



# Operating manual

**Mixing pump BOLERO 400V**

**Part 2 EC Declaration of Conformity**

**Overview - Operation - Spare parts lists**



Article number of the operating manual: 00 24 92 31

Article number of the parts list-machine: 00 23 12 13



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

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# 1 EC Declaration of Conformity

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

declare under our sole responsibility that the product:

**Machine type:** BOLERO  
**Type of device:** Mixing pump  
**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 (**2004/108/EG**).

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 relates exclusively to the machinery in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user. The declaration ceases to be valid, if the product is modified without authorisation.

**Person authorised to compile the relevant technical documentation:**

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**The technical documentation is available from:**

Knauf PFT GmbH & Co.KG, Technische Abteilung, Einersheimer Straße 53, 97346 Iphofen.

Iphofen.

Place, Date of issue

Name and signature

Details about the signatory

Dr. York Falkenberg

## 2 General

### 2.1 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 works! It forms part of the product and has to be kept in the immediate vicinity of the device and easily accessible for the staff at all times.

If the device is transferred 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.

### 2.2 Keep the manual for future reference

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

### 2.3 Division

The operating manual is divided into 2 books:

- Part 1 Safety

General safety instructions mixing pumps/feed pumps

Article number: 00 17 27 09

- Part 2 Overview, operation, service and spare parts lists (this book).

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



## 2.4 Technical data

### 2.4.1 General information

Description	Value	Unit
Weight	112	kg
Length approx.	800	mm
Width approx.	696	mm
Height approx.	1480	mm
Filling height	950	mm

### Individual weights

Description	Value	Unit
Pump motor with protective grille	42	kg
Undercarriage with pump and control cabinet	64	kg
Agitator	6	kg

### Hopper dimensions

Description	Value	Unit
Filling height	950	mm
Hopper content	68	l

## 2.5 Power connection



Fig. 1 motor protection switch

	Power	Setting value	Description
Mixing motor	1.9 kW	3.5 A	Q2



## General

### Electrical details

Description	Value	Unit
voltage, three-phase current 50 Hz	400	V
Power consumption, max.	5	A
Power input, max.	1.9	kW
Fuse protection	min. 3 x 16	A
Drive pump motor	1.9	kW
Speed pump motor approx.	90 / 181	rpm
Power input pump motor, max.	4.7	A

## 2.6 Operating conditions

### Environment

Description	Value	Unit
Temperature range	2-45	°C
Relative humidity, max.	80	%

### Duration

Description	Value	Unit
Max. operating time at a stretch	8	hours

## 2.7 Power values

### Pump capacity

#### D4-2 standard equipment

Description	Value	Unit
Pump capacity, approx.	6 / 12	l/min.
Operating pressure, max.	20	bar
Grain size max.	4	mm
Feed range *, max. at 25 mm Ø	15	m
Feed range *, max. at 35 mm Ø	25	m

\* reference value depending on conveying height, pump condition and version, mortar quality, composition and consistency

## 2.8 Sound power level

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

## 2.9 Vibrations

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



### 3 Dimension sheet

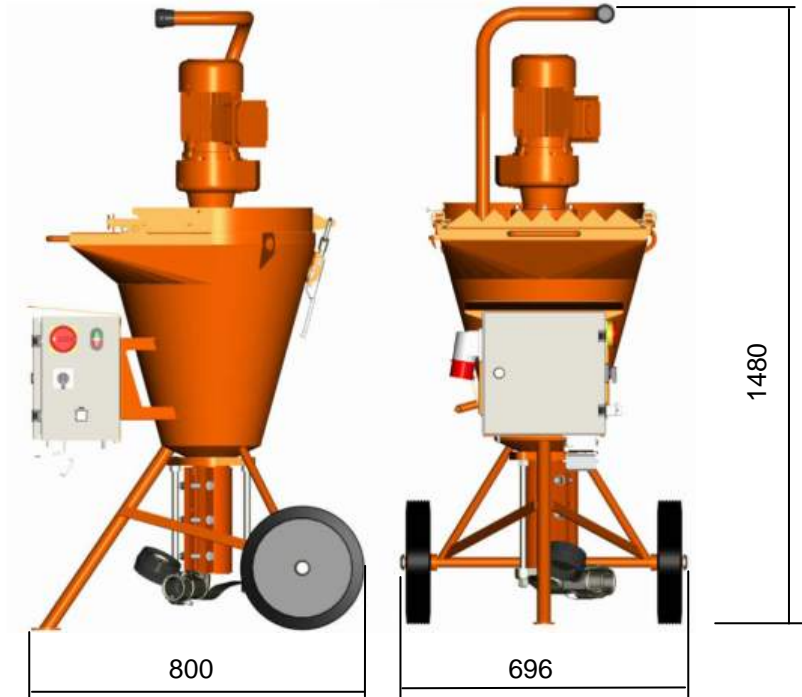


Fig. 2: Dimension sheet PFT BOLERO

#### 3.1 Name plate



Fig.3: Name plate

The following details can be found on the name plate:

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

#### 3.2 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 number
- Controller / signature
- Date of control

## 4 Assembly

### 4.1 Overview



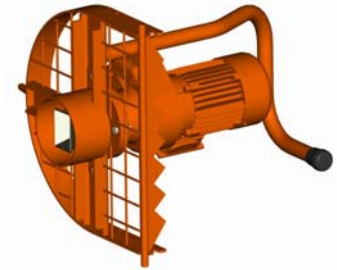
Fig. 5: Overview BOLERO

- |                           |                                       |
|---------------------------|---------------------------------------|
| 1 Motor protection handle | 6 Plastic wheel                       |
| 2 Gear motor              | 7 Connection mortar pressure hose     |
| 3 Crane eyelet            | 8 Mortar pressure gauge               |
| 4 Material container      | 9 Control cabinet                     |
| 5 Pump unit               | 10 Protective grille with sack opener |



## 5 Description of assemblies

### 5.1 Gear motor with protective grille



The mixing pump PFT Bolero consists of the following main components:

- Protective grille with motor flange and gear motor.
- The gear motor with motor flange can be removed from the material container for transport purposes.

Fig.6: Gear motor with protective grille

### 5.2 Agitator



- Agitator BOLERO with freewheel and lubrication nipple.

Fig.7: Agitator

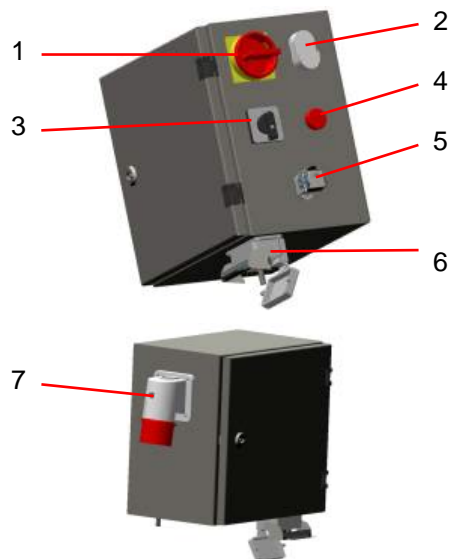
### 5.3 Material container with control cabinet



- Material container with control cabinet.

Fig. 8: Material container with control cabinet

## 5.4 Control cabinet

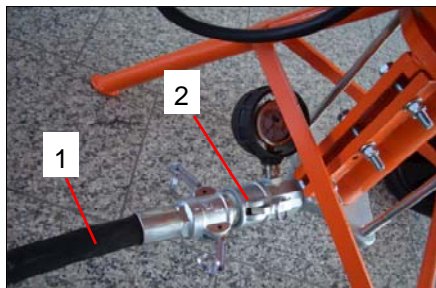


1. Main switch.
2. Operation button machine ON / OFF (control voltage).
3. Selector switch operating mode "mixing OFF pumps".
4. Control lamp LED red, motor protection switch triggered.
5. Remote control socket.
6. Connection 10 pin for pump motor.
7. Main terminal 16A.

Fig. 9: Control cabinet

## 6 Connection

### 6.1 Connection mortar hose



1. Connection mortar hose (1) at the mortar pressure gauge (2).

Fig. 10: Connection mortar hose



## 7 Recommended accessories



*Fig. 11: Power cable*

Power cable 5 x 4mm<sup>2</sup>, 25m with CEE plug and coupler 5 x 32A  
6h red  
**(article number 20423920)**



*Fig. 12: Mortar hose*

RONDO mortar pressure hose 25mm 15m with hydraulically fitted  
couplings

**(article number 00021101)**



*Fig. 13: Sponge ball*

RONDO sponge ball 30mm diameter solid (pack.unit 20)

**(article number 20210500)**



*Fig. 14: Extension cable*

Extension cable 25m for remote control with plug and coupling

**(article number 20456931)**

## 8 Accessories

### 8.1 Remote control cable



*Fig. 15: Remote control cable*

Remote control cable 25m complete with ON/OFF switch and  
control lamp

**(article number 20456929)**

## Functional description

# 9 Functional description

The handy PFT BOLERO is a combined mixing, pumping and spraying machine. The new PFT BOLERO is the perfect machine if material which is roughened up intermittently are to be processed.

In clockwise mode of the mixing shaft the material is mixed continuously. In anticlockwise mode the feed pump is connected and pumps the ready-mixed material to the point of use.

# 10 Material

## 10.1 Flowability / Flow characteristics



### NOTE!

- The pump D4-2 can be used up to 20 bar operating pressure.
- The possible conveying distance depends mainly on the flowability of the material.
- If 20 bar operating pressure are exceeded the mortar hose length has to be reduced.
- In order to avoid machine faults and increased wear of the pump motor, pump shaft and the pump itself, only original PFT spare parts such as
  - PFT rotors
  - PFT stators
  - PFT agitator
  - PFT mortar hoses must be used.
- These are compatible with each other and form a constructive unit with the machine.
- Non-compliance does not only cause loss of guarantee, but also bad mortar quality is to be expected.

# 11 Mortar pressure gauge



### Attention!

The use of a mortar pressure gauge is recommended for safety-related reasons.



Fig. 16: Mortar pressure gauge

### PFT mortar pressure gauge

Some advantages of the mortar pressure gauge:

- Exact adjustment of the correct mortar consistency.
- Constant control of the right conveying pressure.
- Early detection of clogging or overload of the pump motor.
- Relieving pressure.
- Is a major contribution to the safety of the operators.
- Long service life of the PFT pump parts.

