Operating Manual

PFT SCREW MIXER HM 24
Part 2, EC Declaration of Conformity
Overview – Operation – Spare Parts Lists

Article number of operating instructions: 00 01 20 81

HM 24, 400V, 3 phases 60Hz item number 00211876

HM 24, 400 V, 3 phases 60 Hz with AV 1000 and rubber mixing tube item number 00508157

HM 24, 400 V, 3 phases 50 Hz item number 00007874

HM 24, 230 V, 3 phases 60 Hz with rubber mixing tube item number 00265323

HM 24, 400 V, 3 phases 50 Hz with rubber mixing tube item number 00020357

HM 24, 400V with separate mortar outlet flange and dosing shaft 35 l/min item number 00008783

HM 24, 400V, 3 phase, 50Hz with control box for level probe and vibrators item number 00036940

HM 24, 400V, rubber mixing tube / control box / water pressure booster pump item number 00070219

HM 24, 400V, rubber mixing tube, control box, water pressure booster pump item number 00463945

CE

Please read the operating instructions before starting work!

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Table of Contents

Inhaltsverzeichnis

1 EC Declaration of Conformity

Company: Knauf PFT GmbH & Co. KG

Einersheimer Straße 53

97346 Iphofen

Germany

declares under our sole responsibility that the product:

Type of machine:	**HM 24**
Type of equipment:	SCREW 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/EC**).

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:

Diploma in industrial engineering (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

Details of signatory

2 Testing

2.1 Testing by machine operator

- Before the start of each work shift, the machine operator must test the effectiveness of the control and safety devices as well as check the proper attachment of all protective devices.
- During operation, construction machines must be tested by the machine operator for their operational safety.
- If defects are found in the safety devices or any other area that could impair safe operation, the supervisor must be notified immediately.
- For defects posing a hazard to persons, the operation of the construction machine must be halted until the defect is eliminated.

2.2 Periodic inspection

- Construction machines must be tested for safe operation by a specialist as the usage conditions and operating circumstances require, but at least once a year.
- Pressure vessels must undergo the prescribed inspections by authorised experts.
- The inspection results are to be documented and must be stored at least until the next inspection.

3 General notes

3.1 Information about operating instructions

This operating instructions document provides important instructions about handling the device. Compliance with all specified safety instructions and operational directions is a precondition for safe working.

Furthermore, the local accident prevention rules and general safety provisions applicable to the use area of the device must also be observed.

Please go through the operating instructions manual carefully before starting work It is an integral part of the product and must be kept in the immediate vicinity of the device so that it can be accessed easily by the personnel.

If the device is handed over to a third party, please hand over the operating instructions document too.

The figures in this operating instructions document are not necessarily made to scale for better display and may deviate marginally from the actual design of the device.

3.2 Please retain the instructions for later use

The operating instructions must be available during the entire life span of the product.

3.3 Division

The operating instructions consist of two books:

- Part 1 Safety

General safety instructions of mixing/delivery pumps

Article No. 00 14 63 78

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

Both sections must be read and observed for safe operation of the device. They are to be treated as one operating instructions document.

4 Technical data

4.1 General specifications

Item number	Specification	Value	Unit
00211876	Weight	127	kg
00007874	Weight	100	kg
00020357	Weight	107	kg
00008783	Weight	117,5	kg
00036940	Weight	107	kg
00070219	Weight	135	kg
00463945	Weight	134	kg
00265323	Weight	123	kg
	Overall length	1870	mm
	Overall width	670	mm
	Overall height	970	mm
	Container volumev	110	Ltr.

4.2 Electrical 400V

Data	Value	Unit
Voltage, AC 60 Hz	400	V
Voltage, AC 50 Hz	400	V
Current intake, maximum	16	A:
Fuse	Min. 3 x 16	A:

4.3 Operating conditions

Environment

Data	Value	Unit
temperature range	2-45	°C
Relative humidity, maximum	80	%

Duration

Data	Value	Unit
Maximum operating duration on piece	8	Hours

4.4 Noise level

Guaranteed noise level LWA	95dB (A)

4.5 Vibrations

Weighted effective value of acceleration to which the upper body parts are exposed <2,5 m/s²

5 Overview HM 24

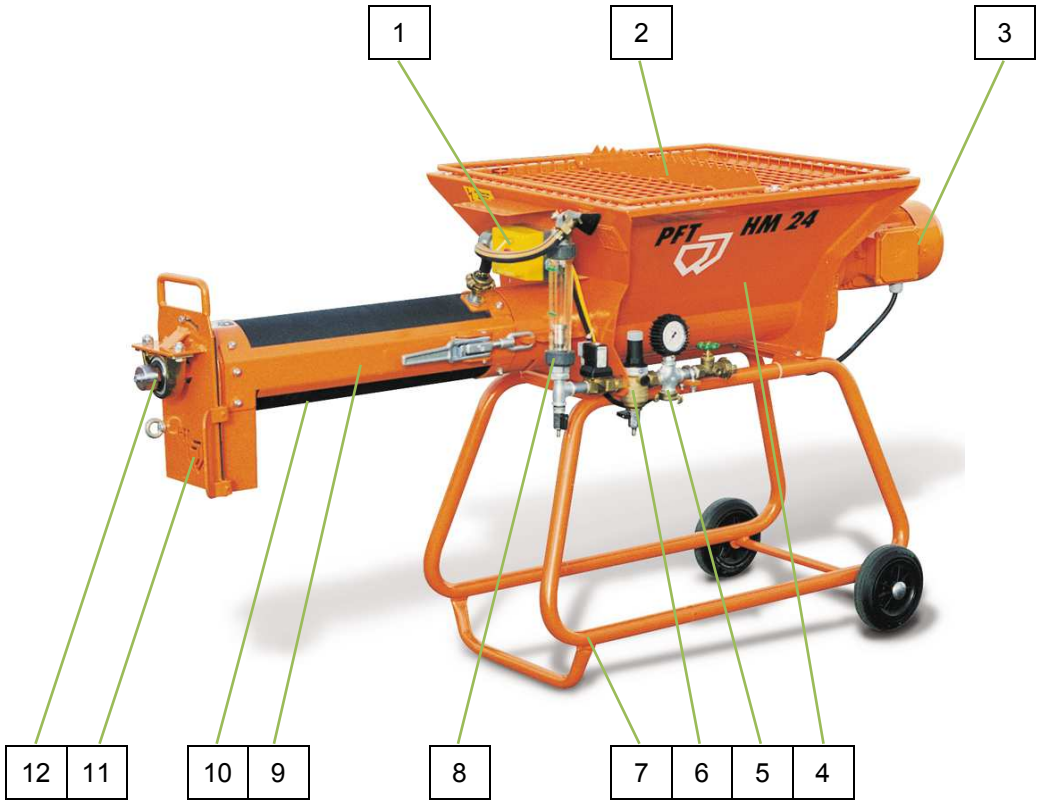
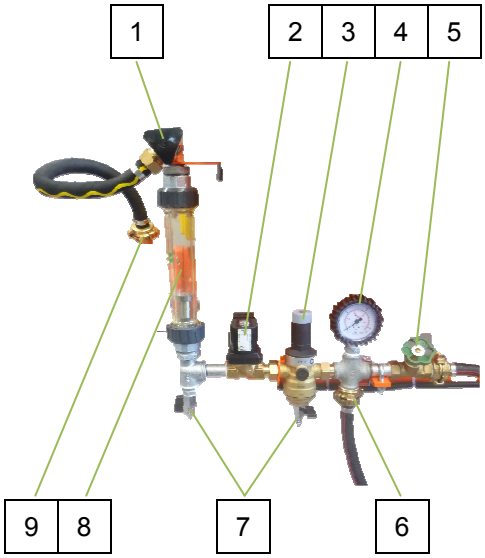


Fig. 1: Overview HM 24

1. ON / OFF switch
2. Protection grille
3. Mixer Motor
4. Material hopper
5. Water input, water connection
6. Water Manifold Unit
7. Frame
8. Water flow meter 100-1000 l/h
9. Mixing tube
10. Rubber mixing tube
11. Mortar outlet flange
12. Bearing

5.1 Water Manifold



1. Needle Valve.
2. Soleniod Valve.
3. Pressure Reducer.
4. Water Pressure Gauge.
5. Water Extraction Valve.
6. Water Mains.
7. Outlet Tap.
8. Water Flow Meter 100-1000 l/h.
9. Water to Mixing Tube.

Fig. 2: Water Manifold

5.2 Water Manifold with Water pressure booster pump

1. Needle Valve.
2. Soleniod Valve I.
3. Pressure reducer.
4. Water Pressure Gauge.
5. Water Extraction Valve.
6. Water Mains.
7. Outlet Tap.
8. Water Flow Meter 100-1000 l/h.
9. Water to Mixing Tube.

Fig. 3: Water Manifold with Water pressure booster pump

6 Type plate

Fig. 4: Type plate

The type plate contains the following information:

- Manufacturer
- Type
- Year built
- Machine number

7 Quality control sticker

Fig. 5: Quality control sticker

The quality control sticker contains the following information:

- CE confirmed in compliance with EU directives
- Serial no. / serial number
- Controlled by / signature
- Date of control

8 Connections

8.1 Connection without control box 400V

Fig. 6: Electrical connection

1. Three-phase current connection (1), 400 V.

8.2 Connection with control box 400V

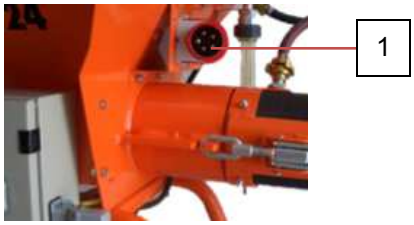


Fig. 7: Electrical connection

1. Three-phase current connection (1), 400 V.

8.3 Connection without control box 230V

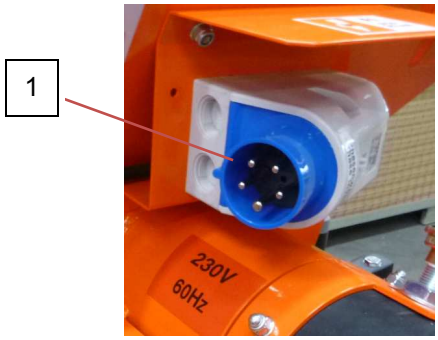


Fig. 8: Electrical connection

2. Three-phase current connection (1), 230 V.

8.4 Connection HM 24 with control box

Fig. 9: Connection control box

1. Operation press button ON - OFF.
2. Blind plug / connector KPS1 probe.
3. Master switch is also emergency-stop switch.
4. Connection water pressure booster pump.
5. Connection geared motor.
6. Connection for vibrating unit.
7. Yellow pilot lamp, for wrong direction of rotation.

9 Description of Functions

PFT's HM 24 is a horizontal continuous screw mixer for factory-blended dry mortars e.g.

- masonry mortar
- outdoor cement plasters (for rendering)
- scratch coat

The PFT HM 24 can be filled either by means of bags, a delivery hood or an injection hood.

The machine consists of individual portable components whose handy dimensions and low weight allow for quick and easy transportation.

NOTE THE FOLLOWING CONNECTIONS WHILE OPERATING:

1. Electrical Panel - Main Switch
2. Water Mains - Water Manifold
3. Water Manifold - Mixing Tube

The PFT HM 24 is a new generation machine based on a modular concept. Use the snaps to remove or fit on various dosing shafts and mixing tubes easily.

FOLLOW ALL MATERIAL MIXING INSTRUCTIONS FROM MORTAR MANUFACTURER!

The following terms and symbols are used in this manual to highlight important information:

NOTE:

Information for running the Machine efficiently.

WARNING!

Precautionary information for the prevention of accidents.

WARNING!

The machine should only be operated in perfect working conditions. Comply with all safety instructions in this manual! Rectify all defects and faults immediately. Proper machine operation includes full compliance with all operating instructions, carrying out specified inspections, and complying with maintenance instructions.

The most important safety instructions follow. **Please read them thoroughly**.

Comply with these instructions in order to get reliable quality service from the machine.

10 Basic Saftey Instructions

1. Follow all safety instructions on the machine. Ensure that all instructions are legible
2. Inspect the machine once every shift for visible damages and defects. Stop operating the machine immediately if you notice any changes in safety or operating behavior. Notify a supervisor immediately.
3. Do not make any changes to the machine that can jeopardize its safety. Always consult the machine dealer first. Do not tamper with the machine by equipping it with extra "safety devices."
4. All spare parts must conform to our technical specifications. Only use spare parts manufactured by PFT.
5. Only trained personnel should operate the machine. Clearly designate all lines of responsibility for operation, equipping maintenance and repairs.
6. Technicians undergoing training in the operation of the machine should be supervised by experienced personnel.
7. Only qualified personnel should work on the machine's electrical system. All electrical work should only take place under the supervision of a qualified electrician and should comply with electro-technical safety regulations.
8. Observe all instructions for switching the machine on and off. Watch display lamps for signals.
9. When the machine is completely switched off for maintenance and repair work, ensure that it cannot switch back on accidentaly. Do this by switching off the main switch,
removing the key or by attaching a warning sign to the main switch.
10. Before cleaning the machine with a water jet, seal all openings that can be damaged through water, e.g. electrical motors and control boxes, thoroughly. After cleaning remove all seals and covers.
11. Use only original fuses with prescribed amps.
12. If work has to be carried out on a voltage-conducting component, a second technician should stand by to switch off mains in case of an emergency.
13. Disconnect the machine from the mains before you move it, even if you are only moving it a short distance. Reconnect the machine to the mains properly before starting up again.
14. Set up the machine on stable ground. Secure it from rolling away or moving during operation.
15. Depressure all conveying systems before dismantling them.
16. Have the machine inspected at once a year by a qualified person. The machine should also be inspected otherwise as required.

11 Safety rules

Caution!

Please observe the regional safety rules for mortar pumping while performing all jobs!

12 Transport, packing and storage

12.1 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.

12.2 Transport inspection

Immediately after receipt, check to ensure that the delivery is complete and free of transport damages.

Proceed as follows if there are externally identifiable transportation damages:

- Do not accept delivery or accept delivery only under reservation.
- Mention the scope of damage on the transport documents or on the delivery receipt of the transport agency.

NOTE:

Complain about each defect as soon as it is detected. Damage claims can be filed only within the valid complaint periods.

Transportation of machine already in operation

DANGER!
Danger of injury through mortar discharge!
Face and eyes can be damaged.

Perform the following steps before transportation:

1. Pull out the main power cable first.
2. Detach all other cable connections.
3. Remove water supply line.
4. Start transportation.

13 Packaging

On packaging

The individual units are packaged in accordance with the expected transport conditions. Environment-friendly materials were used for packaging.

The packaging should protect the individual components from transport damages, corrosion and other damages up to installation. Hence, do not destroy the packaging and remove it only just before installation.

Handling packaging materials

If no return agreement was signed for the packaging, separate the materials according to type and size and channelize them for further use or reuse.

CAUTION!
Environment damages due to incorrect disposal!

Packaging materials are valuable raw materials and can be used further or processed meaningfully and reused in many cases.

Hence:

– Dispose of packaging material in an environment-friendly manner.
– Observe the locally applicable disposal specifications. If necessary, commission a specialized company to perform the disposal.

14 Operation

14.1 Safety

Personal protection equipment

The following protective equipment must be worn while performing all jobs:

- Work safety clothing
- Safety glasses
- Safety 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.

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.

15 Preparing the machine

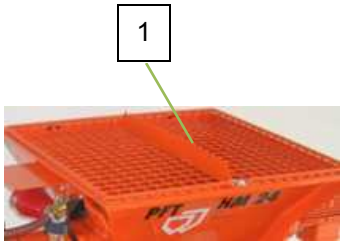


Fig. 10: Grille cover

Fig. 11: 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.

