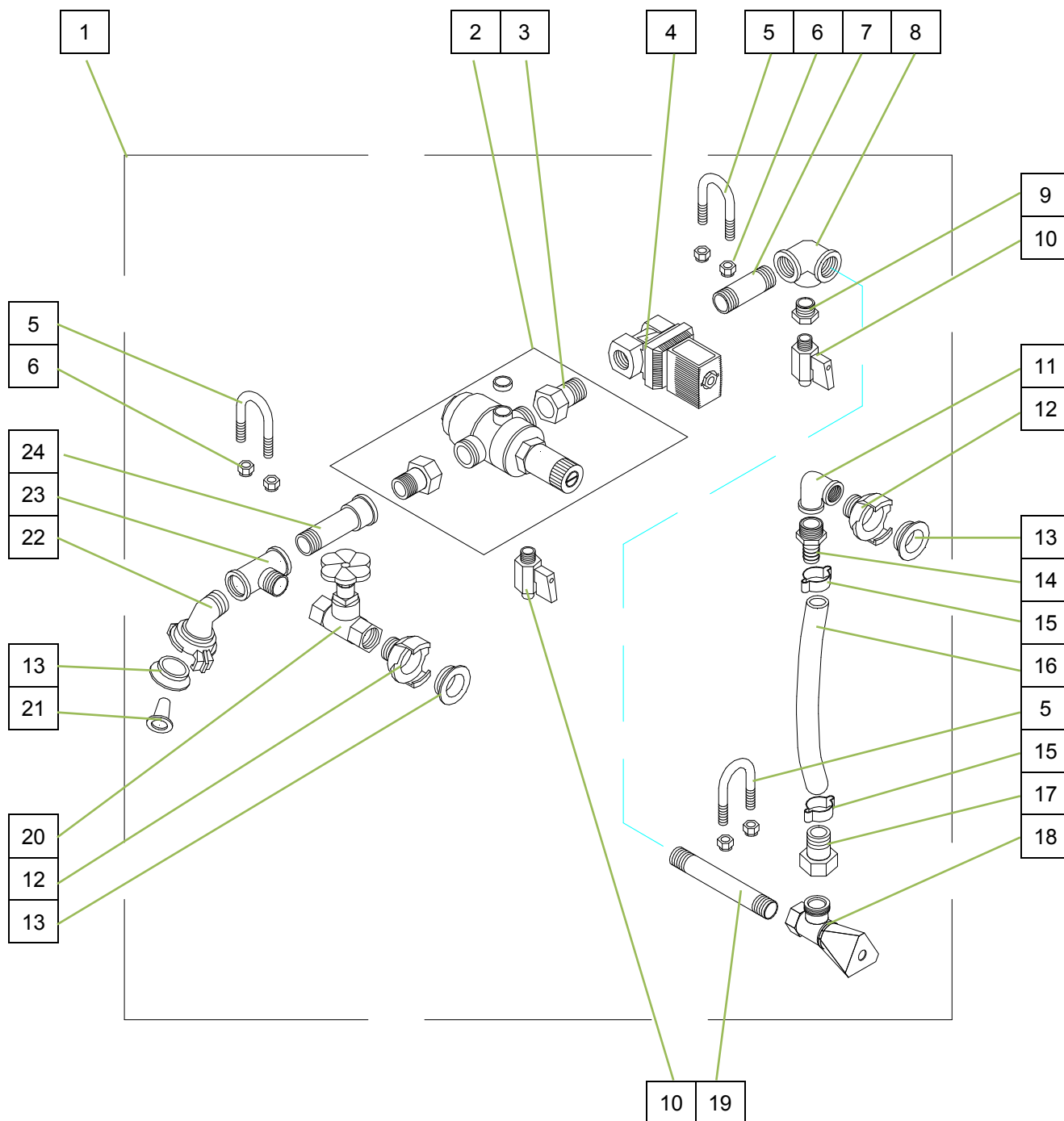
**ET drawing / ET list of HM 2002**

<b>ITEM</b>	<b>Qty</b>	<b>Article no.</b>	<b>Article description</b>
1	1	On request	CEE connection plug 3 x 16 A, yellow
2	1	On request	Motor protection switch
3	1	On request	CEE coupling 3 x 16A, yellow

