kränzle®

USA

Hot Water-High Pressure Cleaners

2175

single phase
220V / 60Hz

Funkschutz

CE

TÜV PRODUKT SERVICE GS

made in Germany

Operating manual
Read and conform safety instructions before use

Description

Dear Customer

We would like to congratulate you on your new hot water high pressure cleaner, and to thank you for buying it!

The following pages contain information about the machine in order to familiarize you with it and facilitate its use.

The machine is a professional cleaning aid in all cleaning tasks, e.g.:

- **facades**
- **flagstones**
- **removing of old paint etc.**
- **vehicles of all types**
- **sheds**
- **machines**
- **containers**
- **e.g.: food processing industry**

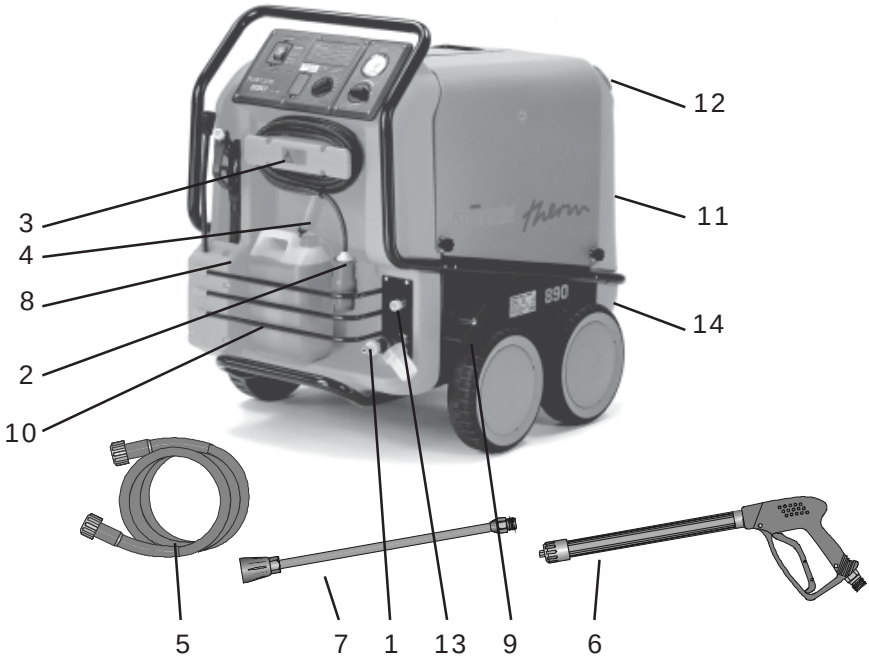
Technical data	**therm 2175**
Operating pressure	450 - 2500psi
Permissible overpressure	2700 psi
Water output (*1)	up to 3,5 Gpm
Hot water output	80 - 200 °F
Contin. adjustable steam level	300 °F
High pressure hose with hose drum	10 m 20 m
Heating oil consumption	5.9 kg/h - heating oil EL (DIN 51 603)
Exhaust gas mass flow	
Electrical rating: Input Output	230V / 60Hz / 25A P1: 5.5 kW P2: 5.0 kW
Weight	220 kg
Dimensions in mm without reel	800 x 1200 x 1050
Sound level acc. to DIN EN ISO 3744 + 31200 (rel. to working place)	91 dB
Vibrations at lance	
Recoil at lance	approx. 20 N

Permissible tolerance for figures ± 5 % in acc. with VDMA uniform sheet 24411

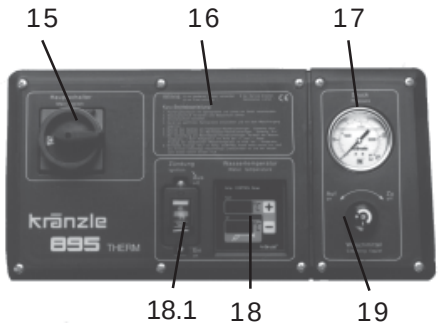
(*1) Min. water quantity to be supplied to the high pressure cleaner!