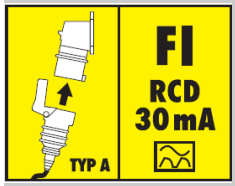
- The operating elements have to be freely accessible.
- Put up the machine on a stable, even surface and secure against unwanted movements:
- Neither tilt nor roll off the machine.
- Put up the machine in such a way that it cannot be hit by falling objects.

16 Connecting the power supply

16.1 Power connection without control cabinet

Fig. 12: Power supply 400 V

1. Connect machine (1) to three-phase network 400V.



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.

16.2 Power connection with control cabinet

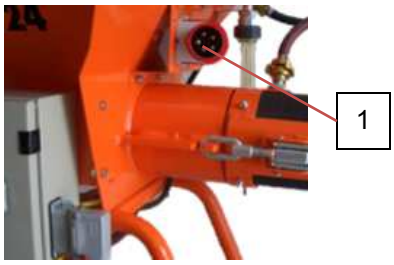
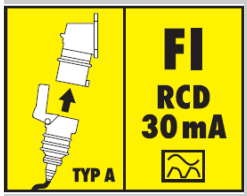


Fig. 13: Power supply 400 V

1. Connect machine (1) to three-phase network 400V.



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.

16.3 Check the individual connectors

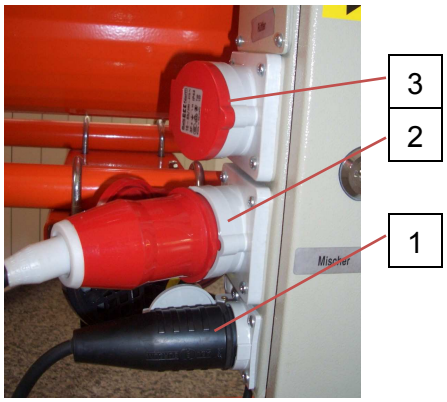


Fig. 14: Power connections

- Connect water pump (1).

NOTE!

The booster pump is necessary should the water pressure be less than 2.5 bar when the machine is running.

- Check connection of mixing motor (2).
- Check connection of Vibrator (3).

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.

17 Check the direction of rotation

17.1 Main switch on the control cabinet

Fig. 15: Main switch

Switch on the main selector switch (1).

HINWEIS!

Check the direction of rotation.

If the direction of rotation is incorrect, the yellow direction indicator (2) lights up and the following steps must be carried out:

The main selector switch (1) is locked in the neutral position by sliding the selector plate to the left or right in a preset position, thus selecting the direction of rotation. If the switch is on the left, the switch can be switched back to zero, but is disabled for the right position.

17.2 On/Off switch with phase inverter

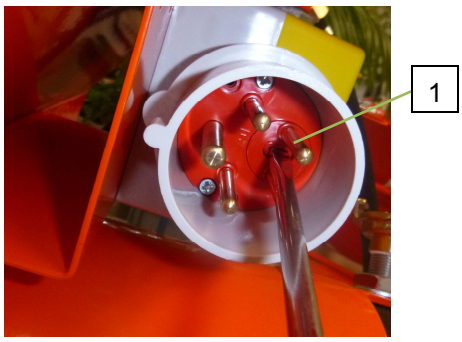


Fig. 16: On/Off switch with phase inverter

Rotating field control:

- All three phases are present and the rotating field is OK: LED green lights up.
- One phase is missing: LED flashes red.
- L1 is missing: LED red flashes 1x (fast).
- L2 is missing: LED red flashes 2x (fast).
- L3 missing: LED red flashes 3x (fast).
- Wrong rotating field: LED red is always lit.

The PFT HM 24 is equipped with a phase display that will light up if the direction of rotation is wrong. With the right phase order, the mixing shaft should rotate clockwise.

The PFT HM 24 is equipped with a contact reversing switch that enables the user to change the direction of rotation.

To do this, disconnect the power cable and alter the contacts with a screw driver (1).

17.3 Connecting the power supply 230 V

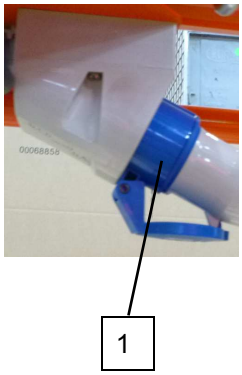
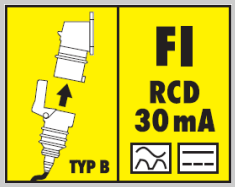


Fig. 17*: Power connection*

1. Connect machine (1) only to a 230V 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 30 mA FI protection switch RCD (residual current operated device) of type “B” that is sensitive to all currents that are required for the operation of frequency converters.

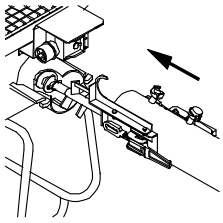
2. Interrupt the control circuit by removing the plugs (2) from the control cabinet.
3. Remove connector Air compressor (3) from control cabinet.

WARNING!
Danger to life from rotating parts!

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

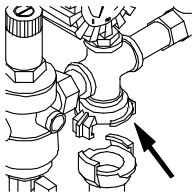
- The respective drive (motors) must be operated only with the control cabinet of the machine.

18 Setting Up the Machine



Assemble the machine as follows:

- Set up the hopper straight
- Insert the mixing shaft into the dosing shaft.
- Mount mixing tube and secure it on the hopper with snaps.
- Attach protection grill.



Water Supply

- Connect a 3/4“ hose to water mains. Open water discharge valve slightly. Let water run through the hose to deaerate and clean it. Wait till water comes out of the hose.
- Shut off water discharge valve.
- Connect water hose to water inlet on the machine (dirt filter).
- Open the water mains. If water pressure is under 2,5 bar, attach water boosterpump AV 3 (Item no. 00 00 11 40) to the mains.

Setting Up the Machine

Caution!

While using stored water from a tank, connect the suction inlet with a filter.

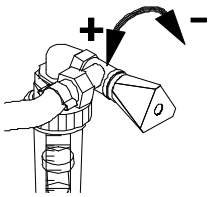
(Item no. 20 47 50 00) (deaerate water pump)

Connect the water hose of the needle valve to the mixing tube.

When the PFT HM 24 has been completely assembled and connected, follow these steps:

- Fill hopper.
- Switch on the HM 24 at main switch.

Regulate the amount of water at the needle valve.



Mortar Consistency

Adjust the needle valve in such a way that the machine emits trowel-suited mortar at the mortar outlet.

NOTE:

Follow all material mixing instructions of the mortar manufacturer!

NOTE:

Interrupting Work!

The length of a break during operation will depend on the material and on the conditions at the construction site (e.g. temperature, humidity etc.)

NOTE:

Follow all material mixing instructions of the mortar manufacturer!

18.1 Water from a water barrel

Booster pump AV3000/1 (1) item number 00493686

The booster pump which is connected ensures the required water pressure of minimum 2.5 bar.

NOTE!

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

19 Putting the machine into operation

19.1 Hazardous dust

WARNING!
Danger of health problems due to dust!
Inhaled dust can lead to long-term lung damage or other health problems.

NOTE!

The machine operator or the person working in the dusty area must always wear a dust mask when filling the machine.

The decisions of the Committee for Hazardous Materials (AGS) can be read in the Technical Rules for Hazardous Substances (TRGS 559).

20 Cleaning

Locking to prevent reactivation

DANGER!
Danger to life from unauthorized reactivation!

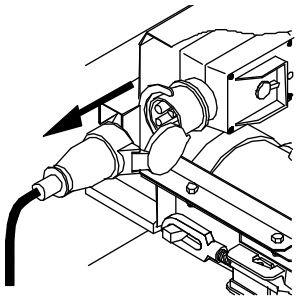
While working at the machine one is exposed to the danger that the power supply may be activated without authorization. This exposes the persons in the danger zone to the risk of death.

– Before starting work, switch off all power supplies and lock them against reactivation.

NOTE:

The machine must be cleaned daily after work and after long pauses.

Connect $^{1}/_{2}$" water hose with Geka coupling (Item no. 20 21 11 00) and spray nozzle (Item no. 20 21 57 00) to water mains.



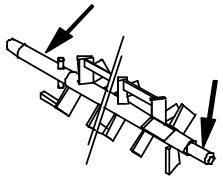
Cleaning should take place in the following 5 steps:

- When the hopper is 1/3 full, reduce the water entry at the needle valve by a quarter. Switch off the PFT HM 24 as soon as highly diluted mortar is discharged.
- Remove the coupling of the power cable before disconnecting the mixing tube, or else the safety hook on the machine will block the coupling.
- Open the snaps on the mixing tube and remove it. Release the mixing shaft and clean it along with the mixing tube. Use a trowel and water for this purpose.
- Clean the hopper on the outside with a brush or dry mop. Use water to clean the hopper only when it is empty.

NOTE:

No water should enter the bearings or electrical parts (plug, main switch, motor connections box).

While assembling cleaned parts, make sure they are really dry and clean. Connect mixing shaft to dosing shaft.



NOTE:

Keep all snaps and seals clean.

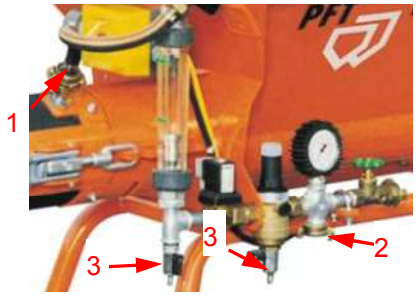
Grease bearing tang and connectors regularly.

21 Measures against danger of frost

CAUTION!
Damage due to frost!

Water that expands inside the machine during frosting can damage it seriously.

– Perform the following steps if the machine is out of operation due to the danger of frost.



1. Remove hose (1) from water connecting piece on the mixing zone.
2. Remove water hose (2) from water inlet.
3. Open the two release cocks (3) on the fittings block.
4. Drain out water and shut the cocks again.

22 Measures during power failure

The PFT HM 24 is equipped with a restart lock. After a power failures switch on the machine at the main switch for operation.

23 Measures for Water Supply Failure

In case of a water supply failure, the PFT HM 24 will keep on running without mixing the material. As soon as the fault is rectified, the HM 24 will mix material quite normally again.

24 Maintenance

24.1 Safety

Personal

- Some maintenance jobs may be performed only by specially trained mechanics or exclusively by the manufacturer.
- Jobs on the electrical system may in principle be performed only by electricians.

Maintenance

Basic

WARNING!
Danger of injury from improperly performed maintenance jobs!

Improper maintenance can lead to serious personal injuries and material damages.

Hence:

– Ensure sufficient installation space before starting work.
– Pay attention to cleanliness and order at the installation site! Components and tools lying loosely on each other or lying scattered are accident sources.
– Ensure correct installation if components are removed, reinstall all fastening elements and screw torques.

Electrical system

DANGER!
Danger to life from electric current!

Contact with electrically live components poses danger to life. Activated electrical components can execute uncontrolled movements and lead to serious injuries.

Hence:

– Before starting work, switch off the power supply and lock the switch against reactivation.

Environment protection

Observe the following instructions on environment protection while performing maintenance jobs:

- Remove discharged, used up or excess grease from all lubrication points that are lubricated manually, and dispose it in accordance with the valid local provisions.
- Collect the replaced oil in suitable containers and dispose according to the valid local provisions.

24.2 Cleaning

- The material container can be cleaned internally with a water hose after being emptied fully.

CAUTION!
Water can penetrate into sensitive machine components!

– Before cleaning the machine, cover all openings into which water should not enter for safety and functional reasons (for example: electric motors and control cabinets).
– Remove the covers fully after the cleaning.

24.3 Maintenance schedule

If increased wear and tear is detected during the regular checks, shorten the required maintenance intervals according to the actual wear and tear.

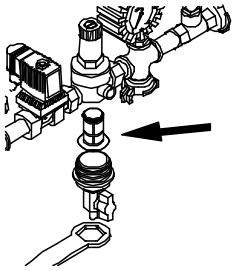
After every operation, check the following parts for defects: bearings, hauling bracket, all connectors, hose connections and power cable connections.

24.4 Dirt trapping sieve

Check dirt trapping sieve in the water inlet daily:

1. Take out dirt trapping sieve from the Geka coupling.
2. Clean dirt trapping sieve.
3. Replace sieve if there are thick dirt deposits.
4. Reinsert dirt trapping sieve.

Dirt trapping sieve Geka coupling: Article No. 20152000



Remove and clean the dirt filter in the water inlet and in the pressure reducer at least once every two weeks. Replace them, if necessary. Open filter holder with special spanner (Item no. 20 10 24 00).

25 Dismantling

On reaching the end of its life span, the device must be dismantled and disposed in an environment-friendly manner.

25.1 Safety

Personal

- The device is to be dismantled only by specially trained technicians.
- Jobs on the electrical system may be performed only by electricians.

Basics

WARNING!
Risk of injury from improper dismantling!

Stored residual energies, sharp-edged components, tips and corners on or in the device or on the required tools can cause injuries.

Hence:

– Ensure sufficient free space before starting work.
– Handle open sharp-edged components carefully.
– Pay attention to cleanliness and order at the workplace! Components and tools lying loosely on each other or lying scattered are accident sources.
– Dismantle components properly. Consider the partially high dead weight of the components. Use lifting tools if necessary.
– Lock components so that they do not fall down or topple over.
– Contact the manufacturer in case of doubt.

Electrical system

DANGER!
Danger to life from electric current!

Contact with electrically live components poses danger to life. Activated electrical components can execute uncontrolled movements and lead to serious injuries.

Hence:

– Switch off and cut the power supply permanently before starting the dismantling operation.

25.2 Dismantling

For selection, clean the device and take it apart according to the valid work safety and environment protection specifications.

Before start of dismantling:

- Switch off device and lock it against reactivation.
- Cut total power supply from device physically, discharge stored residual energies.
- Remove operating and auxiliary substances as well as remaining processing materials and dispose of them in an environment-friendly manner.

25.3 Disposal

Recycle the dismantled components if no return- or disposal agreement was signed:

- Scrap metals.
- Recycle plastic elements.
- Dispose of the remaining components sorted by material quality.