# 12 Safety rules



### Attention!

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



# 13 Transport, packing and storage

## 13.1 Safety instructions for transport

### Improper transport



#### **CAUTION!**

##### **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.

- Never step under suspended loads.
- Observe the instructions regarding the provided anchorage points.
- Do not fix at projecting machine parts or eyelets of attached components and ensure safe fit of the sling gear.
- Use only approved lifting gear and sling gear with sufficient lifting capacity.
- Do not use any ruptured or frayed ropes and straps.
- Do not rest ropes and belts at sharp edges and corners, do not knot or twist.

## 13.2 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.

## Transport, packing and storage



### NOTE!

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

### 13.3 Transport in individual parts

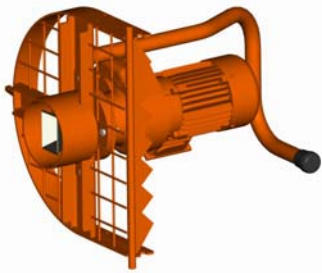


Fig. 17: Gear motor with protective grille



Fig. 18: Material container and control cabinet

1. Take the machine apart for easier transport.
2. The units gear motor with protective grille, material container with undercarriage and pump.
3. Loosen cable connections. Open linch pins, remove gear motor with protective grille from the undercarriage.

### 13.4 Transport by crane

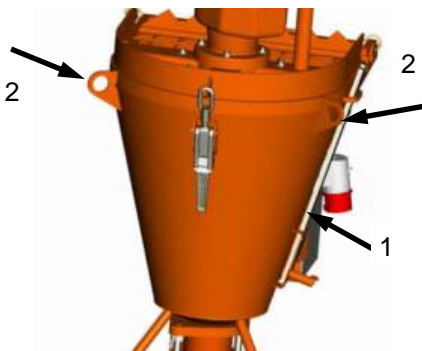


Fig. 19: Crane transport

#### Attachment:

- Remove loose parts (1) at the machine.
- Attach ropes or belts at lifting rings (2).
- Ensure that the package is straight, possibly observe eccentric centre of gravity.

### 13.5 Close quick closure during transport



Fig. 20: Close quick closure



#### CAUTION!

Ensure in general terms that the quick closure (1) for the protective grille is closed when moving the machine.





### Transport of already running machine



**DANGER!**  
**Risk 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 pressure gauge).

Carry out the following steps before beginning the transport:

1. Remove the cable from the main terminal.
2. Remove loose parts such as pump shaft.
3. Start transport.

## 14 Packaging

### On 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.



**CAUTION!**  
**Environmental damage due to wrong disposal!**

Packaging materials are valuable raw materials and many times 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.

## Operation

# 15 Operation

## 15.1 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
- Breathing 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.*

### Basic information



**WARNING!**

**Risk of injury due to improper operation!**

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

- 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 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.



## 16 Preparation

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



Fig. 21: Grille cover



**DANGER!**  
**Rotating mixing 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.



Fig. 22: Ensure stable stand

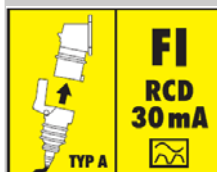
1. Put up the machine on a stable, even surface and secure against unwanted movements:
  - Neither tilt nor roll off the machine.
  - Put up the machine in such a way that it cannot be hit by falling objects.
  - The operating elements have to be freely accessible.

### 16.1 Connection of power supply



Fig. 23: Connect power

1. Connect machine (1) to three-phase network.



**DANGER!**  
**Danger to life 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.

## Trial run

### 16.2 Fill water into the material container



Fig. 24: Fill in water

1. Pour about 3 litres of water into the material container.



**NOTE!**

*Never let the pump run dry as this reduces the service life of the pump.*

### 17 Trial run

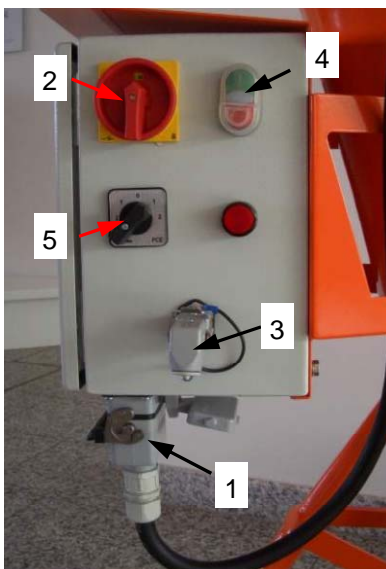


Fig. 25: Trial run

1. Check if the motor connection cable (1) is connected.
2. Turn main switch (2) to position "I".
3. Put on dummy connector (3).
4. Press green operating button (4) control voltage "ON".
5. Turn the selector switch (5) operating mode "mixing OFF pumps" to the right to stage 1.



**NOTE!**

*Depending on the infeed the motor can rotate clockwise or anticlockwise.*

*In clockwise mode of the agitator the material is mixed continuously. In anticlockwise mode the feed pump is connected and pumps the ready-mixed material to the point of use.*

6. Let the machine run shortly until the water has been pumped out of the machine container.
7. Switch off the machine at selector switch (5) (position "0").

### 18 Mortar pressure gauge



Fig. 26: Mortar pressure gauge



**DANGER!**  
**Operating pressure too high!**

Machine parts can open in an uncontrolled manner and injure the operator.

- Do not operate the machine without mortar pressure gauge.
- Use only mortar hoses with a permissible operating pressure of at least 40 bar.
- The burst pressure of the mortar hose must reach at least 2.5 times the value of the operating pressure.

## 19 Mortar hoses

### 19.1 Prepare mortar hoses

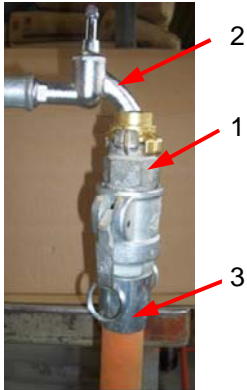


Fig. 27: Prepare mortar hose

1. Connect the cleaner coupling (1) at the water extraction valve (2).
2. Connect mortar hose (3) and water.
3. More mortar hose and cleaner coupling again and separate.
4. Remove all the water from the mortar hose.
5. Pre-lubricate the mortar hose with about one litre of wallpaper paste.
6. The wallpaper paste is mixed through the mortar hose with the first mixing.
7. Collect the wallpaper paste in suitable container and dispose of as per regulations.



#### **DANGER!**

Torn off hoses can beat about and injure bystanders!  
Never loosen the hose couplings as long as there is pressure on the mortar hoses (check mortar pressure gauge)! The mix could burst out under pressure and result in serious injuries, especially injuries to the eyes.

### 19.2 Connect mortar hose

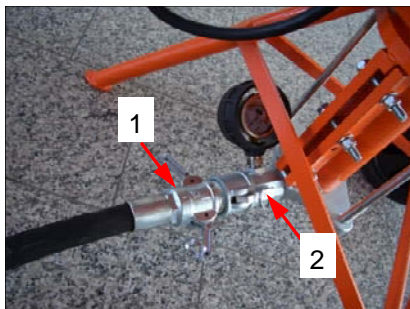


Fig. 28: Connect mortar hose

1. Connect mortar hose (1) at the mortar pressure gauge (2).



#### **NOTE!**

Ensure clean and correct connection of the couplings! Ensure tightness. Dirty couplings and rubber seals are not watertight, and water might leak under pressure inevitably leading to blockages.

2. Lay mortar hoses in large radius so that no kinks form in the hoses.
3. Attach risers carefully in order to prevent them from tearing off under their own weight.

## Putting the machine into operation

### 19.3 Connect Zargomat and gluing gun

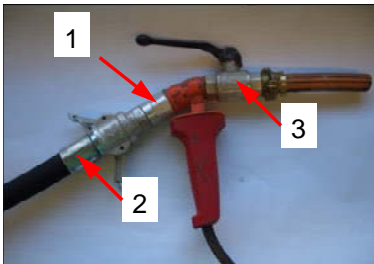


Fig. 29: Gluing gun

1. Connect Zargomat and gluing gun (1) to mortar hose (2).
2. Ensure that the ball valve (3) at the gluing gun is closed.

## 20 Putting the machine into operation

### 20.1 Start off machine



#### Attention!

Never fill the material container when the agitator is not running.

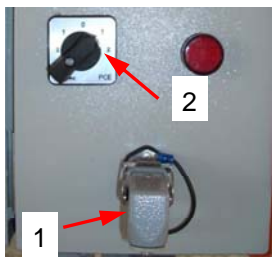


Fig. 30: Mixing

1. For mixing the bagged materials put on the dummy plug (1) at the control cabinet.
2. Turn the selector switch (2) operating mode "mixing OFF pumps" to the right to stage 1. Optionally stage 1 or 2.
3. The pump has to be switched off, only the agitator should be running.



Fig. 31: Fill in water

4. Pour specified water quantity (mixing water) for one material sack into the material container.

### 20.2 Fill machine with factory prepared dry material



#### 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

### 20.3 Hazardous dusts



**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).*



Fig. 32: Fill in bagged material

1. Empty the bagged material into the material container.



**NOTE!**

*For initial filling with bagged material slowly pour half of the first bag into the material container!*

2. Mix material well.
3. Turn selector switch operating mode "mixing OFF pumps" to position "0".

### 20.4 Connect remote control

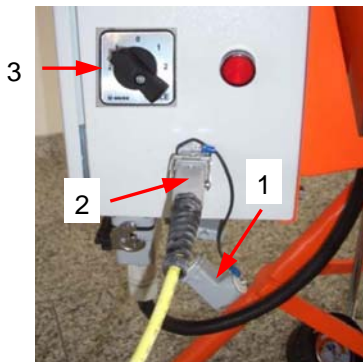


Fig. 33: Remote control

1. Remove dummy plug (1) from control cabinet.
2. Connect the remote control cable (2) of the Zargomat and gluing gun at the control cabinet.



**NOTE!**

The machine can be switched on and off using the ON/OFF switch at the Zargomat and gluing gun.