Description

Construction and Function



1 Water inlet connection with filter
2 Power cable
3 Winder for cable
4 Suction hose for detergent
5 High pressure hose
6 Spray gun
7 Spray pipe attachment
8 Storage bin for spray gun and pipe
9 Brake
10 Storage bin for accessories
11 Fuel tank
12 Filler aperture for fuel
13 High pressure outlet
14 Fuel drainage screw



15 Master switch (appliance On- Off)
16 Brief operating instructions
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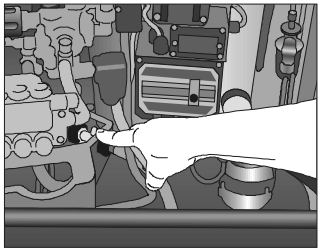
18.1 (Burner ON- OFF) ignition
19 Detergent dispensing valve

Description

Water system



The water flows into a tank.
A float valve regulates the water intake.
The water is then directed to the safety spray pipe under pressure from the high pressure pump.
The high pressure spray is formed through the nozzle on the spray pipe.

Detergent and caring system

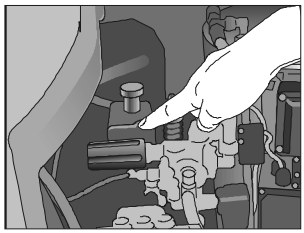
The high pressure pump can also suck a detergent/caring agent and mix it with the high pressure jet. - The detergent must have the ph-value 7-9 neutral.

Only open the dosing valve, if the chemistry sieve is placed in a liquid.

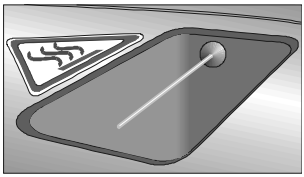
The rules concerning the environment, refuse and ground water protection must be complied with!

Pressure control and safety facilities

The pressure control valve allows full adjustment of the quantity and pressure of the water.

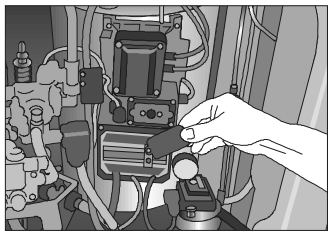


The safety valve protects the machine from excessive pressure and cannot be adjusted beyond the admissible operating pressure. The setting nuts are sealed with lacquer.



As an additional safety feature against overheating of the combustion chamber a temperature sensor is installed in the chimney. This sensor switches off the burner motor, the ignition transformer and the solenoid valve as soon as the exhaust gas temperature exceeds 250° C.

You find the unlocking button for the excess temperature release on the console fixed to the combustion chamber below the ignition transformer.



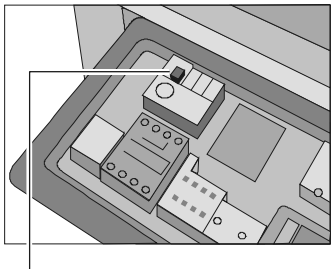
The machine has to rest for approx. 15 minutes before it is allowed to press the unlocking button. If the excess temperature sensor switches the machine off repeatedly please call the technical service.

Replacements, repairs, new adjustments and sealing operations may only be performed by trained personnel.

Description

Motor protection switch

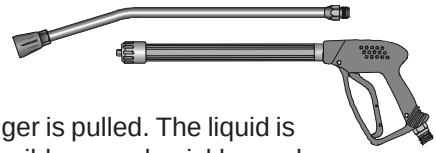
The pump motor is protected from overload by a motor protecting switch. In case of an overload the motor is switched off by the motor protecting switch. In case the blue button is not set to „automatic resetting“, it has to be pushed in again by hand. In case of a repeated switching off of the motor by the motor protecting switch the cause of the malfunction has to be removed.



Blue button in the unfolded control panel

Replacement and inspection work may only be performed by trained personnel.

Spray pipe with spray gun



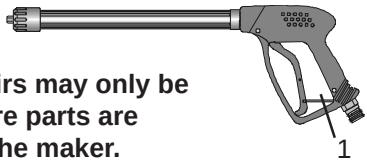
The spray gun only allows the machine to be operated when the safety trigger is pulled.

The spray gun can be used when the safety trigger is pulled. The liquid is then pumped up to the nozzle. Spray pressure builds up and quickly reaches the selected operating pressure.

When the trigger is released the gun is closed, which prevents any further liquid from coming out of the spray pipe.