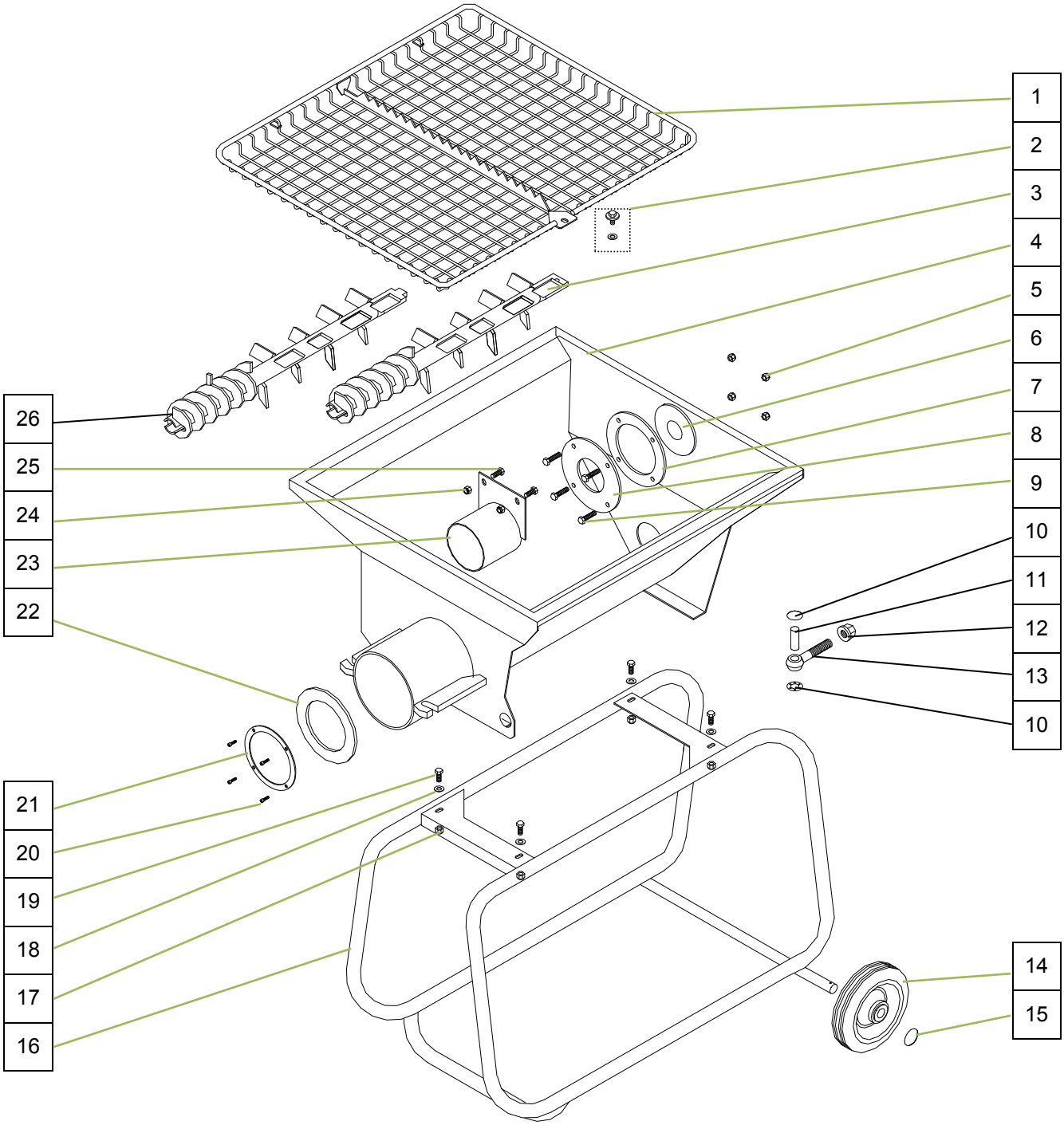
CAUTION!
Environmental damages due to incorrect disposal!

Electrical scrap, electronic components, lubricants and other auxiliary substances are subject to special waste treatment, and may be disposed only by certified specialized companies!

The local municipal authorities or specialized disposal companies provide information about environment-friendly disposal.

26 Spare parts drawing

26.1 Hopper with Frame Unit



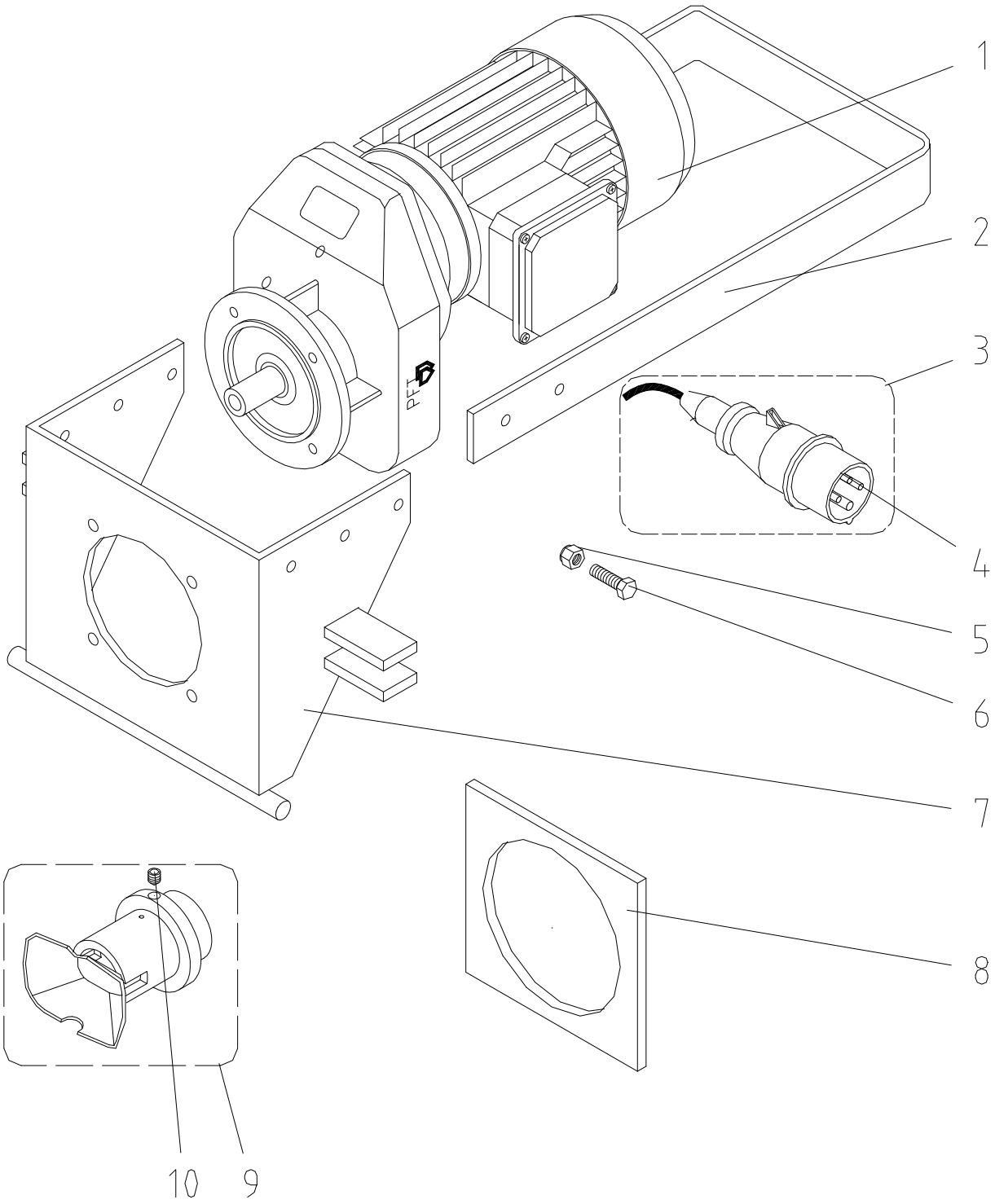
26.2 Spare parts list Hopper with Frame Unit

Item	Qty.	Art.No.	Description
1	1	00 00 21 13	Protection grill with rounded frame
2	1	00 21 45 19	Securing disk and saucer head screw M8x25 cpl.
3	1	00 00 25 69	Dosing shaft HM 22/24 35l at 280rpm
4	1	00 00 21 12	Material hopper HM 22/24 RAL2004
	1	00 02 05 81	Material hopper HM 22/24 removable motor flange 2004
5	4	20 20 72 00	Safety nut M 8 galv.
6	1	20 54 57 02	Sealing ring for drive D 107x40x5
7	1	00 25 15 80	Seal ring for gear sealing D160x110x4
8	1	20 54 57 05	Clamping flange for rubber seal HM
9	4	20 20 78 01	Hex. screw M8 x 35 galv.
10	4	20 20 86 04	Quick fastener with cap 16s x N 2 7 (packing unit = 10 pcs)
11	2	20 70 58 02	Bolt A16 H11 x 50
12	2	20 20 99 21	Collar nut M16
13	2	20 20 85 00	Eye screw M16 x 80, galvanised
14	2	20 54 83 10	Wheel 180 x 50 x 90
15	2	20 20 86 03	Fastener with cap 20s x N 2 7
16	1	00 00 78 76	Frame HM 22/24 (1") RAL2004
17	1	20 20 72 00	Safety nut M 8 galv.
18	4	20 20 93 13	Washer B 8,4 galv.
19	4	20 20 87 01	Hex. screw M8 x 16 galv.
20	4	20 20 96 11	Screw with inner thread. M4 x 12 galv.
21	1	20 54 95 15	Clamping flange for mixing tube seal HM 2/200/2002
22	1	20 54 80 10	Rubber seal D154 X D107 X 5
23	1	20 54 71 03	Dosing wear-tube HM 200/2002 D102 x 151
24	2	20 20 72 00	Safety nut M 8 galv.
25	2	20 20 78 10	Hex. screw M8 x 25 galv.
26	1	00 04 07 21	Dosing shaft HM 104 35l at 280 rpm

For spare parts orders only with specification of the type plate!

Spare parts drawing

26.3 Drive Unit Art.No. 00211876



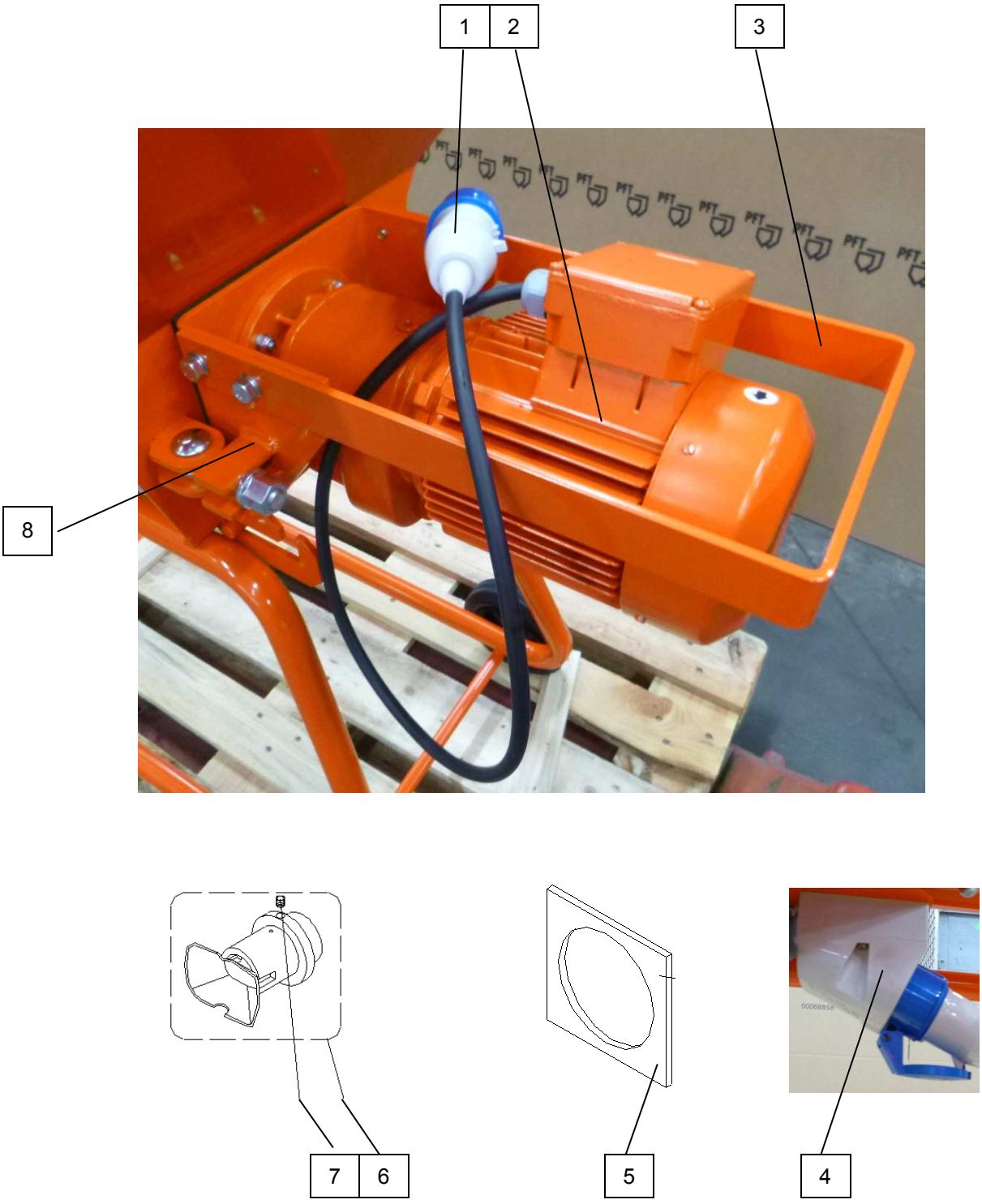
26.4 Spare parts list Drive Unit Art.No. 00211876

Item	Qty.	Art.No.	Description
1	1	00 42 92 99	Geared motor ZF21 3kw 274rpm RAL2004
2	1	00 01 01 61	Protection bail for motor adjustable for HM 202/204 RAL2004
3	1	20 42 41 10	Motor connection cable 0,85m CEE plug 4x 16A 6h red loop 4mm
4	1	20 42 79 00	Plug CEE 4 x 16A 6h red
5	4	20 20 72 00	Safety nut M 8 galv.
6	4	20 20 78 10	Hex. screw M8 x 25 galv.
7	1	00 01 01 60	Motor flange without protection bail HM 202/204 RAL2004
8	1	20 54 80 20	Gasket 200 x 190 x 10 D160
9	1	20 10 29 11	Hauling bracket with round funnel 25 mm boring HM 2/HM 200
10	1	20 20 96 03	Threaded pin hex. M8 x 20 galv.

For spare parts orders only with specification of the type plate!

Spare parts drawing

26.5 Drive Unit 60Hz Art.No. 00265323



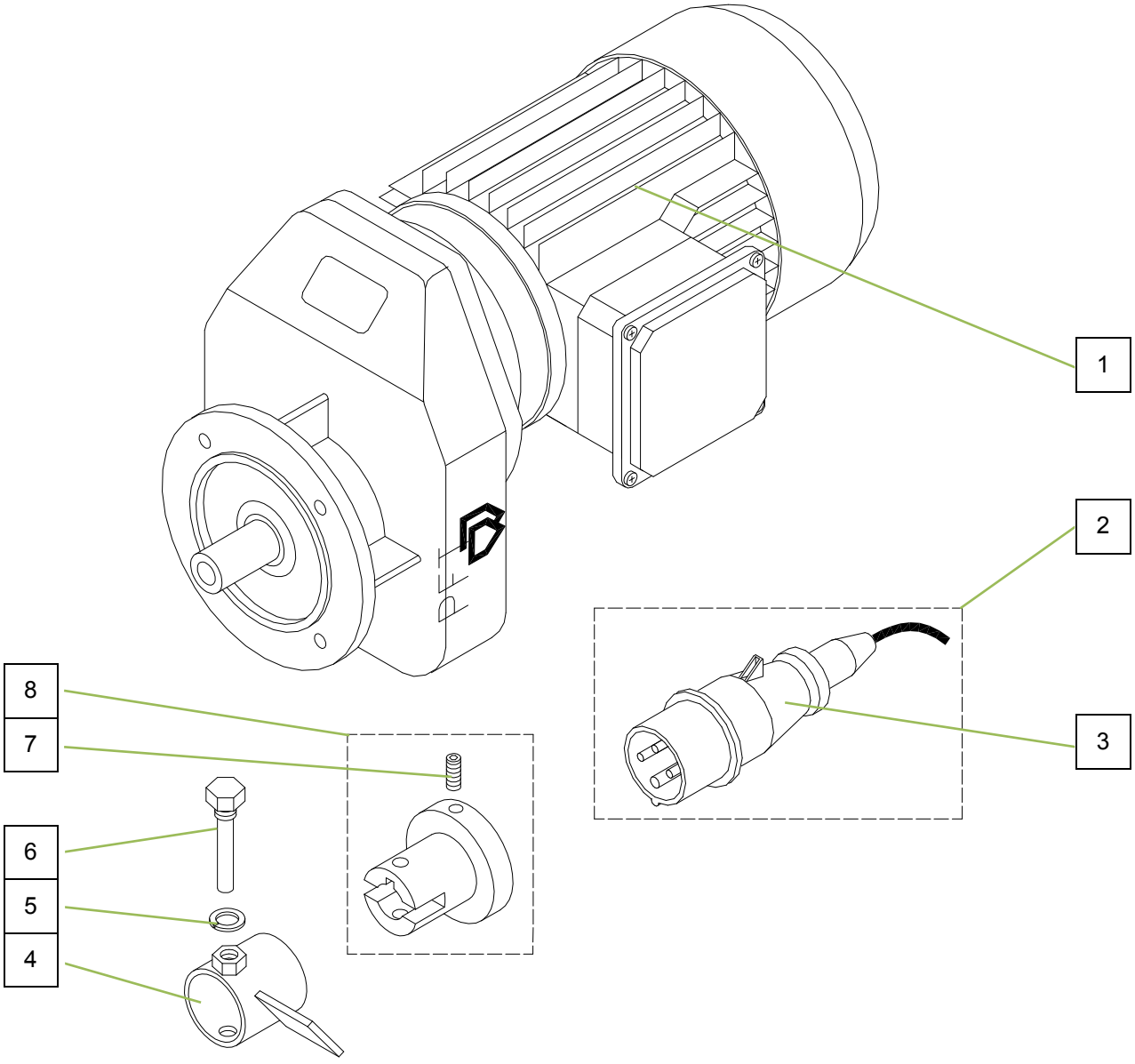
26.6 Spare parts list Drive Unit Art.No. 00265323

Item	Qty.	Art.No.	Description
1	1	20 42 79 01	Plug CEE 4 x 16A 9h blue
	1	00 06 62 83	Motor connection cable CEE 4 x 16A - 1.2 m cpl.
2	1	00 42 92 99	Geared motor ZF21 3kw 274rpm RAL2004
3	1	00 01 01 61	Protection bail for motor adjustable for HM 202/204 RAL2004
4	1	00 02 20 86	CEE-Panel mounted socket 4 x 16A 9h blue
5	1	20 54 80 20	Gasket 200 x 190 x 10 D160
6	1	20 10 29 11	Hauling bracket with round funnel 25 mm boring HM 2/HM 200
7	1	20 20 96 03	Threaded pin hex. M8 x 20 galv.
8	1	00 01 01 60	Motor flange without protection bail HM 24 RAL2004

For spare parts orders only with specification of the type plate!