3. Turn the selector switch (3) operating mode "mixing OFF pumps" to the left to stage 1. Optionally stage 1 or 2.

## Switching on

### 21 Switching on

#### 21.1 Apply material

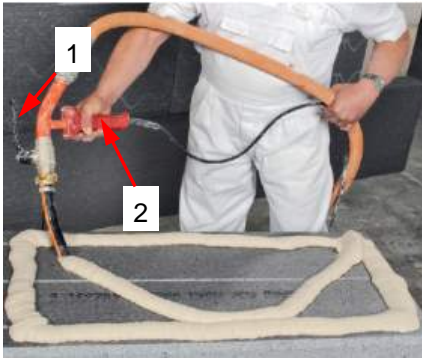


Fig. 34: Apply material

1. Point the gluing gun in the direction of the object to be processed.
2. Ensure that nobody is in the discharge area of the gluing gun.
3. Open the ball valve (1).
4. Actuate the ON/OFF switch (2) at the gluing gun.
5. The conveying process of the material starts.



**DANGER!**  
**Risk of injury from discharged mortar!**

Discharged mortar may lead to injuries to eyes and face.

- Never look into the spraying device.
- Always wear protective goggles.
- Always position yourself in such a way that you are not hit by the mortar being discharged.



**NOTE!**

*The possible conveying distance depends mainly on the flowability of the mortar. Heavy, sharp-edged mortar has poor flow characteristics. Runny materials have good flow characteristics.*

*If 20 bar operating pressure are exceeded thicker mortar hoses have to be used.*



**NOTE!**

*If the water quantity is too little even mixing and spraying is no longer guaranteed; blockages may form inside the hose and high wear of the pump parts will become an issue.*



## 22 Interruption of work



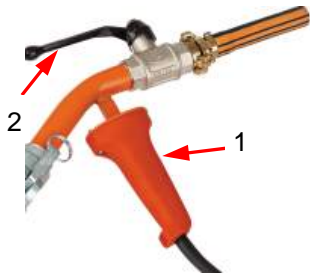
### NOTE!

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.

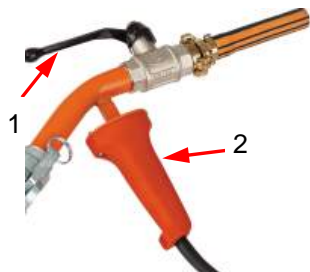
### 22.1 Switching off the machine



1. Actuate the ON/OFF switch (1) (switching off).
2. The machine stops.
3. Close ball valve (2).

Fig. 35: Switching off the machine

### 22.2 Switch machine on again



1. Open the ball valve (1).
2. Actuate ON switch (2) at the gluing gun (switching ON).
3. The machine starts again.

Fig. 36: Switch on machine

## 23 Cleaning

### 23.1 Check mortar pressure

#### 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 works and secure against restarting.

The machine has to be cleaned daily after work and in case of longer breaks.

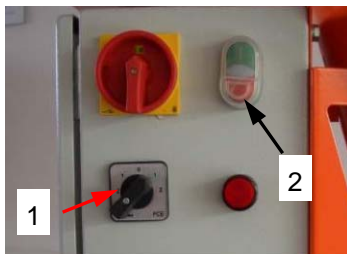


Fig. 37: Switching off

Switching off the machine:

1. Turn selector switch (1) operating mode "mixing OFF pumps" to position "0".
2. Press red operating button (2) control voltage "OFF".

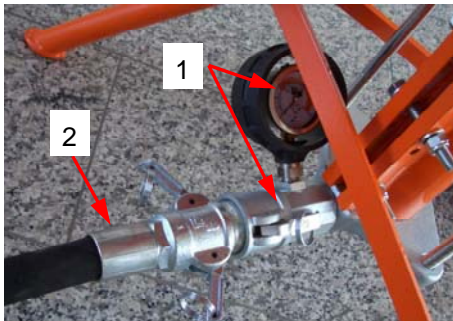


Fig. 38: Mortar pressure to "0 bar"

3. Check at the mortar pressure gauge (1) if the mortar pressure is at "0 bar".



**DANGER!**  
**Overpressure on the machine!**

When opening machine parts they can open in an uncontrolled manner and injure the operator.

- Open machine only when the pressure is at "0 bar".



**NOTE!**

*Mortar hoses and spraying device have to be cleaned immediately after finishing work.*

4. Disconnect mortar hose (2) from mortar pressure gauge (1).

## 23.2 Clean mortar hose

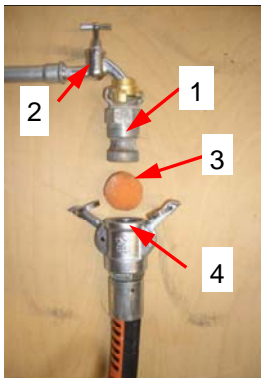


Fig. 39: Clean mortar hoses



### NOTE!

Material remains that can deposit on the inside of the mortar hose, may cause damages, continue to build up and narrow the diameter. Clean mortar hoses therefore are indispensable to have trouble-free conveying next time the hoses are being used.

1. Connect the cleaner coupling (1) at the water extraction valve (2).
2. Press the water saturated sponge ball (3) into the mortar hose (4).



### NOTE!

*Do not rinse the mortar hoses with water before. The material has to be pushed out of the hoses with the sponge ball.*

3. Connect the mortar hose (4) with the spraying device at the cleaner coupling (1).
4. Open the water extraction valve (2) until the sponge ball (3) exits the spraying device.
5. In case of strong soiling repeat this process.
6. In case of different hose diameters, the mortar hoses have to be cleaned separately with the matching sponge balls.

## 23.3 Clean Zargomat and gluing gun



Fig. 40: Clean Zargomat gun

1. Remove the remote control cable of the Zargomat and gluing gun from the control cabinet.
2. Disconnect the Zargomat and gluing gun from the mortar hose.
3. Clean the Zargomat and gluing gun.

## Cleaning

### 23.4 Clean the material container



Fig. 41: Cleaning

Hose out the material container with a water jet.



**NOTE!**

*Do not direct the water jet on electrical parts, such as gear motor or control cabinet.*

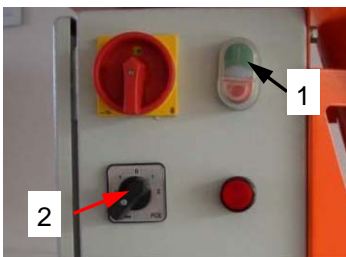


Fig. 42: Switching on

#### Switching on the machine:

1. Press green operating button (1) control voltage "ON".
2. Turn the selector switch (2) operating mode "mixing OFF pumps" to position "1".
3. Pump the water from the material container until clear water emerges from the mortar hose gauge.
4. Switch off the machine.

### 23.5 Open protective grille



Fig. 43: Disconnect power supply



**WARNING!**

**Danger to life from unauthorised switching on!**

Disconnect the power supply by removing the connection cable



Fig. 44: Open the protective grille

1. Open the quick closure (1) and tip the motor with protective grille.

### 23.6 Clean material container



**DANGER!**  
Never reach into rotating or moving parts when the machine is running!

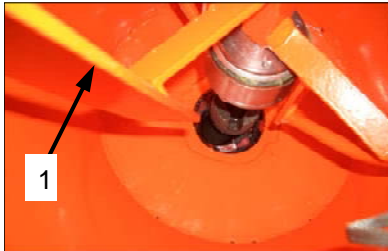


Fig. 45: Agitator

1. Remove the agitator (1) from the material container and completely clean from material remains.
2. Clean material container.



**NOTE!**

*Do not use aggressive detergents.*

3. Put back the agitator after cleaning.

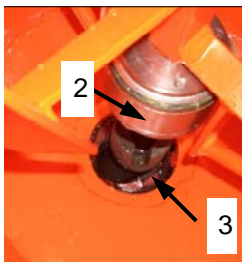
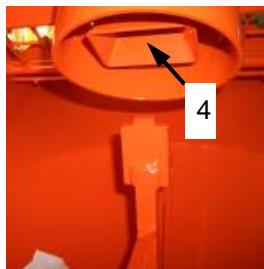


Fig. 46: Put back agitator



**NOTE!**

*When inserting the agitator (1) ensure that the freewheel of the agitator (2) in the head of the rotor (3) grips properly into the drive dog (4) when closing the protective grille.*



Fig. 47: Close protective grille

4. Close quick closure (5).




**NOTE!**

*Ensure that the quick closure is always closed.*

**Risk of frost**

## 24 Risk of frost



**CAUTION!**  
**Damage by frost!**

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

- In case of danger of frost the machine and conduits have to be emptied completely from residue water.

## 25 Stopping in case of emergency


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

**Stopping in case of emergency**

1. In case of danger proceed as follows:
2. Switch off immediately the main switch.
3. Secure the main switch against reactivation.
4. Inform the manager on site.
5. If necessary call for medical assistance and fire brigade.
6. Recover persons from the danger zone, initiate First Aid measures.
7. Keep access routes free for emergency vehicles.

**After the rescue measures**

8. Inform the responsible authority if the severity of the emergency permits.
9. Commission specialists with emergency repairs.



**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.



## 26 Work on troubleshooting

### 26.1 Reaction in the event of faults

#### Reaction in the event of faults

Basically 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.*

### 26.2 Fault displays

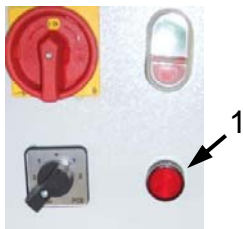


Fig. 48: Fault displays

The following installation indicates faults:

Pos.	Light signal	Description
1	red pilot lamp	Lights up on motor protection switch fault.

### 26.3 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.

## Work on troubleshooting



### 26.4 Safety

- The works for the 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.
- Works at the electrical system must be carried out by qualified electricians only.