The recoil resulting from the gun being closed opens the pressure control valve in the machine. The pump remains switched on and pumps the circuit with reduced overpressure. When the gun is opened the pressure control valve closes and the pump starts to operate again at the selected pressure.

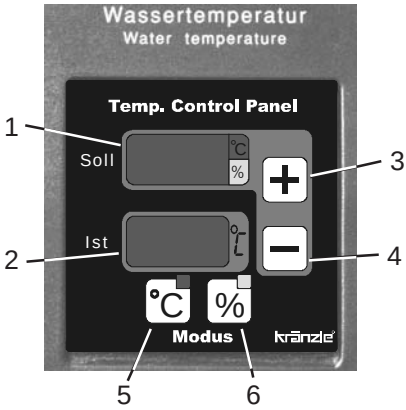
After completing work with your Kränzle therm, or if work is interrupted, the safety catch (1) must be applied. This makes it impossible to press the trigger by accident.



The spray gun is a safety device. Repairs may only be performed by trained personnel. If spare parts are required, use only those approved by the maker.

Description

Thermostat



The thermostat controls the spray water temperature.

After you switch on the device, "888" appears in both displays for approx. 1 second as a test of the functioning of the displays.

The thermostat also monitors the minimum fuel level in the tank with a floating switch. If the level is below the minimum amount, the thermostat switches the oil burner off and the "OIL" sign flashes in the set temperature display (Pos. 1). If the unit displays "FLA" in the upper display, a malfunction in burning exists.

The thermostat has two operating modes:

1. Temperature mode

This mode is always activated when the unit is switched on or can be selected using the "°C°" button (Pos. 5). The red LED above the "°C" button and next to the set temperature display lights up.

The desired "Set" temperature is set using the two buttons (+/-, Pos. 3+4) and can be read in the upper display (Pos. 1).

If you press the button for a longer time, the set temperature is quickly adjusted in 5°C increments.

The last set value set is also stored after the unit is switched off and is available again immediately after switching back on.

The current spray temperature can be read from the bottom display (Pos. 2).

2. Percent mode

This mode is activated by pressing the "%" button (Pos. 6). The yellow LED above the "%" button and next to the set temperature display flashes.

In the temperature control system in conventional high pressure cleaners, and in temperature mode for this unit, the water temperature is measured at the outlet of the heater, and the heater is switched on an off according to the temperature desired by the user. Due to the large amount of water in the heating coil, it takes a long time until the temperature sensor registers that the burner has switched on and the desired temperature has been reached. This means that the temperature increases far above the desired value or falls far below the desired value.

The innovative new *percent mode* now lets the user specify the switching duration of the heater in percent using the "+" and "-" buttons (Pos. 3+4) (100% being the max. temperature) rather than setting the desired temperature. Now the result of the setting must be checked by using the "Actual" temperature display. If the desired temperature has not yet been reached, the percentage must be increased.

By setting percentages of the heating duration, the temperature of the high pressure jet is kept constant in a very narrow range.

The last value set is also saved after the unit is switched off in percent mode.

Description

Heat exchanger

Heating coil: 34 m long - Content: 5 l of water – Heating capacity: 70 k W

The heat exchanger is heated by a high pressure fan heater.