Spare parts drawing

26.7 Drive Unit



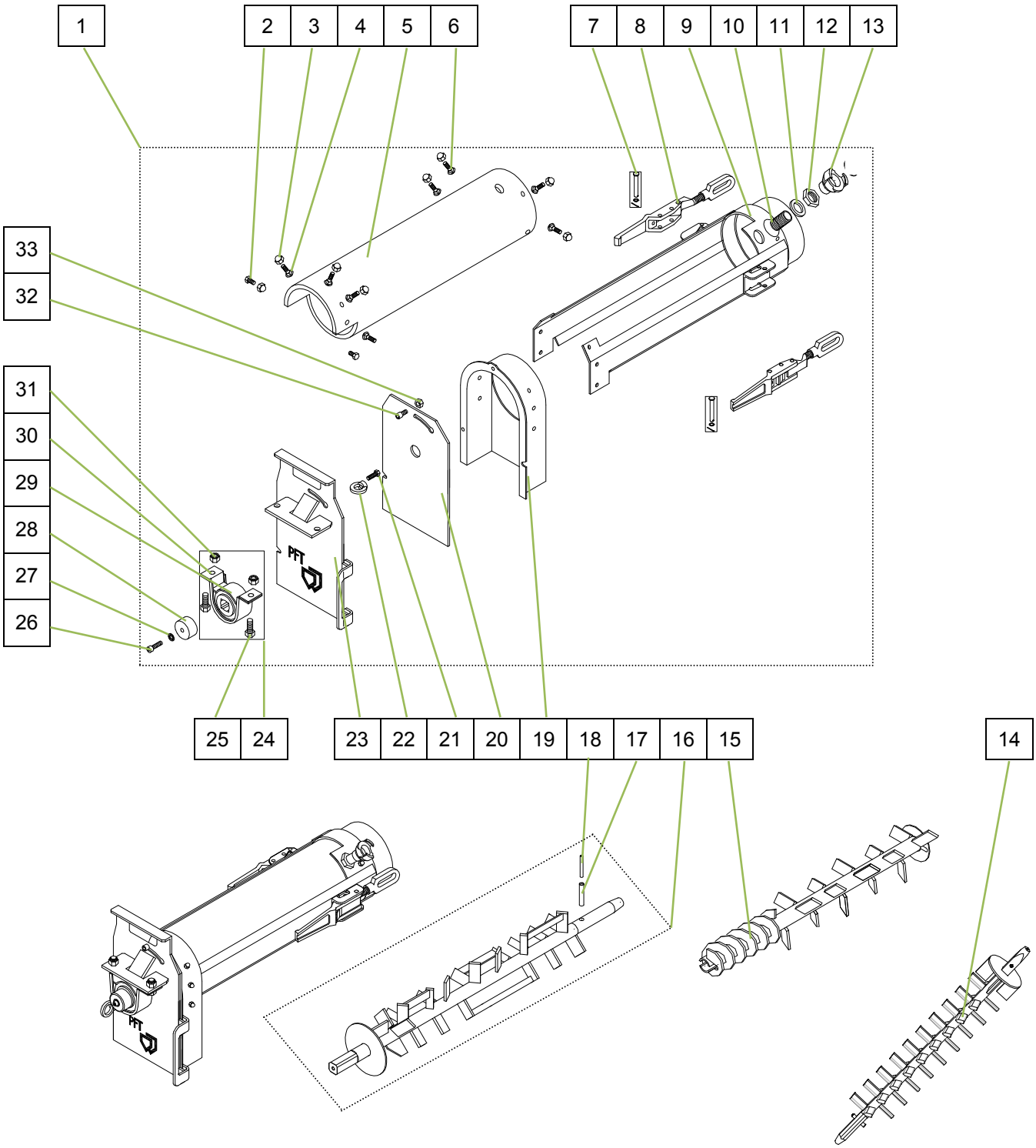
26.8 Spare parts list Drive Unit

Item	Qty.	Art.No.	Description
1	1	00 42 92 99	Geared motor ZF21 3kw 274rpm RAL2004
2	1	20 42 41 10	Motor connection cable 0,85m CEE plug 4x 16A 6h red loop 4mm
3	1	20 42 79 00	Plug CEE 4 x 16A 6h red
4	1	00 00 21 10	Cover with flap HM 22/24
5	1	20 20 91 10	Spring washer B 12 galv.
6	1	00 00 81 49	Hex. screw M12 X 60 modified stainless
7	1	20 20 96 03	Threaded pin hex. socket. M8 x 20 galv.
8	1	00 13 98 10	Hauling bracket Hm 22 / 24 galv. cpl.

For spare parts orders only with specification of the type plate!

Spare parts drawing

26.9 Mixing Tube Unit Art.No. 00012594



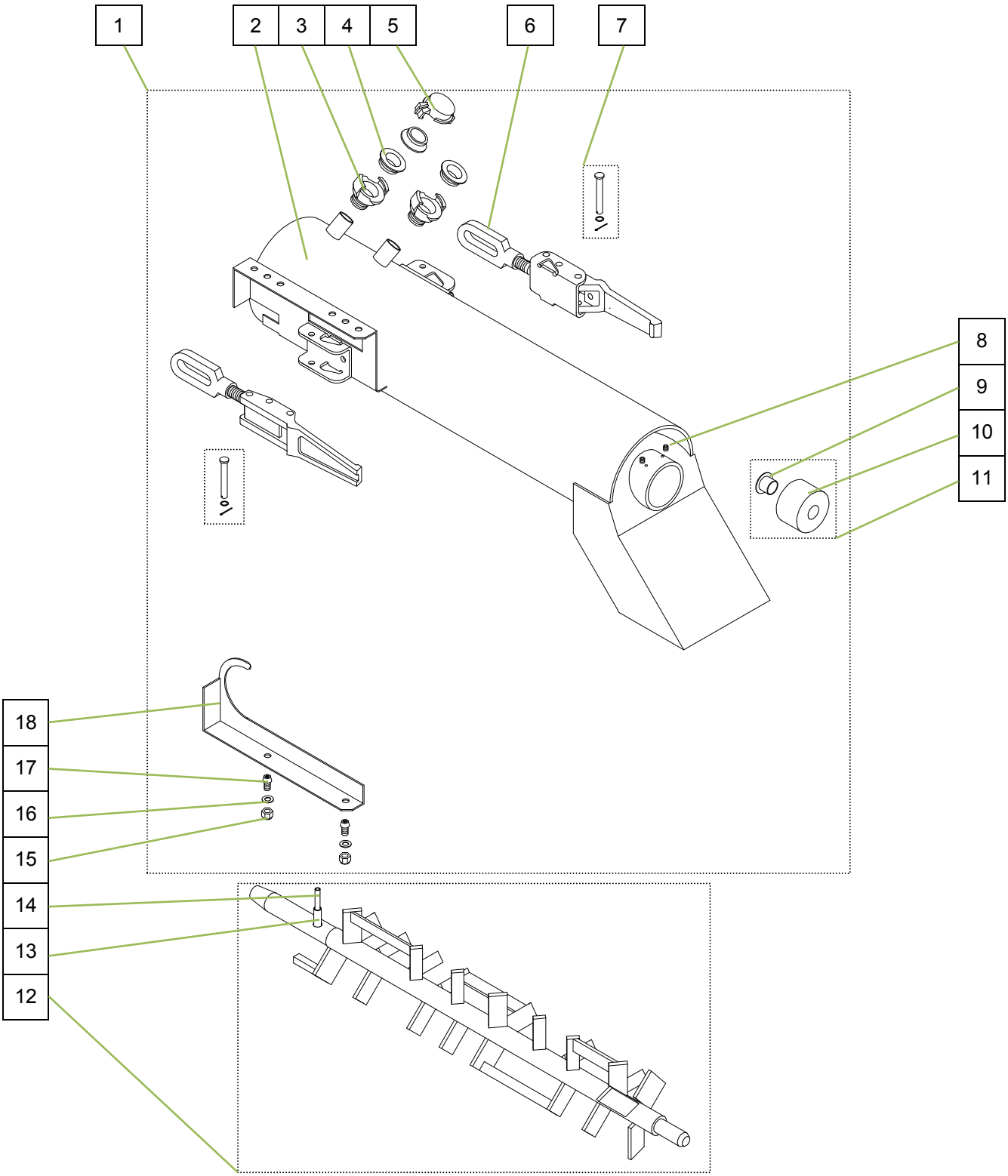
26.10 Spare parts list Mixing Tube Unit Art.No. 00012594

Item	Qty.	Art.No.	Description
1	1	00 01 25 94	Mixing tube HM 2 with rubber mixing zone and fixed mortar output flange RAL2004
2	2	20 20 87 01	Hex. screw M8 x 16 galv.
3	10	20 20 66 03	Safety nut M8 galv.
4	1	20 20 63 23	Saucer-head screw M8 x 25 galv.
5	1	00 01 25 93	Rubber mixing tube HM 104/204 620mm long coped
6	4	20 20 63 23	Saucer-head screw M8 x 25 galv.
7	2	20 20 85 22	Pin 8 H11 x 58 x 54 with washer and spline galv.
8	2	20 10 08 01	Snap lock with safety device M14
9	1	00 01 25 91	Flange for rubber mixing tube HM 2 with fixed mortar output
10	1	00 00 22 29	Water inlet for ruber mixing tube HM 2
11	1	20 20 93 15	Washer
12	1	00 00 28 11	Nut 1/2" int. thread
13	1	20 20 13 00	Geka coupling 1/2" int. thread
14	1	00 43 11 98	Sprocket mixing shaft HM 104 4 rows RAL2004 (Art.Nr. 00070219)
15	1	00 00 25 69	Dosing shaft HM 22/24 35l at 280rpm
16	1	00 02 14 95	Mixing shaft HM 2002 (3 levels)
17	1	20 54 76 00	Dowel pin 10 x 40
18	1	20 54 76 03	Dowel pin 6 x 40
19	1	00 01 25 92	Mortar output flange fixed to rubber mixing tube HM 2 RAL2004
20	1	00 01 94 21	Rubber front plate for mortar output flange
21	1	20 20 78 00	Hex. screw M8 x 30 galv.
22	1	20 20 79 50	Ring nut M8 galv.
23	1	00 01 94 20	Front plate for mortar output flange RAL2004
24	1	20 54 55 01	Bearing with square bore and housing
25	2	20 20 99 63	Hex. screw M12 x 25 galv.
26	1	00 02 04 09	Cylindrical screw M8 x 25
27	1	20 20 93 14	Washer A 8,4 galv.
28	1	20 54 54 09	Locking disc for HM galv.
29	1	20 54 55 06	Bearing with square bore
30	1	00 04 13 96	Housing for bearing Y-P 80
31	2	20 20 89 00	Safety nut M12 galv.
32	1	20 20 97 11	Hex. socket head screw M8 x 20 galv.
33	1	20 20 64 00	Hex. nut M8 galv.

For spare parts orders only with specification of the type plate!

Spare parts drawing

26.11 Mixing Tube Unit HM22/24 Art.No. 00002116



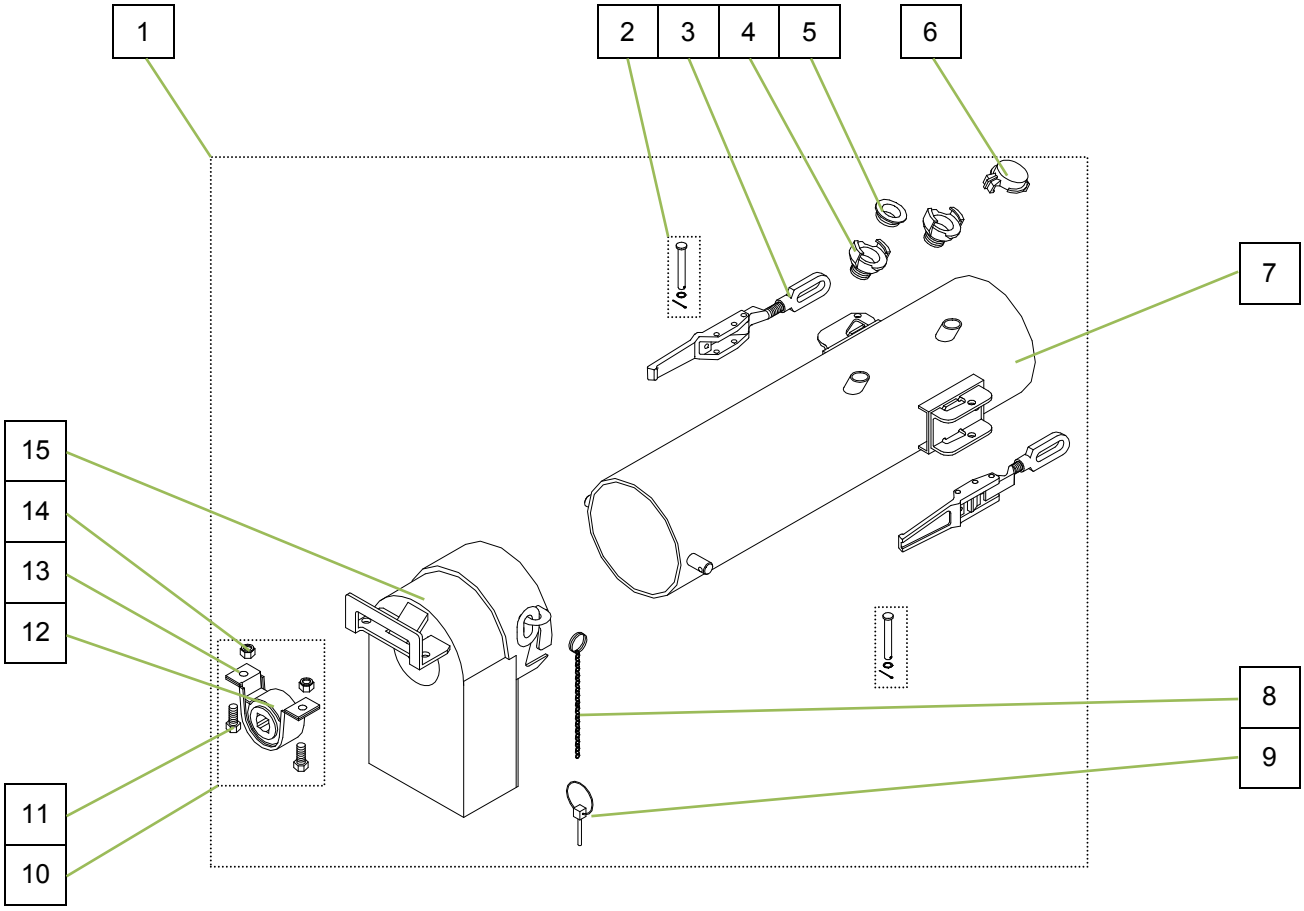
26.12 Spare parts list Mixing Tube Unit Art.No. 00002116