## ET drawing / ET list of HM 2002



### 41.6 Water fitting HM 2002

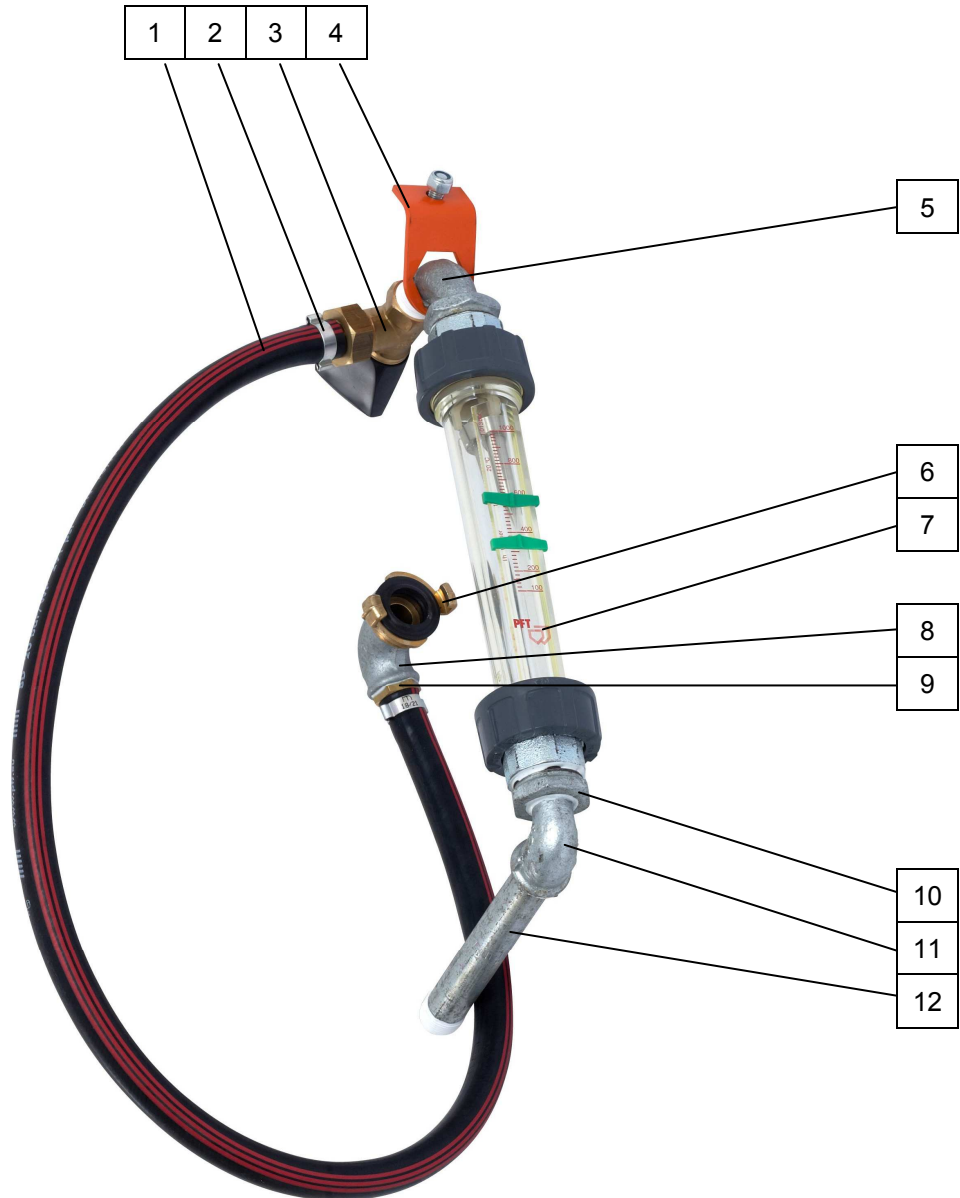




## ET drawing / ET list of HM 2002

ITEM	Qty	Article no.	Article description
1	1	00 00 27 75	Water fitting HM 2002 50 Hz
	1	00 59 34 64	Water fitting HM 2002 60 Hz
2	1	00 00 15 58	Pressure reducer D06F 1/2"
3	1	20 20 31 07	Flat nipple 1/2" external thread with union nut 3/4" internal thread
4	1	20 15 03 01	Solenoid valve 1/2", 230 V, 50 Hz Type 6213 A (water fitting 00002775)
		00 59 33 77	Solenoid valve 1/2", 120 V, 60 Hz Type 6213 A (water fitting 00593464)
5	3	20 20 99 85	Round steel bow M8 x 3/4" x 43, galvanised
6	6	20 20 72 00	Safety nut M8 galvanised
7	1	20 20 34 01	Double nipple 1/2" x 60, galvanised
8	1	20 20 46 20	Angular distributor 3 x 1/2" internal thread, galvanised
9	1	20 20 52 00	Reducing nipple 1/2" external thread 1/4" internal thread, galvanised
10	2	20 21 53 03	Ball valve 1/4" external thread with sleeve 10mm
11	1	20 20 36 11	Angle 1/2" internal thread, galvanised
12	2	20 20 09 00	Geka coupling 1/2" external thread
13	4	20 20 17 00	Gasket of Geka coupling (PACKING UNIT = PCS 50)
14	1	20 19 04 10	Hose coupling 1/2" external thread sleeve 1/2"
15	2	00 05 91 96	Hose clip 19-21
16	1	20 21 35 01	Water hose/air hose 1/2" x 700mm
17	1	20 20 37 80	Hose fitting 1/2" conical with union nut 3/4" internal thread
18	1	20 15 77 00	Needle valve 1/2"
19	1	20 20 34 11	Double nipple 1/2" x 120, galvanised
20	1	20 21 52 00	Shut-off valve 1/2" without drain
21	1	20 15 20 00	Strainer screen for Geka coupling (PACKING UNIT = 10 PCS)
22	1	00 14 75 67	Geka coupling nipple 1/2" external thread - 45° inclination
23	1	20 20 42 00	T-piece 1/2" internal thread 1/2" external thread 1/2" internal thread,
24	1	20 20 34 22	Extension 1/2" x 80, galvanised

### 41.7 Retrofit kit for water flow meter 100 - 1,000 l/h for HM 2002





## ET drawing / ET list of HM 2002

ITEM	Qty	Article no.	Article description
1	1	20213502	Water hose/air hose 1/2" x 960 mm
2	2	00059196	Hose clip 19-21
3	1	20157700	Needle valve 1/2" type 6701
4	1	00020117	Bracket of flow meter HM 2002
5	1	20203511	Bend 1/2" 90 ° external thread-external thread, galvanised
6	1	20200900	Geka coupling 1/2" external thread (PACKING UNIT = 10 PCS)
7	1	00002213	Water flow meter 100-1000 l/h 250 mm
8	1	20203611	Angle 1/2" internal thread, galvanised
9	1	20190410	Hose coupling 1/2" external thread sleeve 1/2"
10	1	20205400	Reduction nipple 1" external thread 1/2" internal thread
11	1	20203610	Angle 1/2" internal thread-external thread, galvanised
12	1	20203414	Double nipple 1/2" x 180, galvanised

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