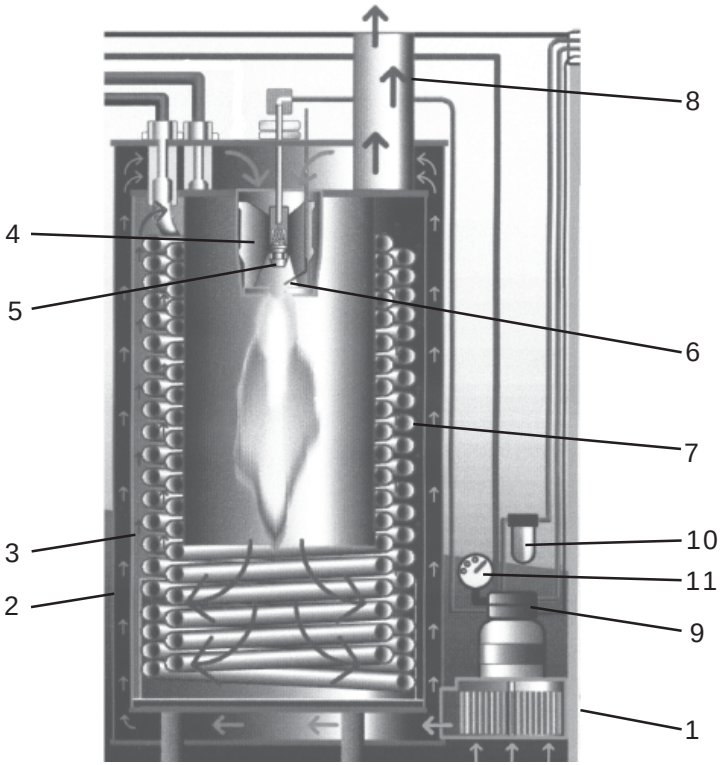
A ventilator (1) draws in the cold, fresh air from the bottom end of the machine and forces it upwards between the outer mantle (2) and the inner mantle (3). In the process, the fresh air is pre-heated and the outer mantle of the heat exchanger is cooled.

The pre-heated air is pressed through a mixing unit (4). Here finely atomized fuel is injected via a nozzle (5) and mixed with the air. The electrodes (6) located below then ignite the fuel-air mixture.

The flame burns from top to bottom, turns round and the hot gas flows past the heating coil (7) on its way back up. The burned gases collect in the exhaust chamber and are emitted from the chimney (8).

The water is forced through a heating coil by the high pressure pump. Hot air flows around the coil, as described above.

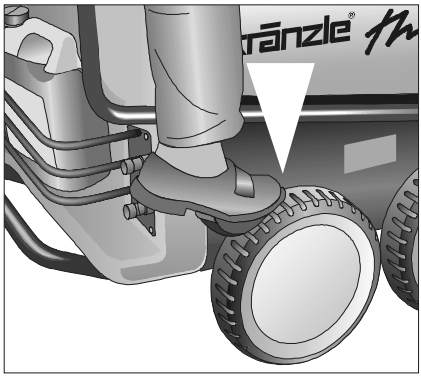
The fuel pump (9) draws the oil through a filter (10) and pumps it to the injector nozzle (5). The surplus quantity of fuel flows straight back into the tank. The oil pressure (approx. 10 bar) is shown on the fuel manometer (11).



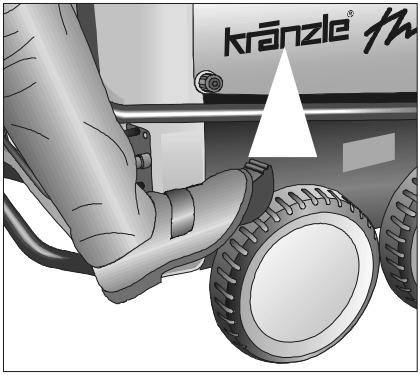
Brake

The Kränzle therm is fitted with a brake that prevents the machine from rolling away on flat ground.

Always apply the brakes firmly when working with the machine !!!

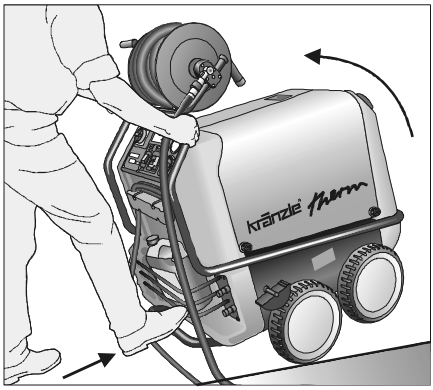


Brake applied



Brake not applied

If you want to move the high pressure cleaner into another direction, first slightly tilt back the machine by pressing the foot rest and pulling the pushbar at the same time.



Now you can move the cleaner into the desired direction.

Safety Information

CAUTION !!!
For safety reasons always put the master switch into the „0“ position (=power switch-off) after completion of work.

When starting the cleaning process do not aim the high pressure jet at the object to be cleaned for at least 30 seconds.
It is possible, that the water contents in the combustion chamber (approx. 5 litres) has changed colour due to the resting time.

Safety Information

Important !!!