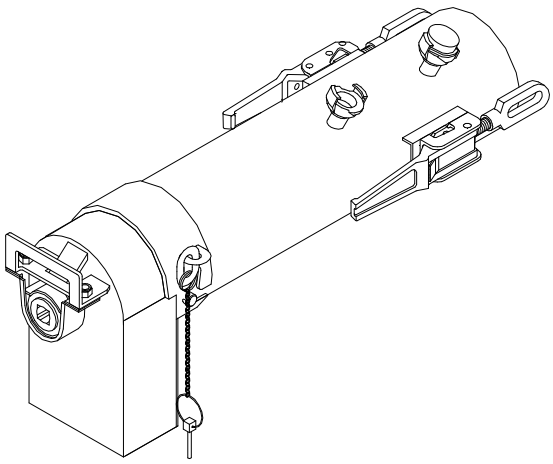
Item	Qty.	Art.No.	Description
1	1	00 00 21 16	Mixing tube HM 22/24 cpl.
2	1	00 00 21 17	Mixing tube HM 22/24
3	2	20 20 09 00	Geka coupling 1/2" ext. thread (packing unit = 10 pcs)
4	3	20 20 17 00	Gasket Geka-coupling (packing unit = 50 pieces)
5	1	20 20 16 50	Geka coupling dummy cover
6	2	20 10 08 01	Snap lock with safety device M14
7	2	20 20 85 22	Pin 8 H11 x 58 x 54 with washer and spline galv.
8	2	20 20 99 92	Threaded pin hex.socket M6 x 6 galv.
9	1	20 02 60 01	Glide bearing with insert
10	1	20 02 60 02	Bearing bushing Thermoplast D60 x 40
11	1	20 54 82 10	Bearing bush HM 2/2000/2002 with bushing
12	1	00 01 99 67	Mixing shaft HM 2/22/24/2002 with scraper
13	1	20 54 76 00	Dowel pin 10 x 40
14	1	20 54 76 03	Dowel pin 6 x 40
15	2	20 20 72 00	Safety nut M 8 galv.
16	2	20 20 93 13	Washer B 8,4 galv.
17	2	00 00 86 14	Security-screw, buttonhead with socket and flat M8 x 16 A2
18	1	00 00 71 52	Safety hook for CEE plug RAL2004

For spare parts orders only with specification of the type plate!

Spare parts drawing

26.13 Mixing Tube Unit Art.No. 20548520





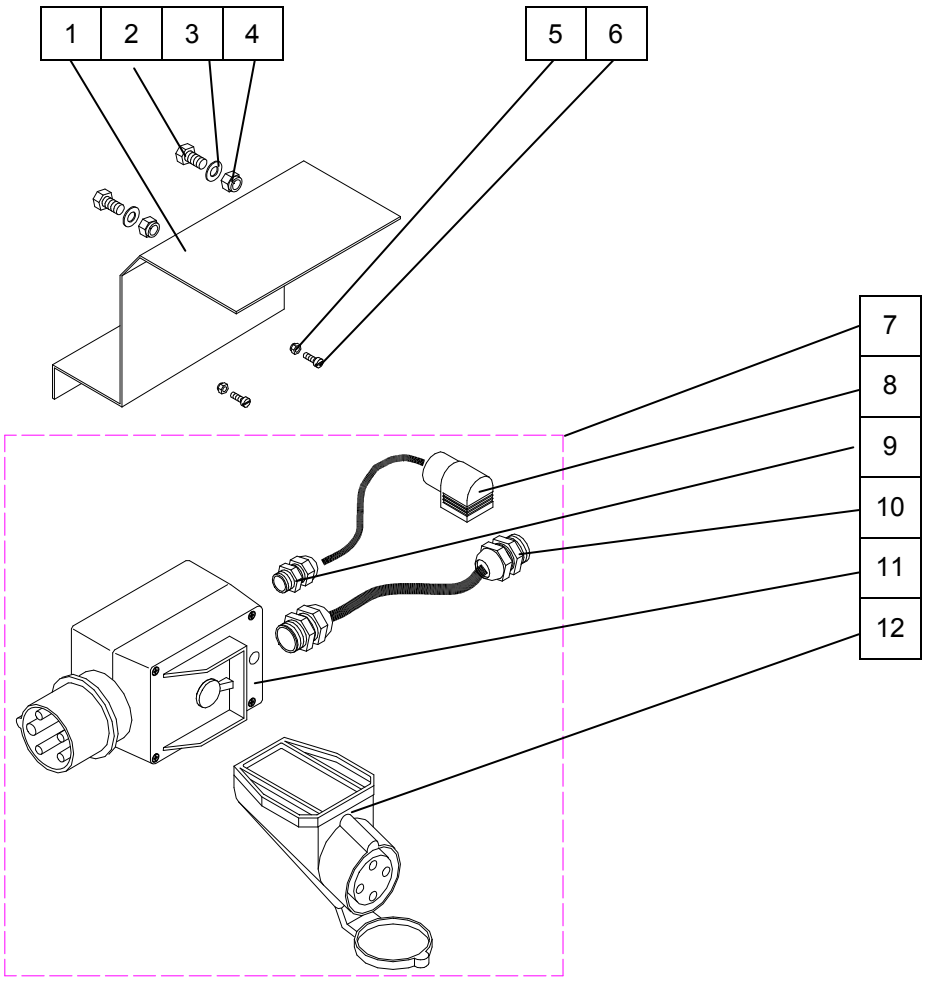
26.14 Spare parts list Mixing Tube Unit Art.No. 20548520

Item	Qty.	Art.No.	Description
1	1	20 54 85 20	Mixing tube HM 2/200/2002 cpl.
2	2	20 20 85 22	Pin 8 H11 x 58 x 54 with washer and spline galv.
3	2	20 10 08 01	Snap lock with safety device M14
4	2	20 20 09 00	Geka coupling 1/2" ext. thread (packing unit = 10 pcs)
5	1	20 20 17 00	Gasket Geka-coupling (packing unit = 50 pieces)
6	1	20 20 16 50	Geka coupling dummy cover
7	1	20 54 81 05	Mixing tube HM 2/200/2002 RAL2004
8	1	20 55 29 10	Safety chain 2mm 250mm long K20
9	1	20 10 10 10	Splint D 4,5 with ring
10	1	20 54 55 01	Bearing with square bore and housing
11	2	20 20 68 01	Hex. screw M12 x 30 galv.
12	1	20 54 55 06	Bearing with square bore
13	1	00 04 13 96	Housing for bearing Y-P 80
14	2	20 20 89 00	Safety nut M12 galv.
15	1	20 54 81 03	Mortar outlet flange removable HM 2/200/2002 RAL2004

For spare parts orders only with specification of the type plate!

Spare parts drawing

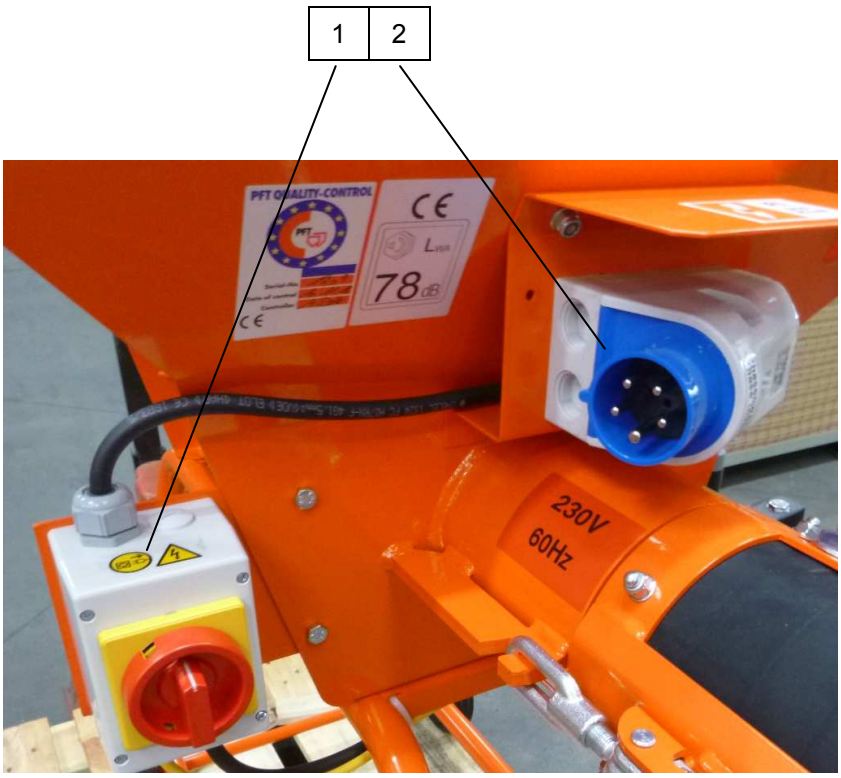
26.15 Electrical Unit 400V 60Hz



26.16 Spare parts list Electrical Unit 400V 60Hz

Item	Qty.	Art.No.	Description
1	1	00 00 71 53	Support for mounted plug HM 22/24/2002
2	2	20 20 61 00	Hex. screw M8 x 20 galv.
3	2	20 20 93 13	U disc B 8,4 galv.
4	2	20 20 72 00	Nut M8 galv.
5	2	20 20 62 03	Nut M4 galv.
6	2	20 20 63 05	Cylindrical screw M4 x 12 galv.
7	1	00 21 24 19	Cable set HM24 400V 60Hz
8	1	00 45 64 61	Plug solenoid valve 400V 50/60Hz
9	1	00 04 11 41	Skintop screwed joint M16 x 1,5
10	2	00 04 11 42	Skintop screwed joint M25 x 1,5
11	1	00 21 18 78	On/Off switch with phase changing device 6.5-10A 60Hz
12	1	00 02 20 73	CEE-Socket 4 x 16A 6h red

26.17 Electrical Unit 230V 60Hz

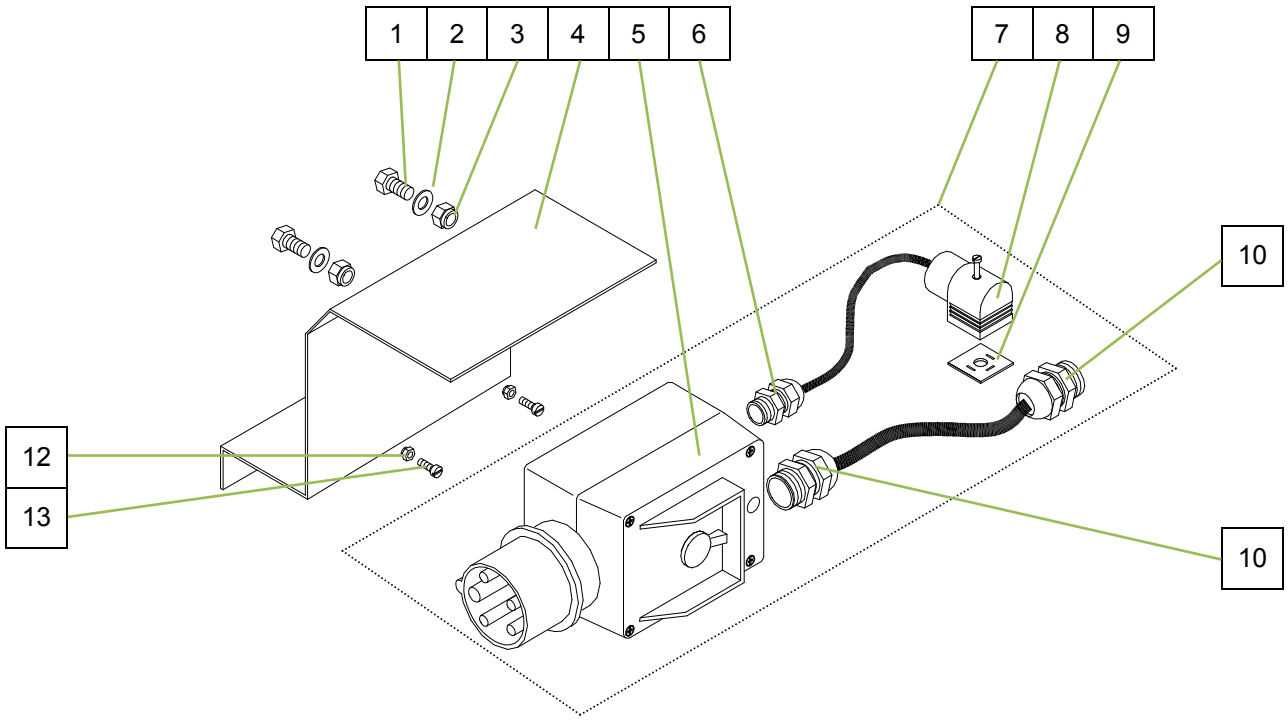


Item	Qty.	Art.No.	Description
1	1	20 45 69 46	On/Off switch with motor protection 10-16 A, 230 V, 60 Hz
2	1	00 02 20 80	CEE connection plug, phase inverter 5 x 16A 9h, blue

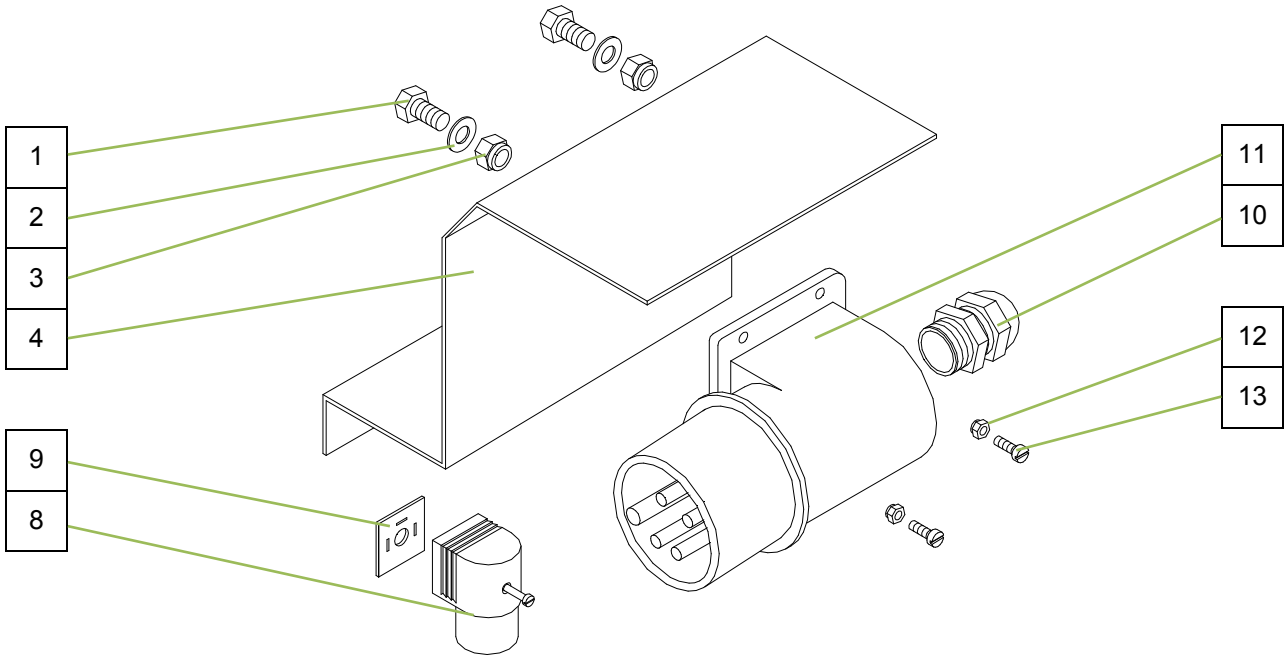
For spare parts orders only with specification of the type plate!