#### Personal protective equipment

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

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

### 26.5 Table of faults

Fault	Possible cause	Rectification of faults	Rectification by
Machine does not start <b>power</b>	Power supply not in order	Repair power supply	Service engineer
	Main switch not activated	Activate main switch	Operator
	RCCB was triggered	Reset RCCB	Service engineer
	Motor protection switch triggered	Turn motor protection switch in control cabinet to position 1	Service engineer
	"Operation button ON" not pressed	Press "operation button ON"	Operator
	Contactator defective	Change contactor	Service engineer
	Fuse defective	Change fuse	Service engineer
Machine does not start <b>material</b>	Thickened material in material container	Remove thickened material or add water	Operator
	Excessively dry material in pump part	Remove pump and clean	Service engineer
Pump motor does not start	Pump motor defective	Exchange pump motor	Service engineer
	Connection cable defective	Change connection cable	Service engineer
	Plug or inbuilt socket defective	Change plug or inbuilt socket	Service engineer
	Motor protection switch defective or triggered	Change motor protection switch or reset	Service engineer




**Work on troubleshooting**

Mortar flow ceases (air bubbles)	Poor mixture	Add more water Let mixture be mixed for a longer time	Operator
	Clumped material	Add more water or clean agitator or replace	Operator
	Agitator defective	Replace agitator	Operator
	Driving dog defective	Replace driving dog	Service engineer
Mortar flow "thick-thin"			
	Rotor worn or defective	Replace rotor	Service engineer
	Stator worn or clamping bracket tightened too little	Replace stator or re-tighten clamping bracket	Service engineer
	Clamping bracket defective (oval)	Replace clamping bracket	Service engineer
	Inner wall of mortar hose defective	Replace mortar hose	Operator
	Rotor too deep in pressure flange	Replace pressure flange	Service engineer
	No original PFT spare parts	Use original PFT spare parts	Service engineer
Control lamp red, fault lights up	Overload due to the pump getting blocked with dry material	Remove pump and clean	Service engineer
	Overload due to low water volume	Add more water when starting off	Operator
	Motor protection switch pump motor (16 A) triggered	Reactivate protection switch	Service engineer

## Conveying stationary / clogging

### 27 Conveying stationary / clogging

Clogging might form in the mortar hoses for several reasons. This means that the material to be conveyed remains stuck in the mortar hoses and cannot be pumped to the hose end.

#### 27.1 Signs for clogging

Implementation by operator:

- Blockages can occur in the pressure flange or in the mortar hoses.
- Indications are:
  - rapidly increasing pressure head,
  - blocking of pump,
  - running difficulties or blockage of the pump motor,
  - expansion and turning of the mortar hose,
  - no material discharge at the hose end.

#### 27.2 Causes for blockages:

- Highly worn mortar hoses,
- work interruptions,
- badly greased mortar hoses,
- residual water in mortar hose,
- clogging of the pressure flange,
- strong tapering at the couplings,
- kink in mortar hose,
- badly pumpable and demixed materials.

#### 27.3 Earlier damage to the mortar hose



**NOTE!**

*If in the event of a machine fault by material clogging the pressure in the mortar hose exceeds 60 bar, even only temporarily, replacement of the mortar hose is recommended as there might be damage in the hose that is not externally visible.*

#### 27.4 Removal of clogging in hoses



Fig. 49: Switching off



**DANGER!**

**Danger from discharged material!**

Never loosen the hose couplings as long as the pressure head is reduced! Material to be conveyed can be discharged under pressure and cause injuries particularly to the eyes.

Persons commissioned with the cleaning of clogged hoses have to wear personal protective equipment (protective goggles, gloves) for safety reasons, and to position themselves in such a way that they cannot be hit by discharged material. Other persons have to clear the area.



Fig. 50: Mortar pressure gauge

## 27.5 Relieve pressure

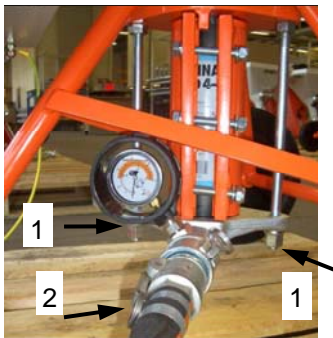


Fig. 51: Loosen nuts.

1. Cover the area pressure flange until mortar hose with foil.
2. Slightly loosen both nuts at the tie rod (1) so that the residual pressure can escape completely.
3. Loosen the hose coupling (2) and clean mortar hoses immediately.
4. For purging the remaining mortar from the mortar hoses, insert a water hose into the mortar hose and rinse out the mortar (purge hose art.no. 00113856).
5. Afterwards re-tighten the nuts and the tie rod (1).

## 28 Action in case of power cut



Fig. 52: Mortar pressure to "0 bar".

### In case of longer power cut:

1. Check the mortar pressure gauge if the mortar pressure has lowered to "0 bar". If required lower the pressure by opening the taps at the spraying device.



### **DANGER!**

#### **Overpressure on the machine!**

When opening machine parts they can open in an uncontrolled manner and injure the operator.

- Open machine only when the pressure is at "0 bar".

## Action in case of power cut

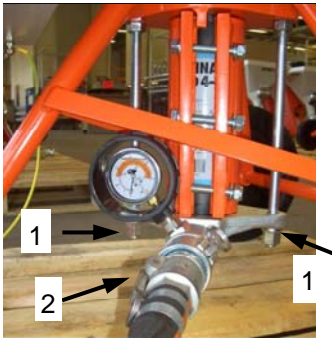


Fig. 53: Loosen nuts.

2. Slightly loosen both nuts at the tie rod (1) so that the remaining pressure can escape completely.
3. Loosen the hose coupling (2) and clean mortar hoses immediately.
4. Remove the nuts from the tie rod (1).

### 28.1 Cleaning the pump

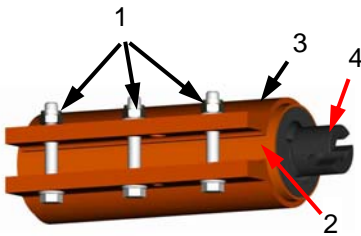


Fig. 54: Cleaning the pump.

1. Remove pump unit
2. Loosen nuts from the clamping bracket (1).
3. Push the stator (2) out of the clamping bracket (3).
4. Push the rotor (4) out of the stator (2) and clean.
5. Clean pressure flange.
6. Clean material container and agitator.
7. Reassemble completely the pump unit.

### 28.2 Re-tighten pump

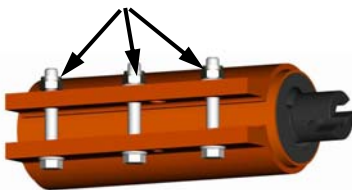


Abb. 55: Tighten pump.

1. In the case of decreasing feed pressure the stator can be re-tightened.
2. Do not re-tighten the pump during operation.
3. Pump parts that do not deliver the required feed pressure when tightened have to be replaced.

When replacing the pump it has to be ensured that

- all screws of the retaining clamp are equally tightened.
- In case of rubber stators, the tension rod bolts are not tightened too much and that the sheath end lies flush and centrally in the flanges.



**NOTE!**

Store the assembled pump (rotor in stator) only for a few days as rotor and stator can permanently connect to each other in case of prolonged storage.



## 29 Maintenance

### 29.1 Safety

- The maintenance works described here can be carried out by the operator, unless marked otherwise.
- Some maintenance 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.
- Works at the electrical system must be carried out by qualified electricians only.

#### Basic information



#### **WARNING!**

#### **Risk of injury due to incorrect implementation of maintenance works!**

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

Therefore:

- Prior to starting the works ensure that there is enough space to carry out the works.
- Ensure order and safety at the assembly site! Loose, stacked components or components lying about are accident sources.
- If components were removed, ensure proper assembly, put back all fastening elements and observe torque indications for screws.

#### Electrical system



#### **DANGER!**

#### **Danger to life from electric current!**

There is danger to life 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 works and secure against restarting.

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

## Maintenance

### 29.2 Cleaning

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



**CAUTION!**

**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 covers completely after cleaning.

### 29.3 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	Grease the freewheel bearing after cleaning the machine.	Operator
	Visual and functional inspection of all safety installations.	
	Check all parts subject to wear.	
	Check conveying hoses and couplings.	
	Visual inspection of the electrical cables.	
Yearly	Check screw connections.	Service engineer

### 29.4 Gear motor



**NOTE!**

The gear motor is filled as standard with 0.9 litres of lubricating oil ISO VG 220 that has to be changed all 1000 hours, however all 3 years at the latest.

Fig. 56: Gear motor



## 29.5 Remove agitator

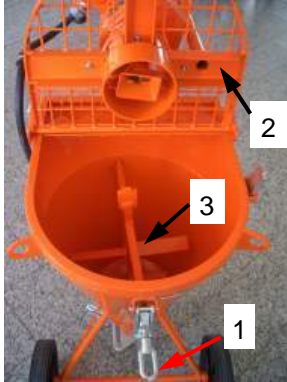


Fig. 57: Remove agitator



### **DANGER!** **Overpressure on the machine!**

When opening machine parts they can open in an uncontrolled manner and injure the operator.

- Open the mortar hoses only when the pressure has dropped to "0 bar".

1. Open quick closure.
2. Flip open gear motor with protective grille.
3. Remove agitator.

## 29.6 Lubricate freewheel

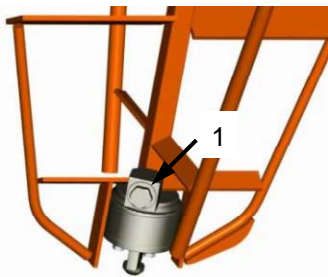


Fig. 58: Lubricate freewheel

1. Unscrew the locking screw (1) at the freewheel.
2. Place the grease gun at the greasing nipple and lubricate until clean grease can be seen at the freewheel (Lithium-based multi-purpose grease).
3. Screw in locking screw at freewheel.
4. Check the fit of the freewheel for contamination.
5. Insert agitator
6. Align driver and agitator and close gear motor with protective grille.

## 29.7 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 used tools, materials and other equipments were 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.

## 30 Disassembly

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

### 30.1 Safety

- The disassembly must be carried out only by specially trained skilled personnel.
- Works at 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! Loosely stacked components or components lying about and tools are accident sources.
- 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 manufacturer.

#### Electrical system



#### **DANGER!**

#### **Danger to life from electric current!**

There is danger to life 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.





## 30.2 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 energies.
- Remove operating supplies as well as remaining processing materials and dispose of in an environmentally-friendly way.

## 30.3 Disposal

If not agreement for the recovery or the disposal was made, recycle the disassembled components:

- Scrap metals.
- Recycle plastic elements.
- Dispose of remaining components separately according to their material characteristics.



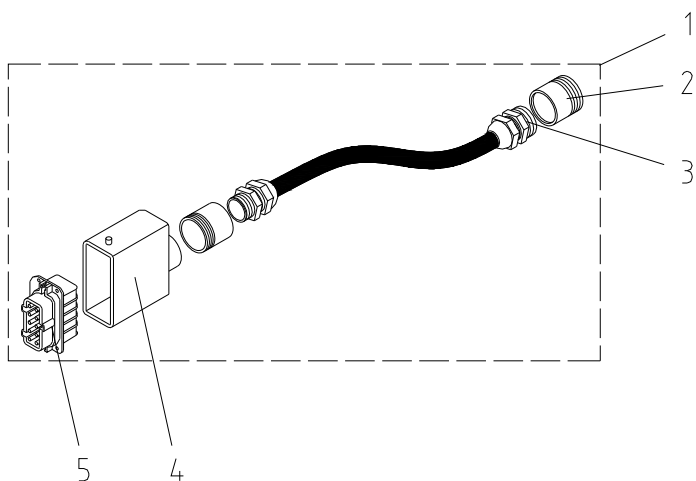
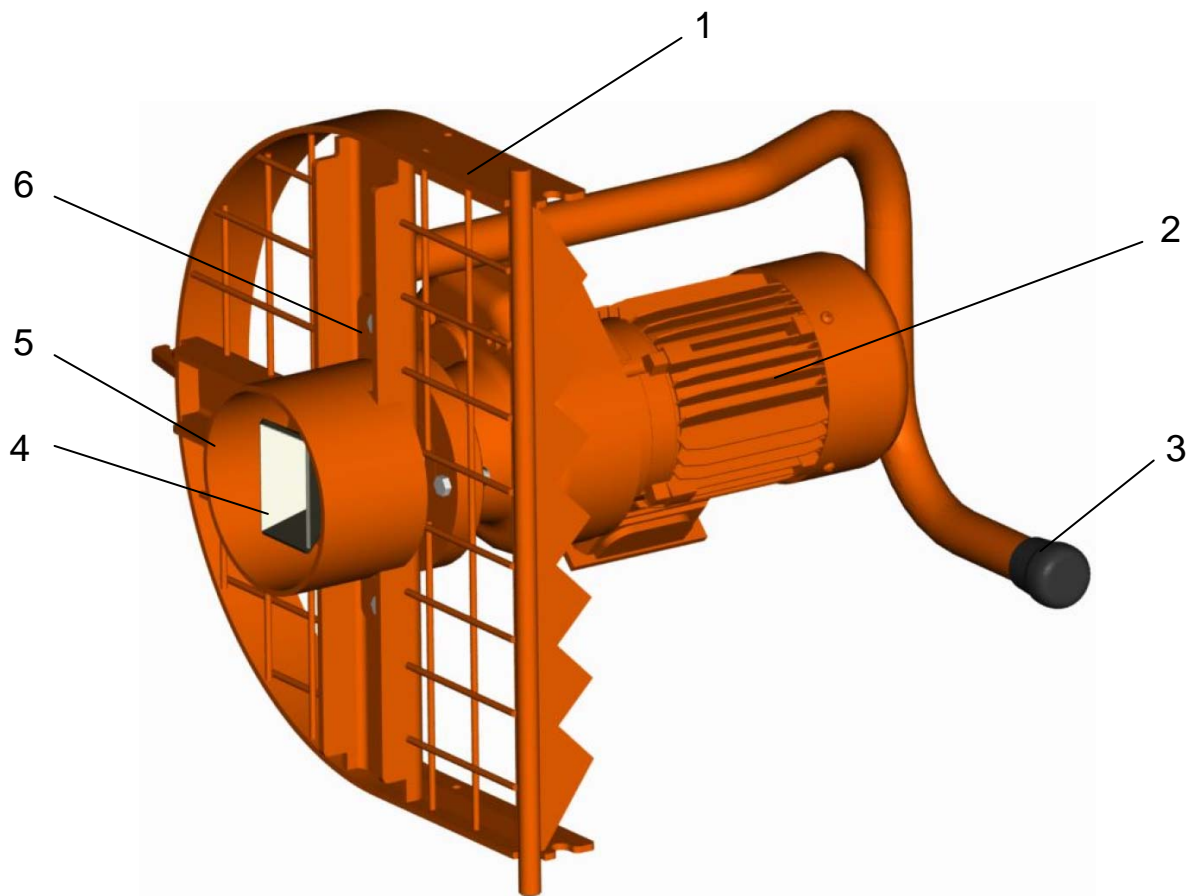
**CAUTION!**  
**Environmental damage in case of incorrect disposal!**

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.

## 31 Spare parts drawings / Spare parts lists

### 31.1 Gear motor with protective grille

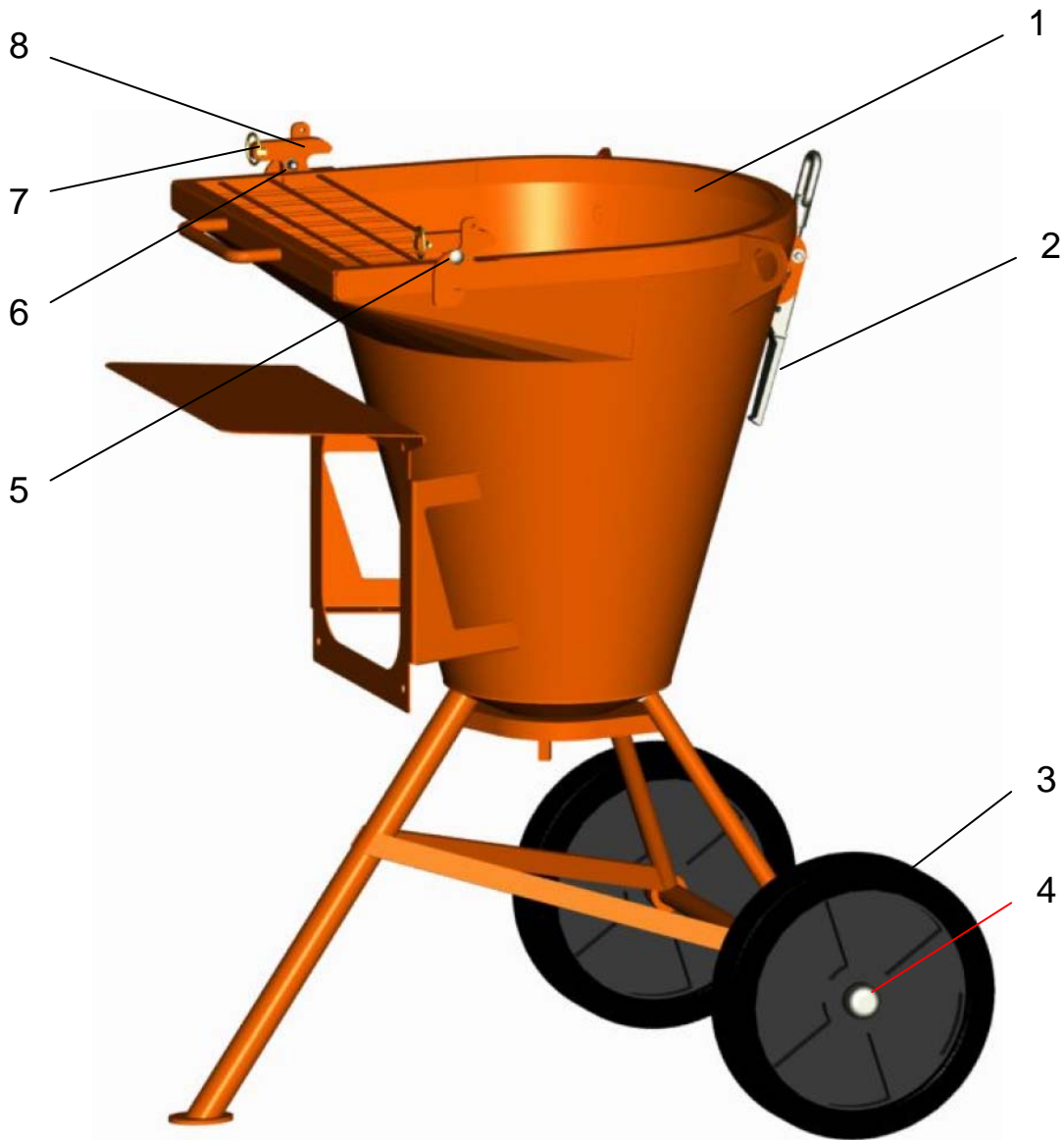




## Spare parts drawings / Spare parts lists

POS	Qty	Article no.	Article description
1	1	00 23 14 65	Protective grille with motor flange BOLERO RAL2004
2	1	00 23 21 80	Gear motor SK25 1.9kW 181U/min RAL2004 with tilt switch
3	1	00 04 80 15	End cap PVC 1" (round, black)
4	1	00 23 27 38	Drive dog BOLERO galvanised
5	1	00 23 64 43	Protective tube for drive dog BOLERO RAL2004
6	4	20 20 78 00	Hexagon screw M8 x 30 DIN 933 galvanised (pack.unit 10)
1	1	00 23 65 10	Motor connection cable 1.70m 16A 10P. Bolero
2	2	00 23 65 15	Extension (metal) M25x1.5 / M32x1.5
3	2	00 18 63 77	Skintop screw connection M 32 x 1.5
4	1	00 02 20 38	Sleeve housing straight 10 pin HAN 10 E
5	1	20 43 23 00	Pin insert 10 pin HAN 10 E