Spare parts drawing

26.18 Cable set HM 24 Art.No. 00002127



26.19 Support for mounted plug HM 22/24/2002



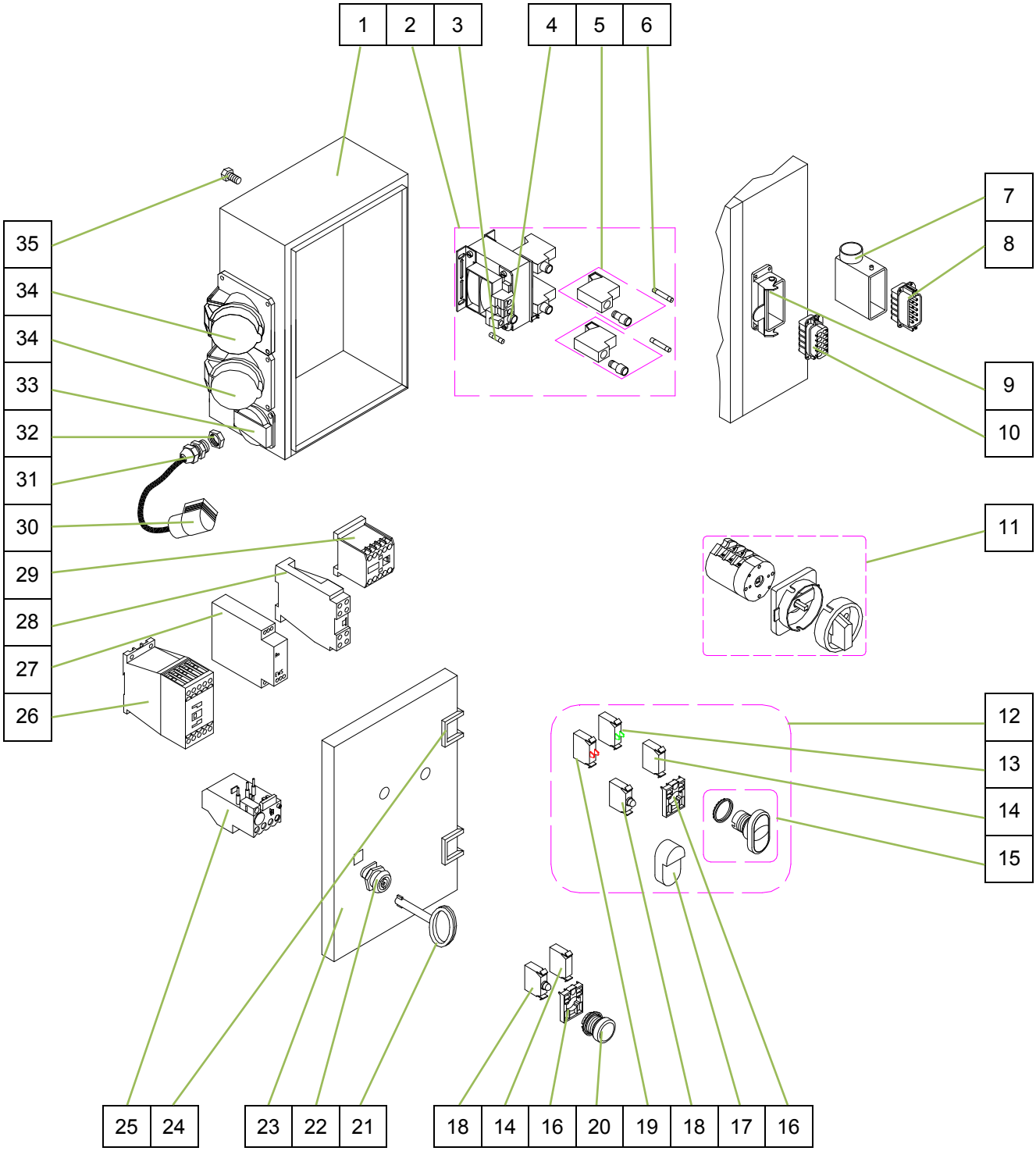
Spare parts drawing

Item	Qty.	Art.No.	Description
1	4	20 20 61 00	Hex. screw M8 x 20 galv.
2	4	20 20 93 13	Washer B 8,4 125 galv.
3	4	20 20 72 00	Safety nut M 8 985 galv.
4	2	00 00 71 53	Support for mounted plug HM 22/24/2002
5	1	00 00 12 28	On/Off switch with phase changing device 6.5-10A
6	1	00 04 11 41	Connector skintop with nut M16 x 1.5
7	1	00 00 21 27	Cable set HM 24
8	2	00 02 20 63	Plug solenoid valve
9	2	20 15 26 12	Gasket solenoid coil type 280
10	3	00 04 11 42	Skintop screwing M 25 x 1.5
11	1	00 02 20 75	CEE-plug 5 x 16A 6h
12	4	20 20 62 03	Safety nut M4 galv.
13	4	20 20 63 05	Cheese-head screw M4 x 12

For spare parts orders only with specification of the type plate!

Spare parts drawing

26.20 Control box HM 24 Art.No. 00008735



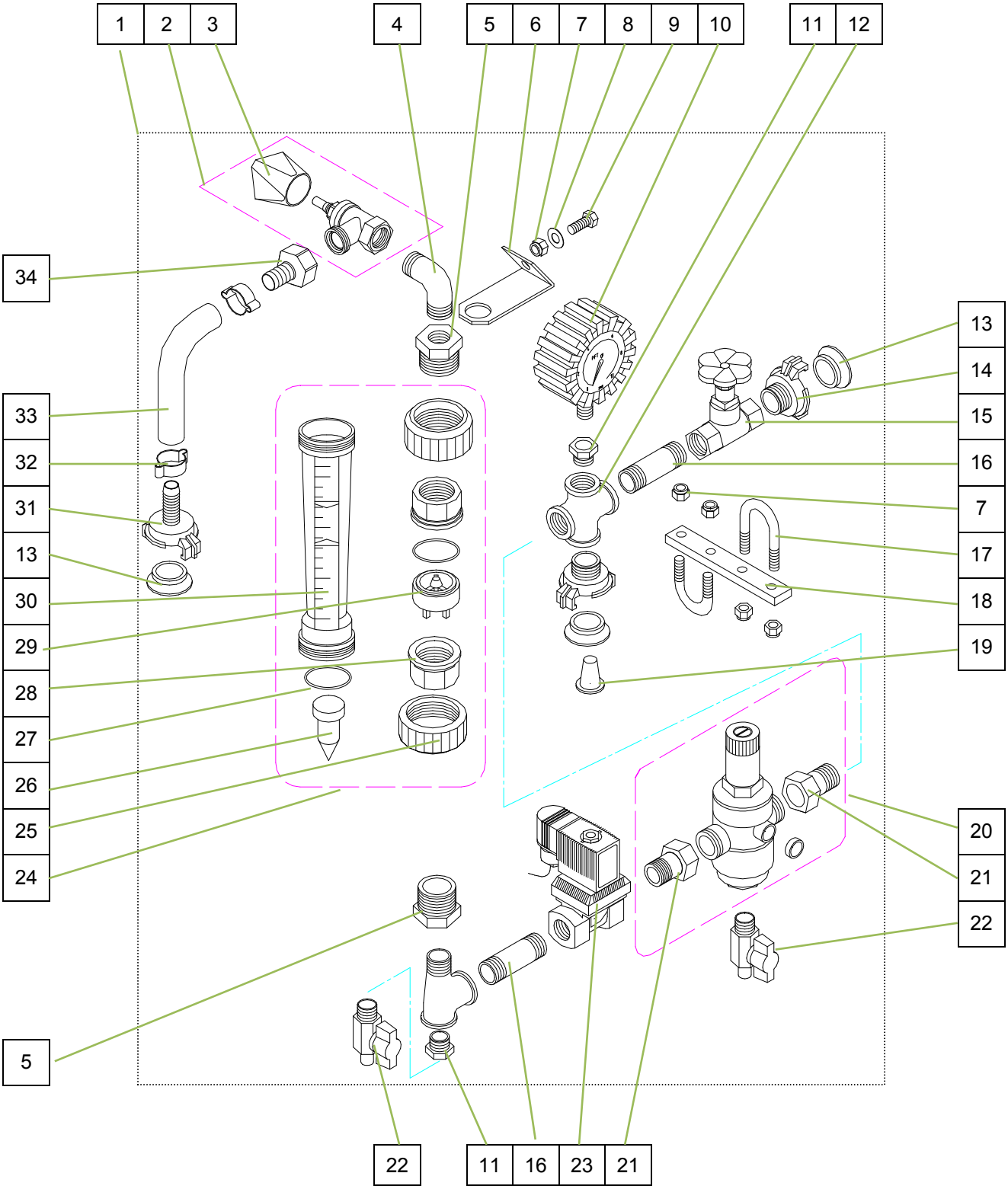
Spare parts drawing

Item	Qty.	Art.No.	Description
1	1	00 02 21 13	Empty housing HM 104 RAL 7032/structure
2	1	00 02 21 38	Transformer 400 V - 42 V 70 VA
3	1	20 41 90 21	Fuse 5 x 20, 2.0 A
4	1	00 01 24 75	Fuse cap round/black bayonet socket
5	2	20 41 92 50	Fuse link TRKS 4/1-SI (5x30)
6	1	00 08 72 53	Fuse 5 x 30, 0,63A
7	1	20 42 98 23	Socket housing HAN 10A 10 pins angled
8	1	20 42 98 22	Male insert small 10 pins HAN 10A
9	1	20 42 98 21	Socket housing 10 poles, HAN 10A
10	1	20 42 98 24	Female insert 10 pins, HAN 10A
11	1	20 45 52 00	Main reversing switch, cpl.
12	1	00 05 59 54	Luminous push-button key on/off cpl. M22
13	1	00 05 38 35	Contact-element 1 make contact M 22
14	2	00 05 38 86	LED - resistor - additional series resistor 42 V
15	1	00 05 38 32	Luminous push-button key on/off M 22
16	2	00 05 38 34	Fastening adapter M 22
17	1	00 05 38 31	Membranes angular for double pressure switch M22-TDD
18	1	00 05 38 81	Luminous element white 12-30V
19	1	00 05 38 36	Contact-element 1 break contact M 22
20	1	00 05 38 74	Front cap for the signal lamp yellow M 22
21	1	20 44 45 00	Key for control box
22	1	00 03 62 49	Lock for control box
23	1	00 04 31 13	Door HM 104 RAL7032
24	2	00 05 37 67	Hinge 180° cpl. for control box
25	1	00 08 53 76	Motor protection relay 6-10A type ZB12, construction size I
26	1	00 08 42 24	Air-break control DIL M15-10 42V
27	1	20 45 27 51	Phase sequence relay 200-500 V type FPF 2
28	1	20 45 27 00	Time lag relay 42V, 1,5-30 sec.
29	1	20 44 72 00	Contactor DIL ER 22, 42V
30	1	00 02 20 63	Plug solenoid valve
31	2	00 04 11 41	Connector skintop with nut M16 x 1.5
32	2	00 04 11 43	Counternut Skintop M 16 x 1.5
33	1	20 42 72 10	Panel mounted socket Schuko 16A grey
34	2	20 42 66 10	Panel mounted socket CEE 4 x 16A 6h red
35	4	20 20 87 01	Hex. screw M8 x 16 galv.

For spare parts orders only with specification of the type plate!

Spare parts drawing

26.21 Water Manifold Unit Art.No. 00002119 / 00211923



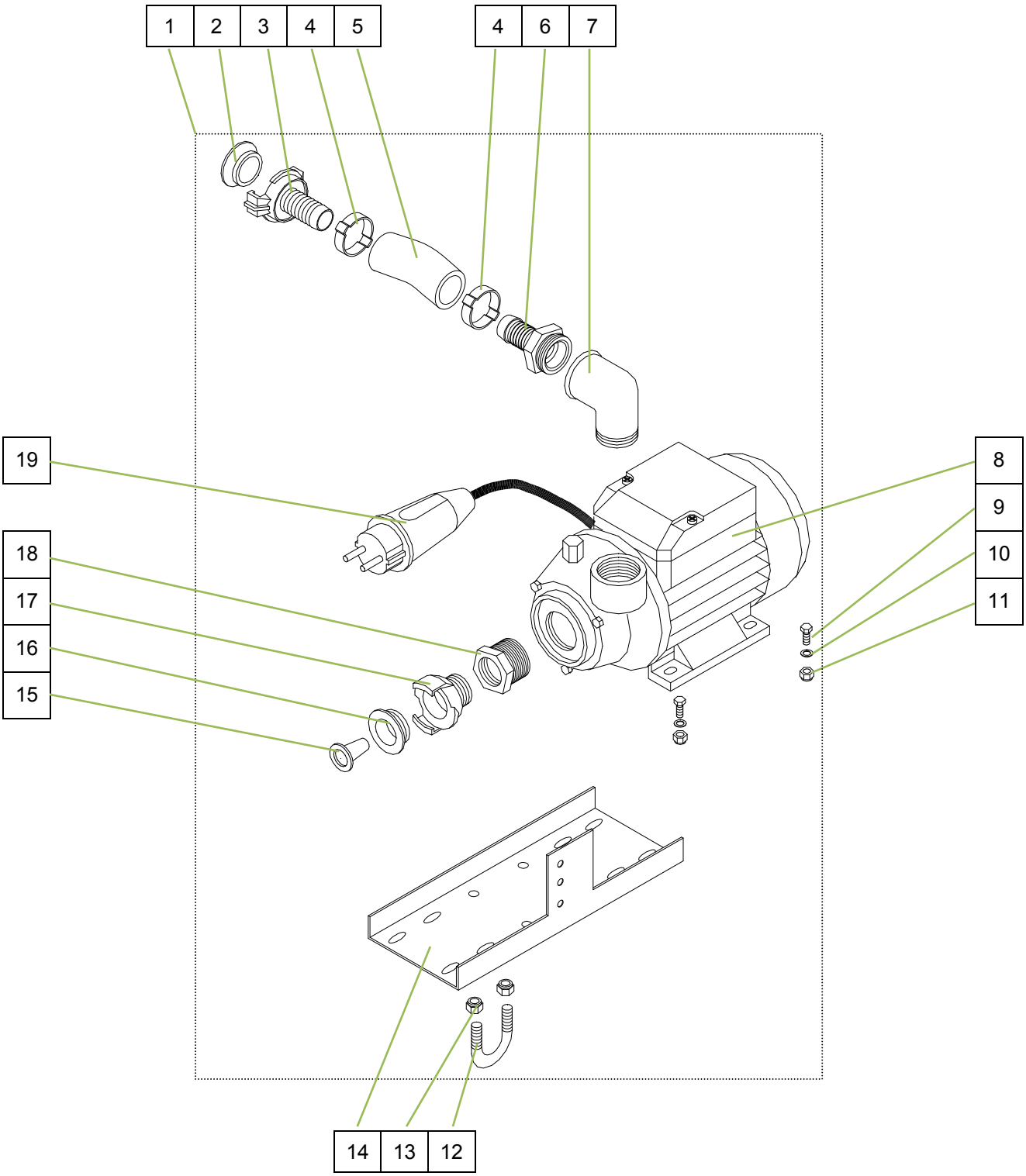
26.22 Spare parts list Water Manifold Unit Art.No. 00002119 / 00211923