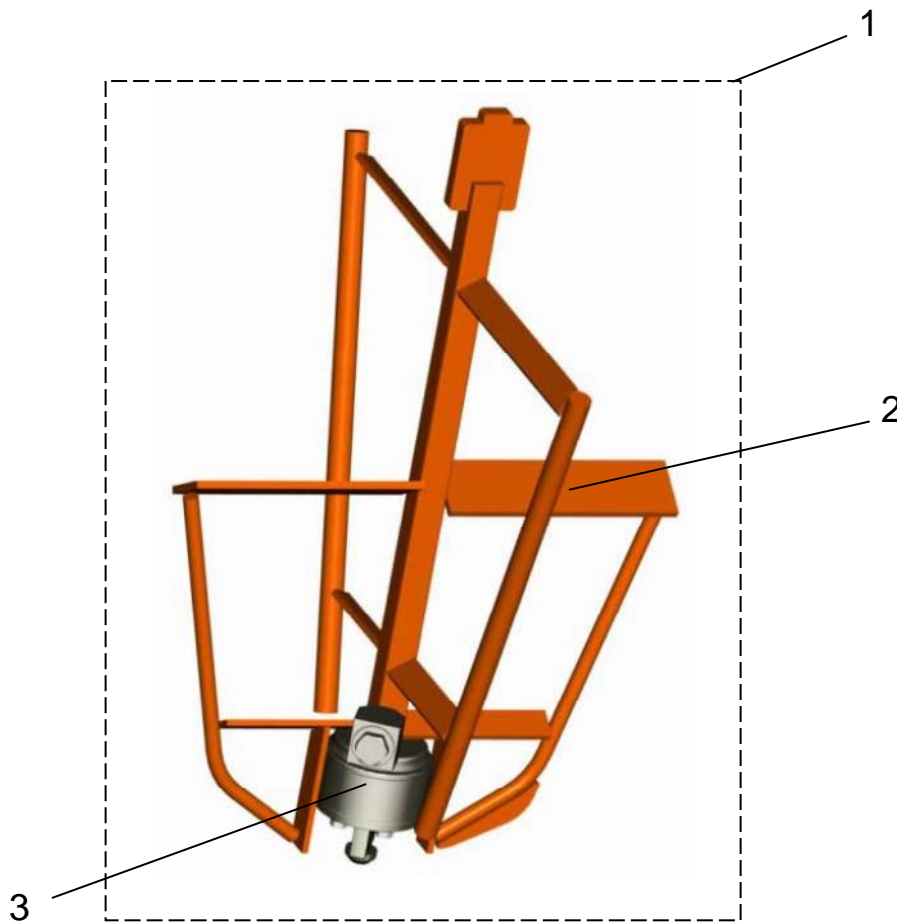
### 31.2 Material container



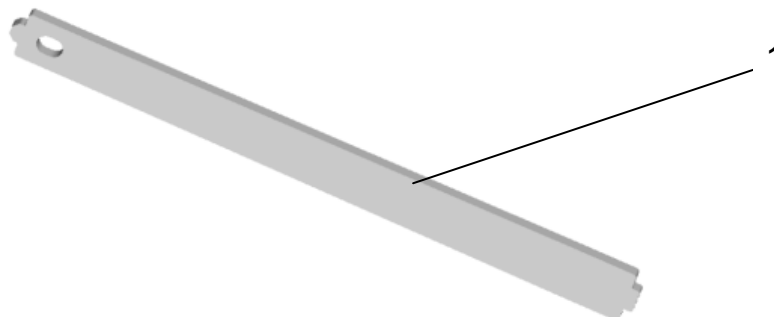
**Spare parts drawings / Spare parts lists**

<b>POS</b>	<b>Qty</b>	<b>Article no.</b>	<b>Article description</b>
1	1	00 23 12 37	Material container BOLERO RAL2004
2	1	20 10 08 01	Quick release fastener with locking device M14
3	2	00 17 51 89	Wheel 300 x 60 plastic
4	2	00 00 26 32	Quick fastener with cap 25s x N 2 7
5	2	20 20 63 09	Saucer-head screw M6 x 25 galvanised (pack.unit 10)
6	2	20 20 62 01	Safety capped nut M6 galvanised pack.unit 10)
7	2	20 10 10 10	Linch pin D 4.5 with ring
8	2	00 23 20 33	Hinge BOLERO RAL2004

### 31.3 Agitator BOLERO with freewheel



### 31.4 Pump shaft





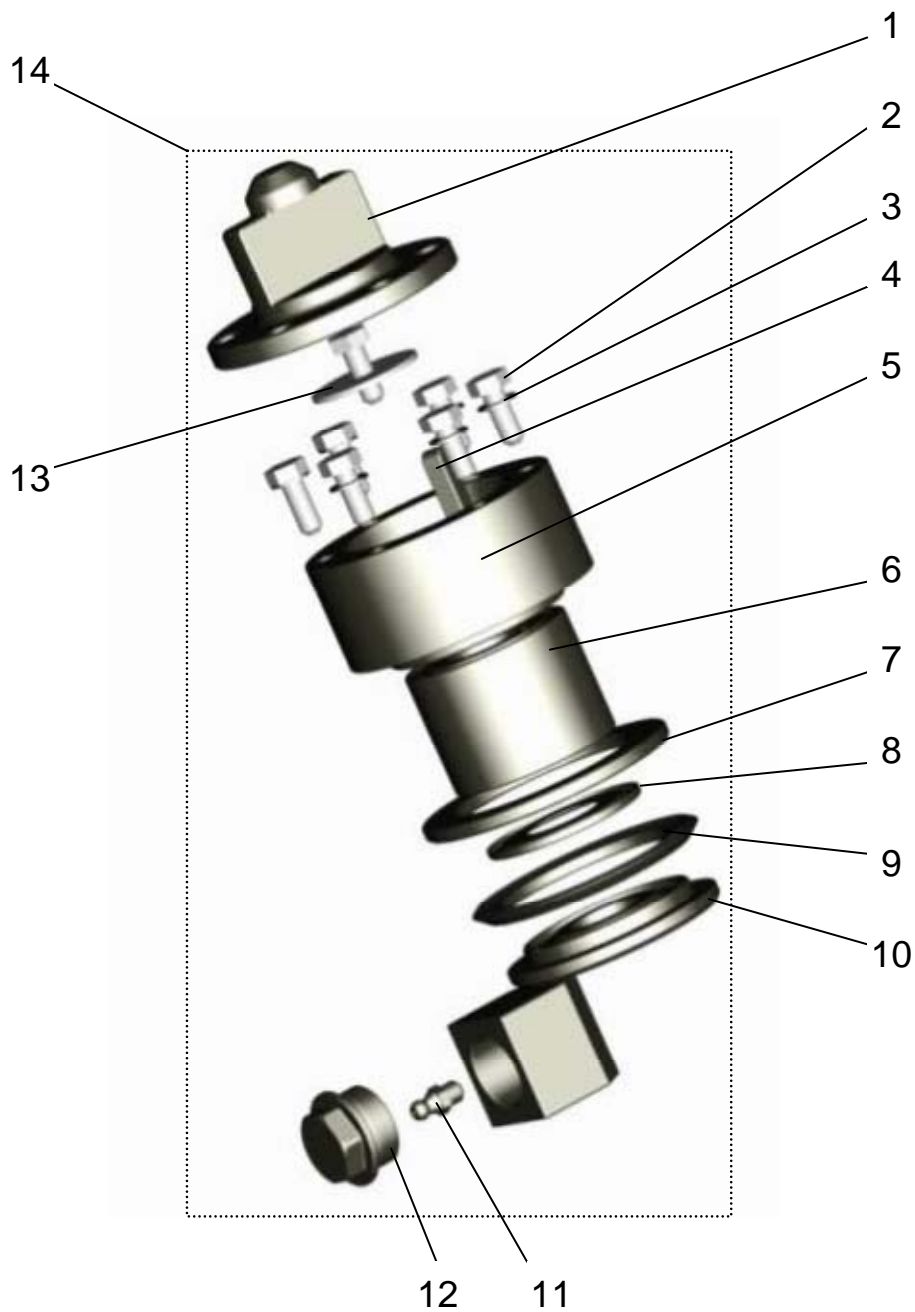
## Spare parts drawings / Spare parts lists

POS	Qty	Article no.	Article description
1	1	00 23 13 81	Agitator BOLERO with freewheel
2	1	00 23 13 82	Agitator BOLERO RAL2004
3	1	00 23 11 60	Freewheel BOLERO cpl.

POS	Qty	Article no.	Article description
1	1	00 23 28 90	Pump shaft BOLERO galvanised

**Field of application pump shaft:** For all pumpable wet products and pasty materials that do not require to be mixed.  
Place the pump shaft with the elongated hole facing downwards.