Item	Qty.	Art.No.	Description
1	1	00 00 21 19	Wasserarmatur HM 24
2	1	20 15 77 00	Needle valve 1/2" type 6701
3	1	20 15 78 00	Hand knob for needle valve 1/2"
4	1	20 20 36 12	Curved section 1/2" ext. thread galv.
5	2	20 20 54 00	Reducing nipple 1" ext. thread 1/2" int. thread galv.
6	1	00 00 22 92	Bracket for water flow meter HM 24 100-1000 l/h 200mm
7	5	20 20 72 00	Safety nut M 8 galv.
8	1	20 20 93 13	Washer B 8,4 galv.
9	1	20 20 87 01	Hex. screw M8 x 16 galv.
10	1	20 21 60 00	Gauge 0-10 bar 1/4" at bottom, D = 63mm
11	1	20 20 52 00	Reduction piece 1/2" ext. thread - 1/4" int. thread galv.
12	1	20 20 47 00	Angled distributor 1/2" int. thread, 4-way
13	3	20 20 17 00	Seal for Geka coupling (50 pieces)
14	2	20 20 09 00	Geka coupling 1/2" ext. thread with gasket
15	1	20 21 52 00	Tap 1/2" without drainer
16	2	20 20 34 01	Double nipple 1/2" X 60mm galv.
17	3	20 20 99 86	Steel bow M8 X 1"
18	1	00 00 21 21	Support for water manifold HM 22/24
19	1	20 15 20 00	Water inlet filter for Geka coupling
20	1	00 00 15 58	Pressure reducer D 06F 1/2"
21	2	20 20 31 07	Nipple 1/2" ext. thread flat with nut 3/4"
22	2	20 21 53 00	Tap 1/4" ext. thread with socket 10mm
23	1	00 45 64 51	Solenoid valve 1/2", 400V, 50/60Hz, type 6213 A
24	1	00 00 22 13	Water flow meter 100-1000l/h 250mm
25	2	20 18 45 10	Connection nut 1 1/2" for water flow meter 20184000
26	1	20 18 42 00	Cone for water flow meter type 1600/2500
27	2	20 18 43 00	O-ring D 34 x 3,5
28	2	20 18 46 00	Insertion piece 1"
29	2	20 18 47 00	Stop for part. no. 20 18 40 00, 20 18 49 00, 20 18 50 00
30	1	20 18 40 12	Plastic tube 100-1.000 l/h 200mm
31	1	20 20 15 00	Geka coupling 1/2"
32	2	00 05 91 96	Hose clamp 19-21
33	1	20 21 36 02	Water-/air hose 1/2" x 400mm
34	1	20 20 37 80	Hose socket 1/2" conical with nut 3/4" int. thread

For spare parts orders only with specification of the type plate!

Spare parts drawing

26.23 Water pressure booster pump HM 24 cpl. Art. No. 00070238



26.24 Spare parts list water pressure booster pump HM 24 cpl. Art.No. 00070238

Item	Qty.	Art.No.	Description
1	1	00 07 02 38	Water pressure booster pump HM 24 cpl.
2	1	20 20 17 00	Seal for Geka coupling (50 pieces)
3	1	20 20 16 00	Geka coupling 3/4" socket (packing unit = 10 pcs)
4	1	00 00 21 98	Water-/air hose 3/4" x 290mm
5	2	00 05 91 96	Hose clamp 19-21
6	1	20 19 04 43	Hose screw joint 1" ext. thread socket 3/4"
7	1	20 20 36 20	Curved section 1" int. thread-ext.thread galv.
8	1	00 23 13 67	Water pressure booster pump SL-AV3 PK a 37kW 230V
9	4	20 20 71 03	Hex. screw M6 x 20 galv.
10	4	20 20 93 00	Washer B 6,4 galv.
11	4	20 20 62 00	Safety nut M6 galv.
12	4	20 20 99 86	Steel bow M8 X 1"
13	2	20 20 72 00	Safety nut M8 galv.
14	1	00 00 97 69	Support for AV 3 at HM 22/24
15	1	20 15 20 00	Water inlet filter for Geka coupling
16	2	20 20 17 00	Gasket Geka-coupling (packing unit = 50 pieces)
17	1	20 20 09 10	Geka coupling 3/4" ext. thread
18	1	20 20 50 00	Reducing nipple 1" ext. thread-3/4" int. thread galv.
19	1	20 42 41 43	Motor connection cable 0,8m Schuko plug and cable lug

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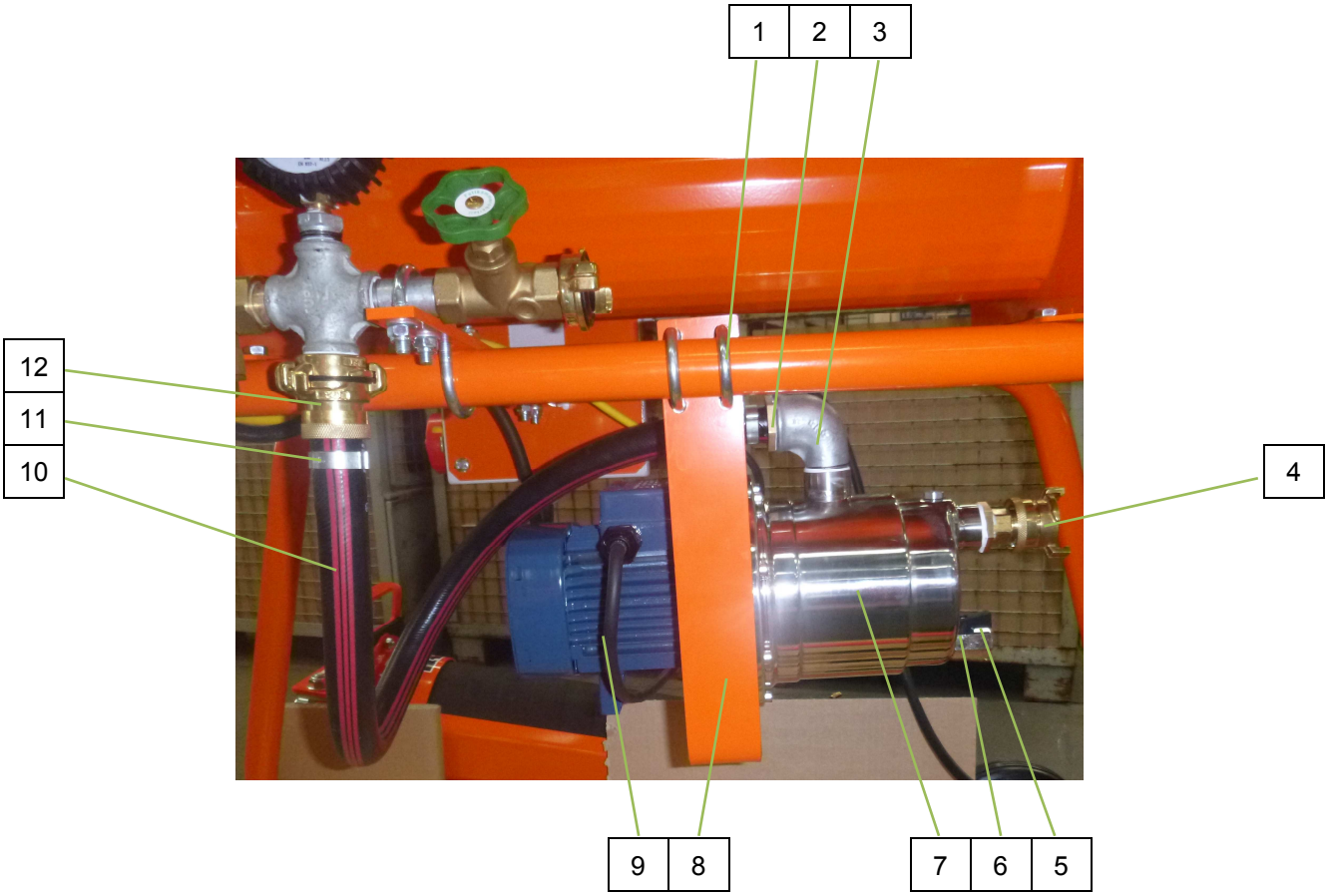
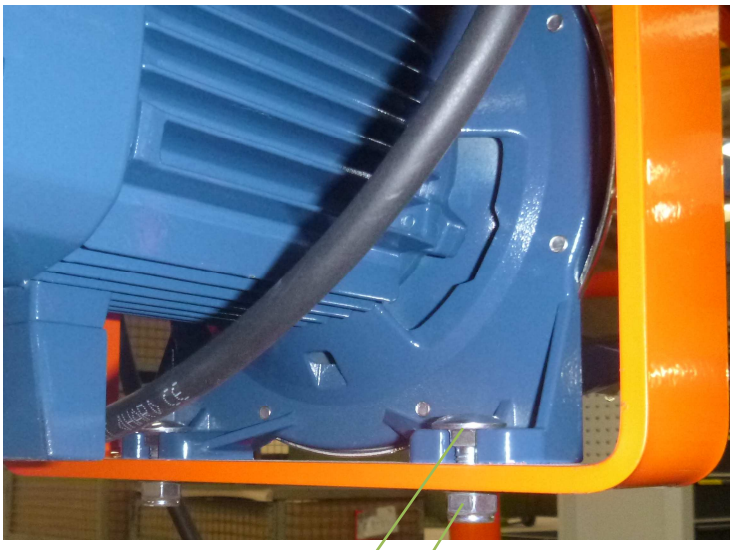
Spare parts drawing

26.25 Water pressure booster pump AV1000 HM 24 Art. No. 00466201





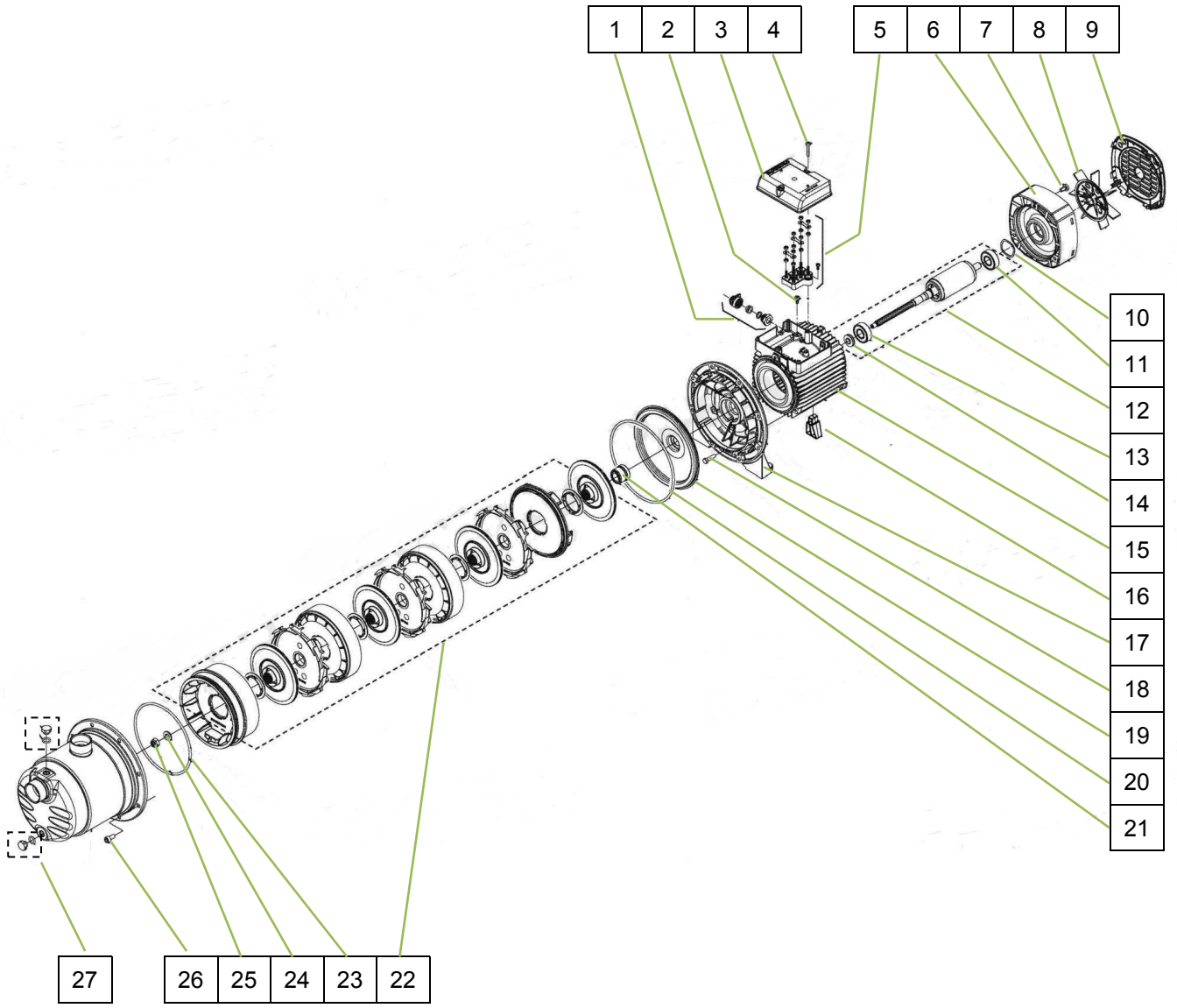
26.26 Spare parts list water pressure booster pump HM 24 cpl. Art.No. 00070238

Item	Qty.	Art.No.	Description
1	4	20 20 99 86	Steel bow M8 X 1"
2	1	20 19 04 43	Hose screw joint 1" ext. thread socket 3/4"
3	1	20 20 36 20	Curved section 1" int. thread-ext. thread galv.
4	1	20 20 16 81	High pressure coupling 3/4" ext. Thread with seal
5	1	00 27 19 87	Ball tap 1/8" Internal thread/external thread, one-side lever
6	1	20 56 53 27	Copper gasket D=10.5
7	1	00 49 30 84	Water pressure booster pump AV1000/1 230V 1Phase 50Hz
8	1	00 46 62 03	Support AV1000/1 HM 22/24 RAL2004
9	1	20 42 41 43	Motor connection cable 0,8m Schuko plug and cable lug
10	1	20 21 36 08	Water-/air hose 3/4" x 750mm
11	2	20 20 29 00	Hose clip 28-31 packing unit=10ST
12	1	20 20 16 80	High pressure coupling 3/4" socket with seal
13	8	20 20 72 00	Safety nut M8 galv.
14	2	20 20 63 23	Saucer-head screw M8 x 25 galv.

For spare parts orders only with specification of the type plate!