### 31.5 Freewheel art. No. 00231160



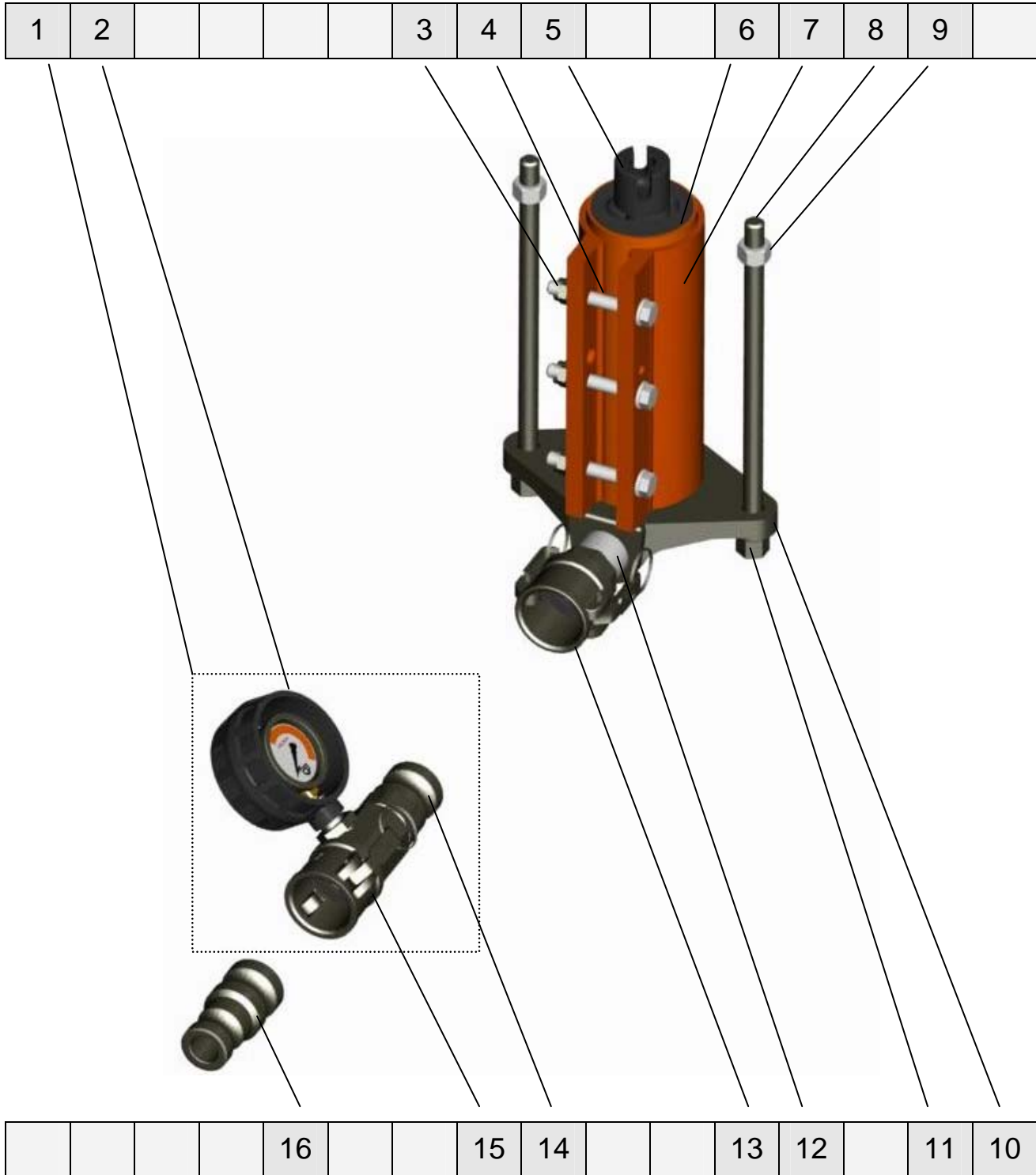




## Spare parts drawings / Spare parts lists

<b>POS</b>	<b>Qty</b>	<b>Article no.</b>	<b>Article description</b>
1	1	00 23 11 46	Flange housing galvanised freewheel
2	7	20 20 71 01	Hexagon screw M6 x 16 DIN 933 galvanised (pack.unit 10)
3	7	20 20 93 12	Serrated lock washer A 6.4 DIN 6798 galvanised
4	1	00 23 11 42	Feather key A 6 x 6 x 32
5	1	00 23 11 44	Housing support freewheel VA
6	1	00 23 11 53	Freewheel
7	1	00 23 11 58	Shaft washer
8	1	00 23 11 56	Nilos ring
9	1	00 23 11 55	Gamma ring
10	1	00 23 11 52	Cover of housing for greasing nipple freewheel VA
11	1	00 25 54 63	Greasing nipple M 6 x 1.0
12	1	00 25 54 61	Locking screw M22x1.5 DIN7604 VA
13	1	20 20 93 11	Large diameter washer 6.4 x 30 x 1.5 galvanised (pack.unit 10)
14	1	00 23 11 60	Freewheel BOLERO cpl.

**31.6 Pump unit with mortar pressure gauge**



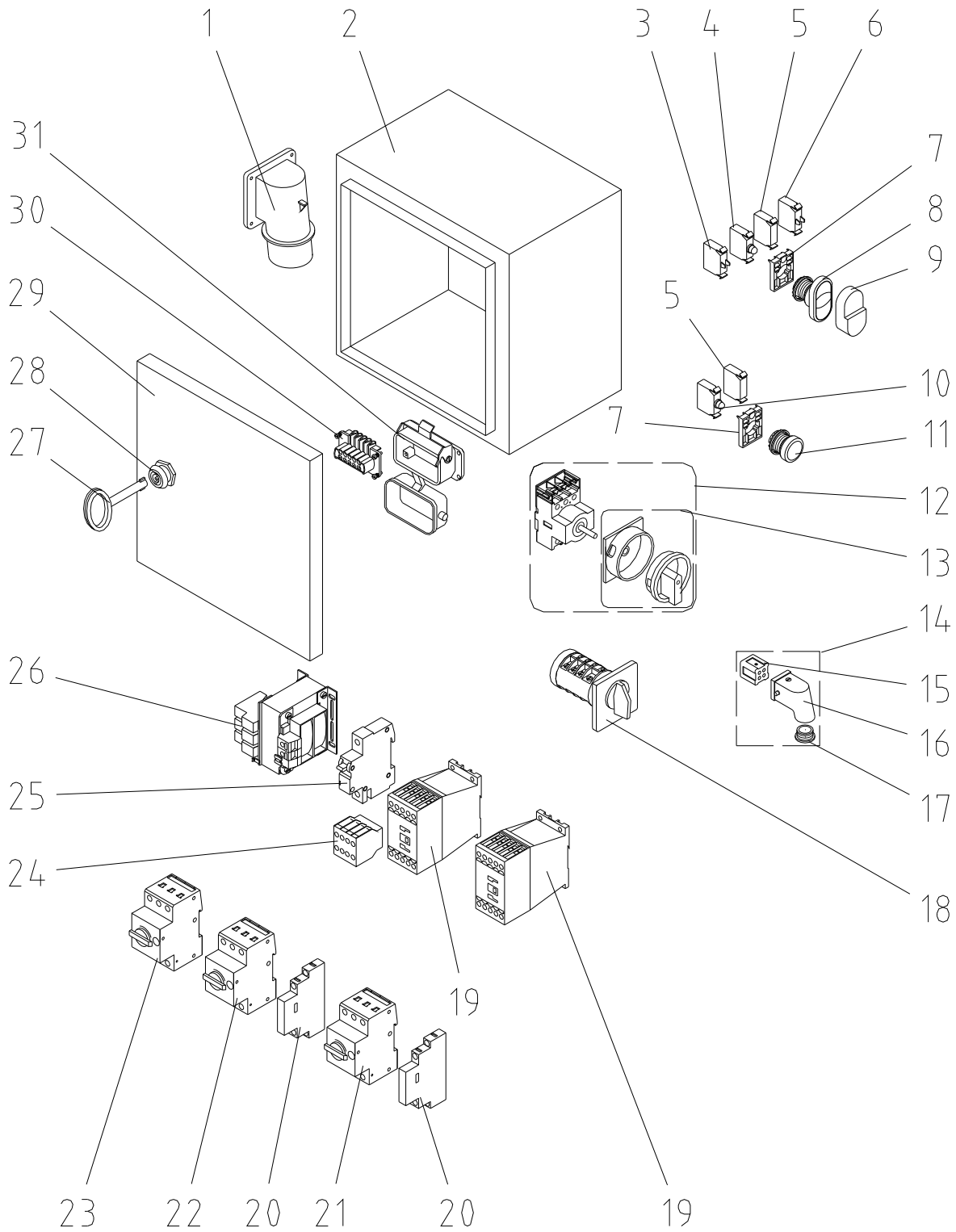


## Spare parts drawings / Spare parts lists

POS	Qty	Article no.	Article description
1	1	00 10 22 28	Mortar pressure gauge 35 mm galvanised cpl.
2	1	00 09 90 88	Gauge with plastic inlet housing 0-100 bar 1/2" pressure reducer VA
3	3	20 20 89 00	Safety nut M12 galvanised
4	3	20 20 88 90	Hex. screw M12 x 85 galvanised
5	1	20 11 40 00	Rotor D4-2/60 SUPER
6	1	20 11 52 00	Stator D4-2 special blue
7	1	20 11 70 00	Clamping ring 255mm D pump 270mm
8	1	00 23 41 41	Tie rod M16 x 330mm (1 set = 2 pieces)
9	2	20 20 99 20	Hex. nut M16 galvanised
10	1	00 04 16 64	Pressure flange D pump G 4 galvanised 1 1/4" FT
11	2	20 20 99 21	Collar nut M16 galvanised
12	1	00 00 17 92	Double nipple 1 1/4" x 60 no. 23 galvanised
13	1	20 20 07 90	Coupling 35 female 1 1/4" int. thread with gasket
14	1	20 20 07 95	Coupling 35 male 1 1/4" int. thread
15	1	00 10 74 58	Coupling 35 female part with 1/2" drilling
16	1	20 20 03 30	Coupling reduction 35/25 male ID 24

## Spare parts drawings / Spare parts lists

### 31.7 Control cabinet BOLERO Art.Nr. 00233296



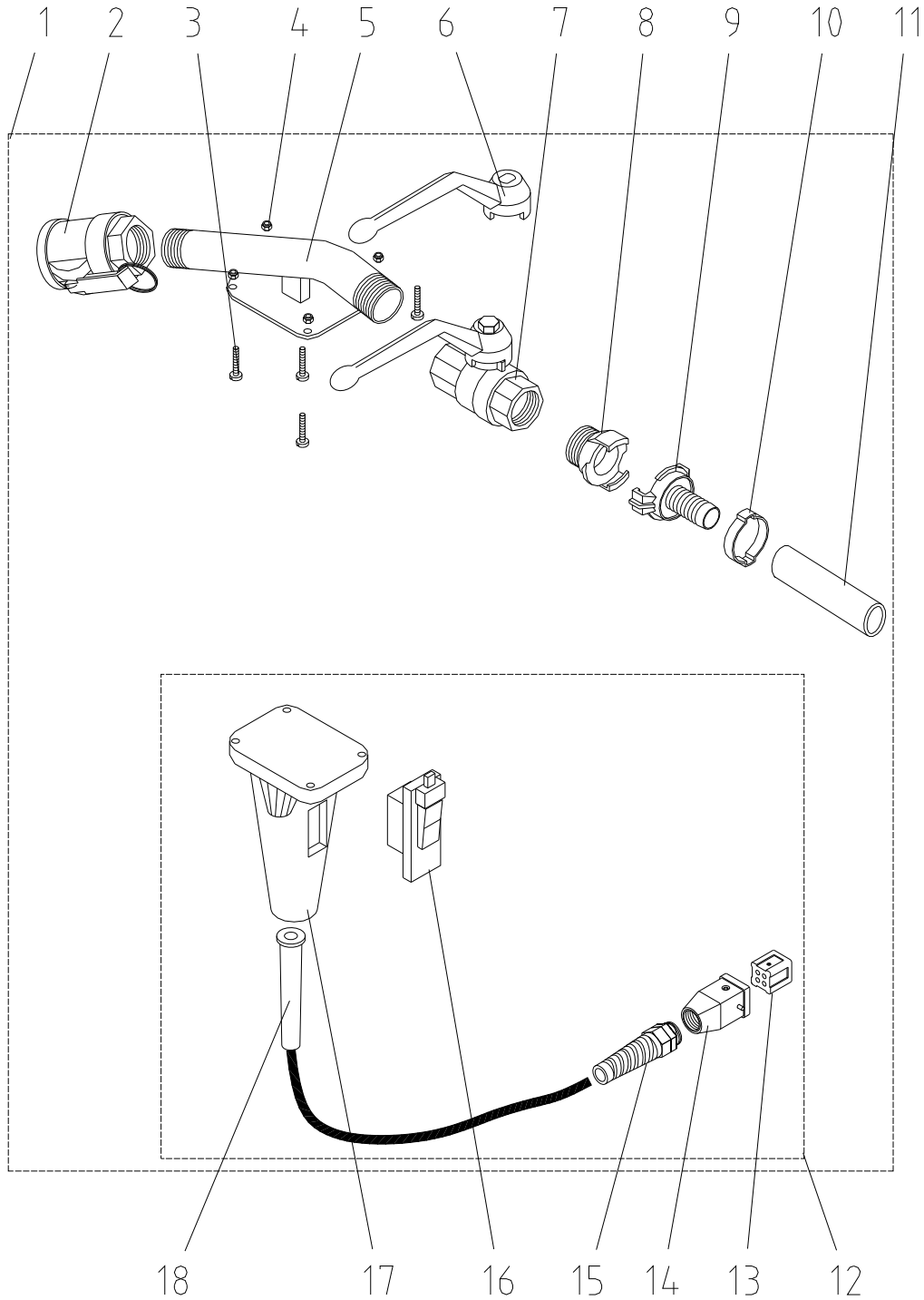


## Spare parts drawings / Spare parts lists

POS	Qty	Article no.	Article description
1	1	20 42 52 00	CEE connection plug 5 x 16A 6h red
2	1	00 23 33 15	Empty housing MS 3 400V 3PH. RAL7035/textured
3	1	00 05 38 36	Contact element 1 opener M22 EK01
4	1	00 05 38 81	Luminous element white 12-30V
5	2	00 05 38 86	LED - resistor - additional series resistor 42 V
6	1	00 05 38 35	Contact element 1 closer M 22 EK 10
7	2	00 05 38 34	Fastening adapter for switch elements
8	1	00 05 38 32	Luminous pushbutton ON/OFF double
9	1	00 05 38 31	Test membrane square for double pushbutton IP 67
10	1	00 05 38 79	Luminous element red 12-30V
11	1	00 05 38 75	Transparent lamp insert cover red M22
12	1	20 45 40 00	Main switch 25A 3 pin
13	1	20 45 40 50	Toggle with ratchet wheel for main switch, lockable
14	1	20 42 85 01	Dummy plug 4 poles, HAN 3A
15	1	20 42 86 06	Male insert 4 pins HAN 3A
16	1	20 42 86 05	Socket housing 4 and 5 pins, angled
17	1	20 43 12 00	Dummy cover PG 11
18	1	00 23 37 69	Pole reversing switch 2 speeds 2 directions of rotation
19	2	00 08 42 24	Air-break contactor DIL M15-10 42 V, 50 Hz 48 V, 60 Hz 7.5kW size I
20	2	00 02 14 01	Auxiliary contactor NHI-11-PKZO
21	1	00 04 58 70	Motor protection switch 4-6.3A PKZM0-6.3
22	1	00 04 26 03	Motor protection switch 2.5-4A PKZM 0-4
23	1	00 04 25 99	Motor protection switch 0.63-1A PKZM 0-1
24	1	00 08 52 93	Auxiliary switch DILM 32-XHI11 1S / 1Ö
25	1	00 23 37 71	Miniature circuit breaker C 2A 1-pin
26	1	00 02 21 74	Transformer 230 V/400V - 42V 70VA without fuses
27	1	20 44 45 00	Key for control cabinet
28	1	00 03 62 49	Lock for control cabinet (double bit)
29	1	00 23 33 22	Door control cabinet MS 3 400V 3Ph. RAL7035/texture
30	1	20 43 22 00	Socket insert 10-pin HAN 10E
31	1	20 43 20 01	Socket housing 10-pin, HAN 10 E

## Spare parts drawings / Spare parts lists

### 31.8 Zargomat- and gluing gun





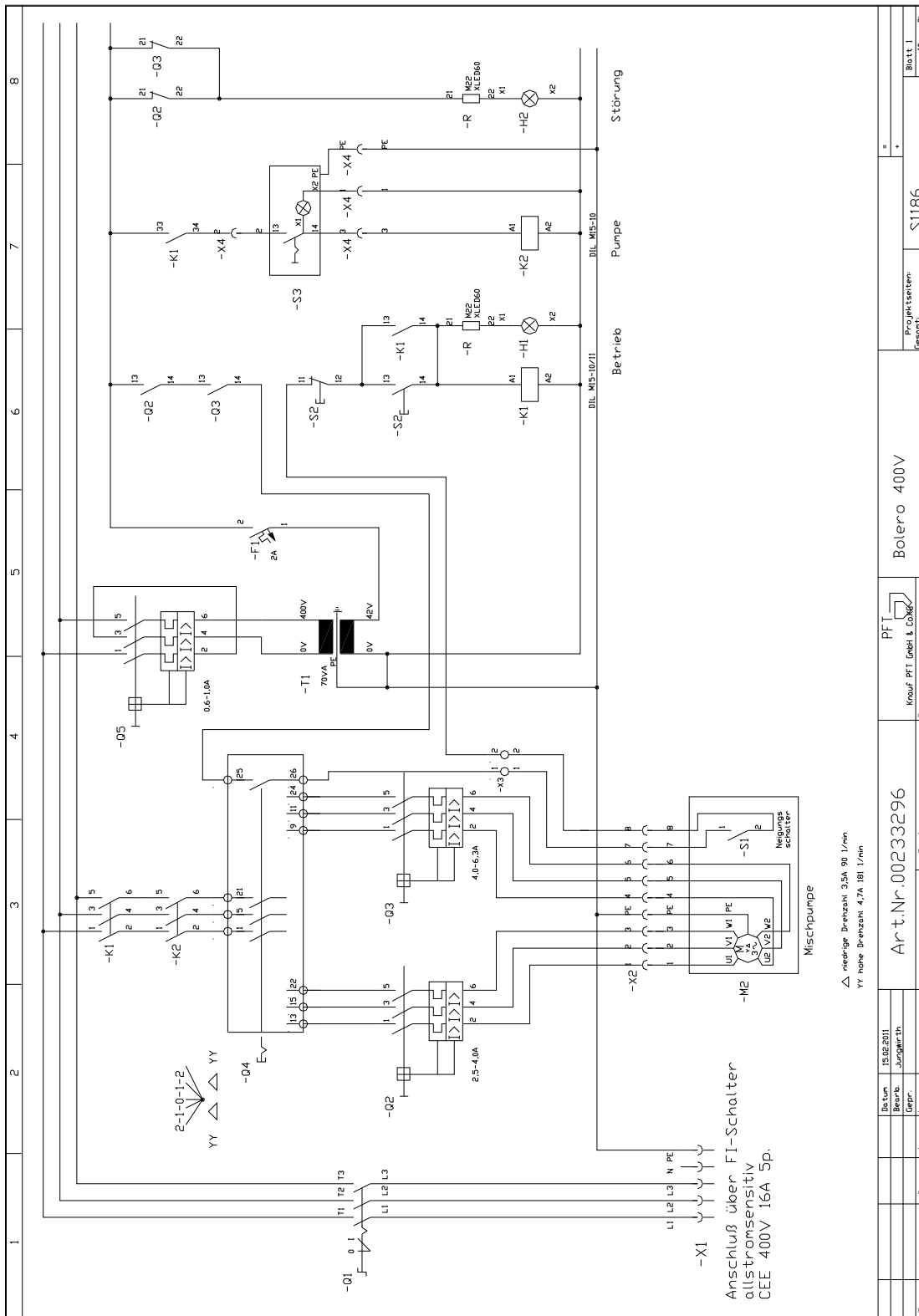
## Spare parts drawings / Spare parts lists

<b>POS</b>	<b>Qty</b>	<b>Article no.</b>	<b>Article description</b>
1	1	20 19 50 00	Zargomat and gluing gun
2	1	20 19 92 00	Coupling 25 female part 1" FT LW24 with gasket
3	4	20 20 64 08	Cylinder head screw M4 x 25 DIN 84 galvanised
4	4	20 20 62 03	Safety nut M4 DIN 985 galvanised
5	1	20 08 90 02	Hanging bracket Zargomat and gluing gun
6	1	20 21 51 54	Hand lever ball valve (20215153)
7	1	20 21 51 53	Ball valve 1" FT DIN 2990 PN 40 with long handle
8	1	20 20 08 00	Geka coupling 1" MT
9	1	20 20 16 00	Geka coupling 3/4" sleeve
10	1	20 20 29 00	Hose clip 28-31 (pack.unit=10 pieces)
11	1	20 21 36 03	Water hose/air hose 3/4" x 150mm
12	1	20 19 50 00	Zargomat and gluing gun with 15m cable
13	1	20 42 86 06	Pin insert 4-pin HAN 3A
14	1	20 42 86 08	Sleeve housing 4 + 5-pin straight
15	1	00 00 15 50	Skintop screw connection PG11 kink protection
16	1	20 26 24 00	Switch
17	1	00 09 64 23	Handle type 2 new model
18	1	20 48 30 01	Cable protection sleeve mixer 1600W
20	1	20 20 08 00	Geka coupling 1" MT
21	1	20 20 17 00	Gasket Geka coupling (pack.unit=50 pieces)

# Circuit diagram S1186



## 32 Circuit diagram S1186



Zust.	Änderung	Da.tun	None	Norm	Berech. Jaggarth	15.02.2011	PFT	Knäuf PFT GmbH & Co. KG	Bolero 400V	Projektsiten Abteilung: S1186	=	Blatt 1 von 10 Bl.
Art.Nr.00233296												





## Checklist for annual expert assessment

### 33 Checklist for annual expert assessment

In accordance with BGR 183 (rules and regulations of the employers' liability insurance association) has to be carried out once a year. A test badge will be attached to the machine and control cabinet as proof of this assessment. The test report has to be shown on demand.

Test date:	Inspector:	Signature:	Machine number:

Component	Test characteristic	ok	Rework/Replacement
Material container	Check all welding seams!		
Material container	Destruction by corrosion or deformation?		
Mixing zone	Check wear of mixing zone!		
Mixing zone	Wear test of the profiles in the mixing zone!		
Mixing zone	Wear test of the drive dog of the pump!		
Drive dog	Wear test of the drive dog!		
Protective grille	Is the surface of the protective grille still even?		
Undercarriage	Check all welding seams!		
Undercarriage	Check all screwed connections for secure fit!		
Undercarriage	Check for warpage! Secure stand has to be guaranteed!		
Castors	Can the castors be turned easily?		
Control cabinet	Visual inspection for visible defects		
Control cabinet	Functional test		
Control cabinet	Are all labels legible?		
Control cabinet	Insulation measurement		
Control cabinet	Functional test of all protection switches!		
Control cabinet	Functional test of all indicator lamps!		
Control cabinet	Check all cable connections for secure fit!		
Name plate	Available and easily legible		
Operating manual	Available		
Mortar pressure gauge	Functional test!		



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