Spare parts drawing

26.27 Spare parts list AV1000/1 400V 60Hz Art.No. 00491839



26.28 Spare parts list AV1000/1 400V 60Hz Art.No. 00492679

Item	Qty.	Art.No.	Description
1	1	On request	Nozzle
2	4	On request	Screw
3	1	On request	Cover
4	4	On request	Screw
5	1	On request	Terminal board
6	1	On request	Bearing cap rear
7	4	On request	Screw
8	1	On request	Fan
9	1	On request	Fan hood
10	1	On request	Compensating spring
11	1	On request	Grooved ball bearing
12	1	On request	Shaft with rotor
13	1	On request	Grooved ball bearing
14	1	On request	Arrester
15	1	On request	Motor housing with winding (230/400V)
16	1	On request	Support foot
17	1	On request	Bearing cover front
18	3	On request	Screw
19	1	On request	Cover pump body
20	1	On request	O-ring for pump body
21	1	00467107	Face seal for AV 1000
22	1	On request	Wheel- und Diffuser set
23	1	On request	O-ring for pump body
24	1	On request	Washer
25	1	On request	Nut for wheel
26	4	On request	Screw for pump body
27	1	On request	Screw with O-ring

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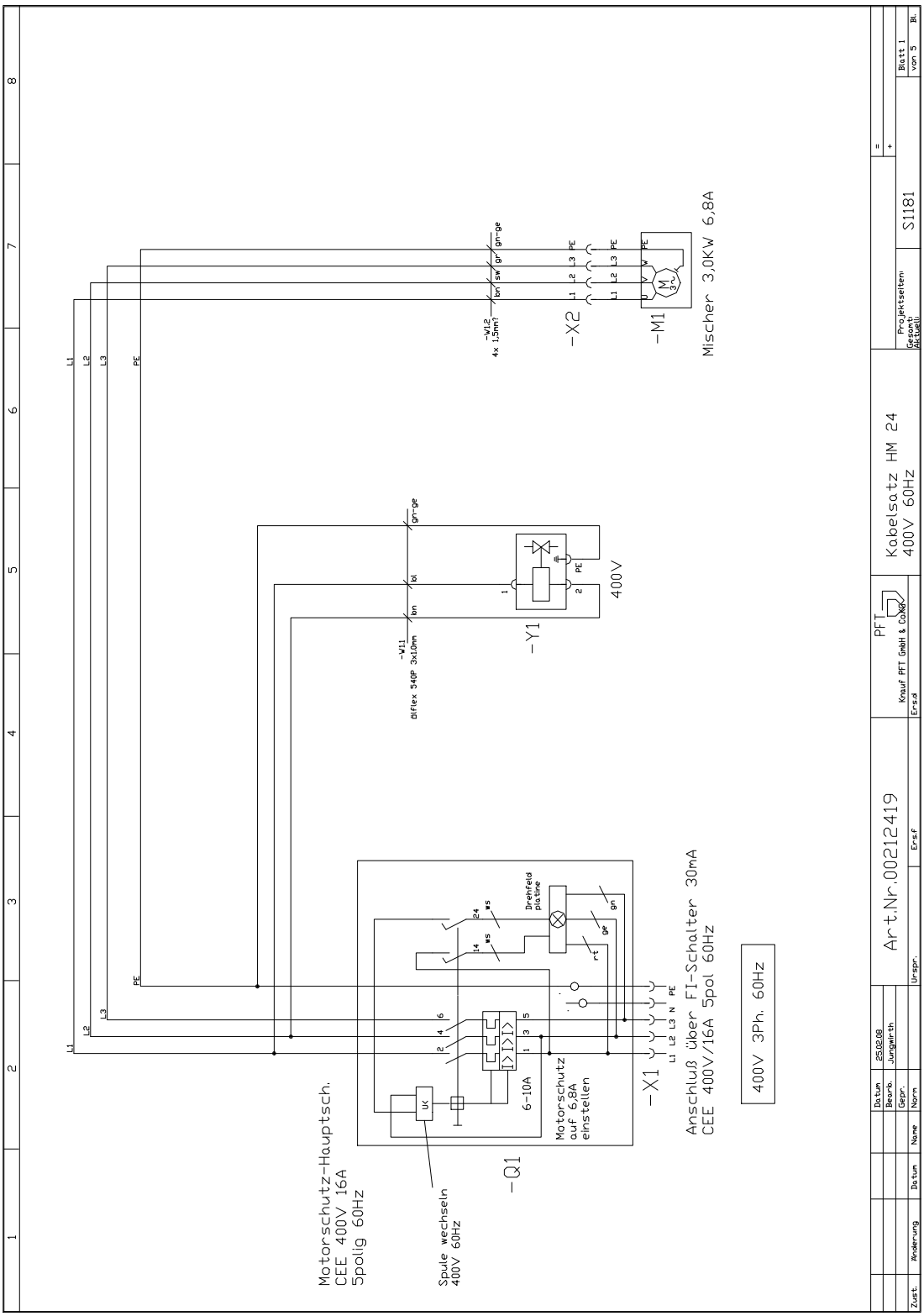
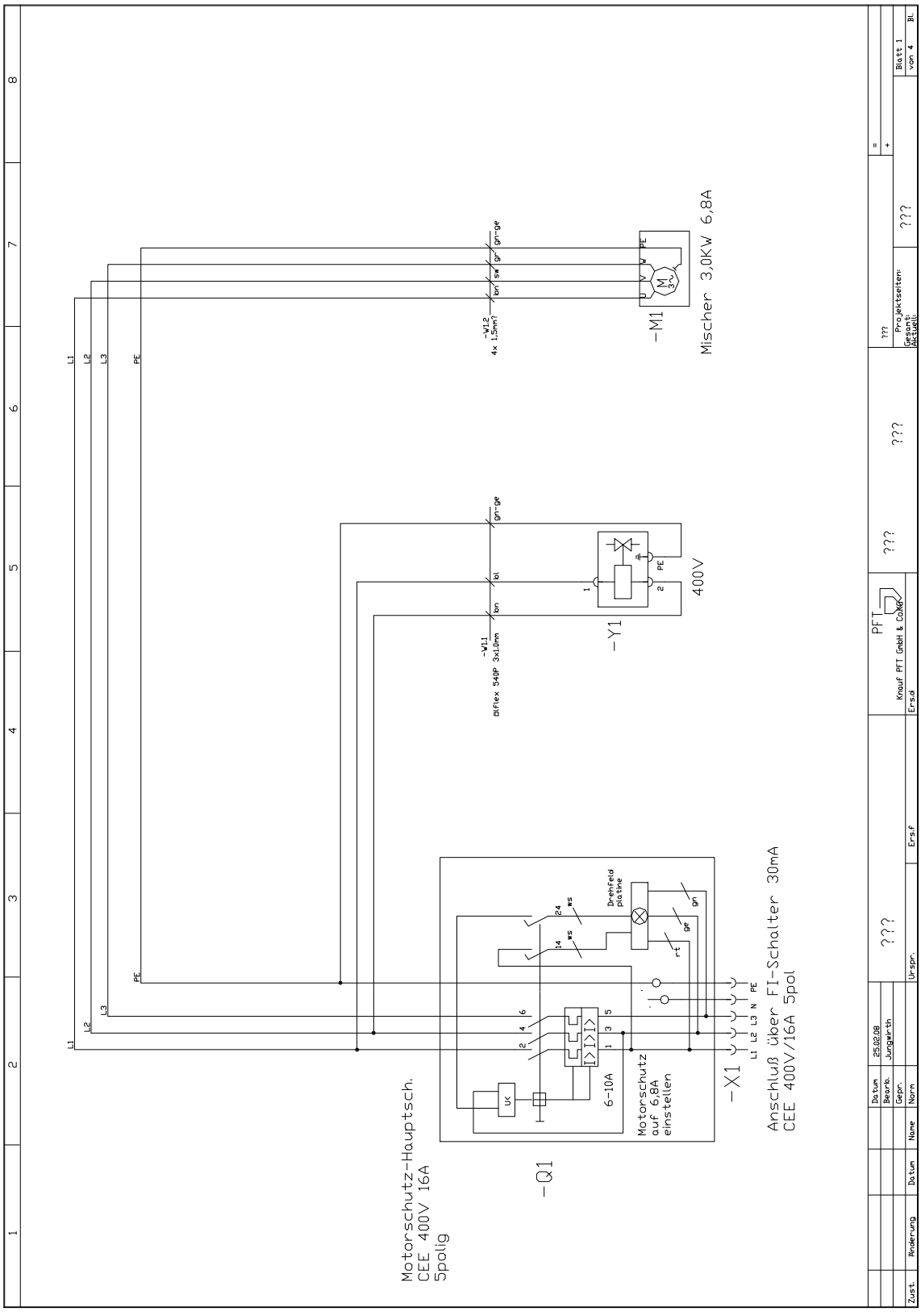
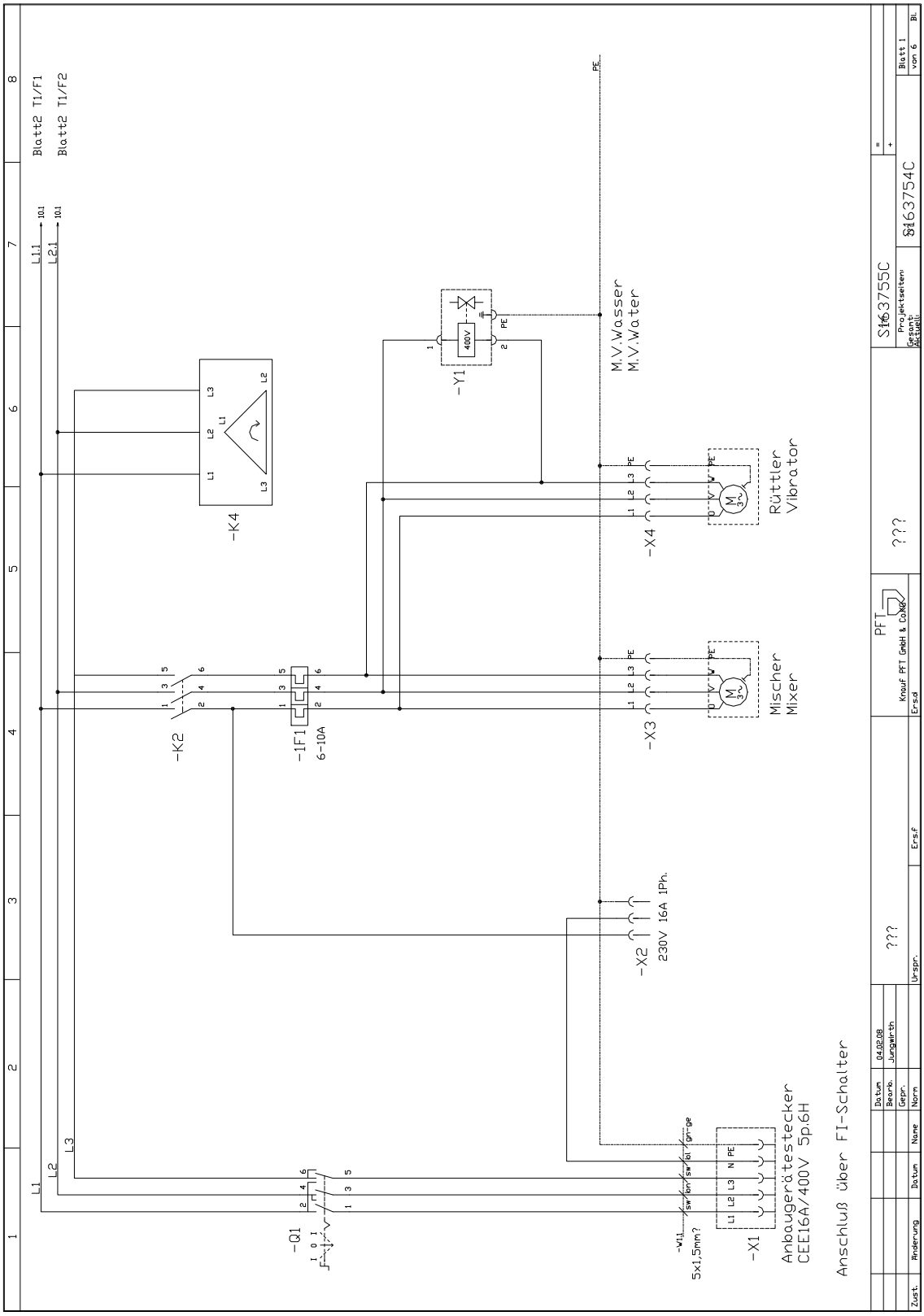
27 Circuit Diagramm 60Hz



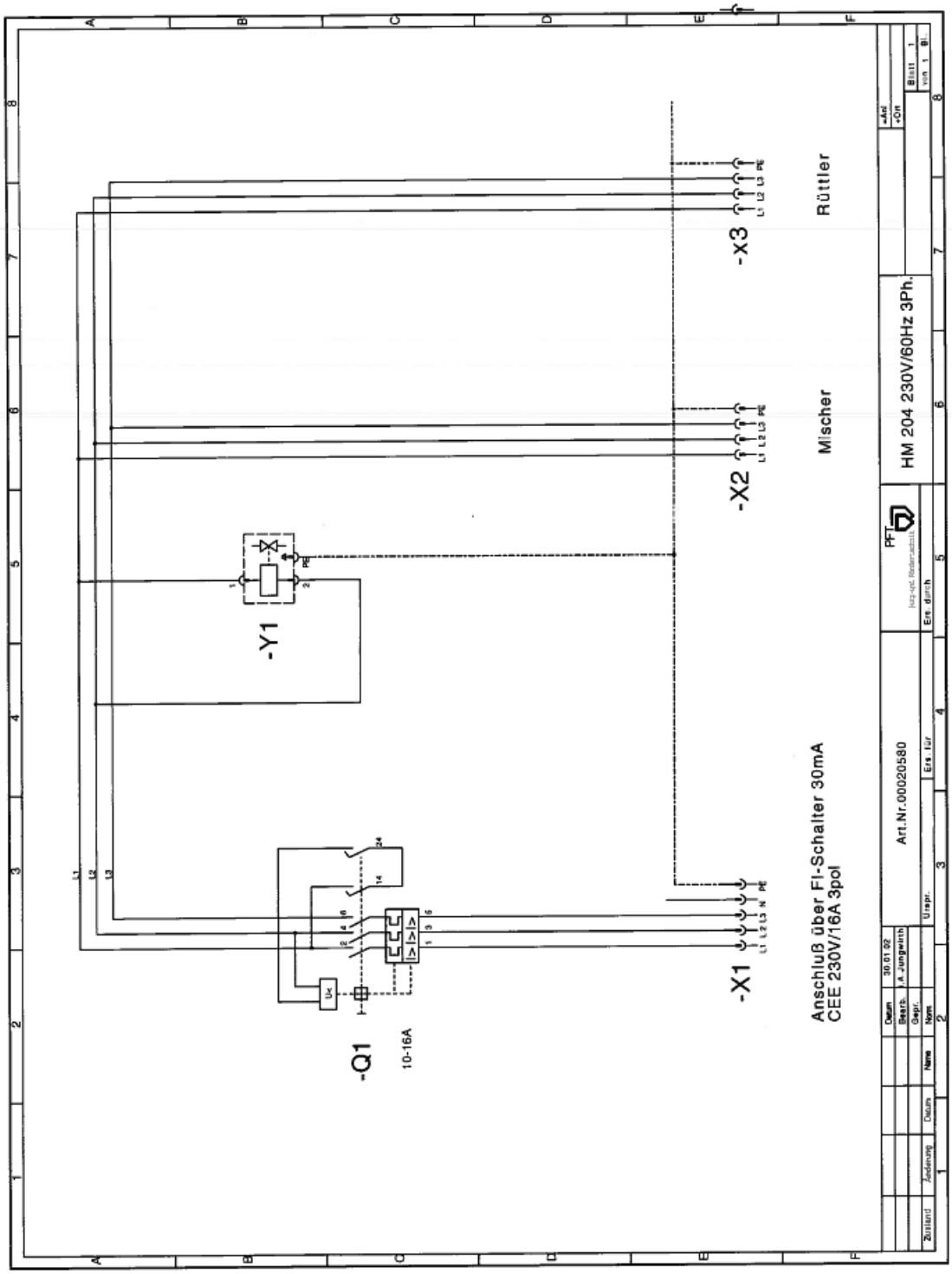
28 Circuit Diagramm Cable set 00002127



29 Circuit Diagramm HM 24 S163754C



30 Circuit Diagramm HM 24, 230 V, 3 phases 60 Hz



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