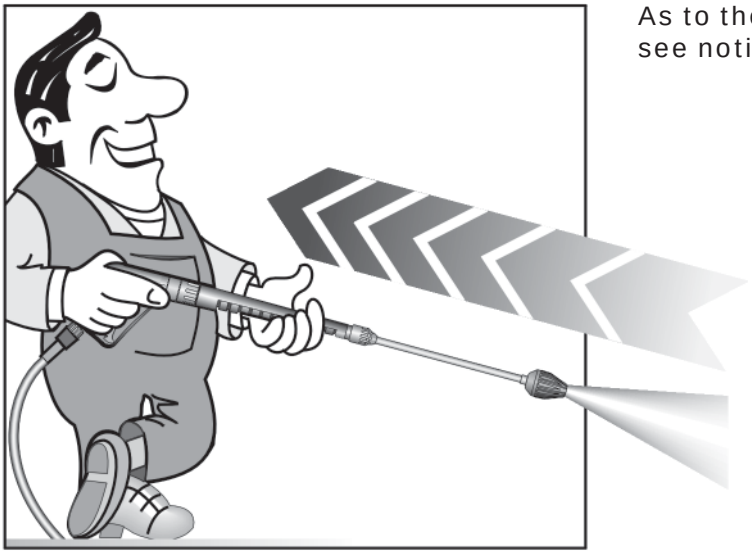
The machine must be disconnected from the power supply when servicing work is being carried out. The master switch should be in position "0" and the plug out of the socket.
Do not use the cleaner if electrical connections or other safety-relevant parts (e.g. overpressure valve, high pressure hose, spraying equipment etc.) are damaged.

The machine may only be used by persons who have received the necessary training.

- Never operate the machine without supervision.
- The water spray can be dangerous. It should never be directed at people, animals, electrical apparatus or the machine itself.
- Never direct the spray at power sockets.
- Parts of the machine interior and parts of the gun and lance become hot when hot water is used. Leave the cover of the machine closed when using the machine and do not touch the metallic parts of the gun and lance.
- Children must not use high pressure cleaning equipment.
- Do not damage the cable or repair it incorrectly.
- Do not pull the high pressure hose if there are kinks or loops in it. Make sure that the hose is not damaged on sharp edges.
- Persons operating the machine should wear the necessary protective clothing, i.e., waterproof clothing, rubber boots, safety goggles, headwear etc. It is prohibited to use the machine in close vicinity to people lacking suitable protective clothing.
- The high pressure spray can generate a high level of noise. If noise exceeds the maximum allowed levels, users and others in the vicinity must wear suitable ear protection.
- The high pressure spray causes recoil and additional twisting movement if the gun is angled. The gun must therefore be held firmly with both hands. (see page 2)
- **Do not close off the exhaust aperture on the topside of the machine.** Do not bend over this aperture and do not put your hands inside it. **Exhaust gases are very hot!**
- Do not clamp down the trigger of the gun. Apply the safety catch after use, in order to prevent accidental spraying.
- Do not spray against matter containing asbestos or other hazardous substances.
- Never spray liquids containing solvents, such as paint thinner, petrol, oil, or anything similar. **Note the specifications of the additive makers!** The seals in the machine are not resistant to solvents. The spray vapour of solvents is highly inflammable, explosive and poisonous.

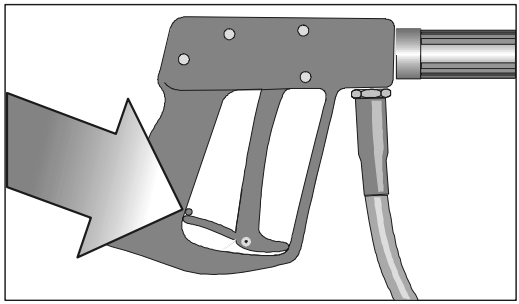
Safety Information

- The machine may not be set up and used in rooms where there is a danger of fire or explosion. The machine may not be used under water.
- Air is required for combustion, and exhaust fumes are generated. If the machine is used in closed rooms, make sure that the exhaust fumes can escape and that there is adequate ventilation.
- Use light heating oil EL (DIN 51 603) or Diesel (DIN EN 590) only. The use of other fuel is perilous and may even cause an explosion.
- Never direct the high-pressure jet at yourself or other persons just to clean clothing or shoes.

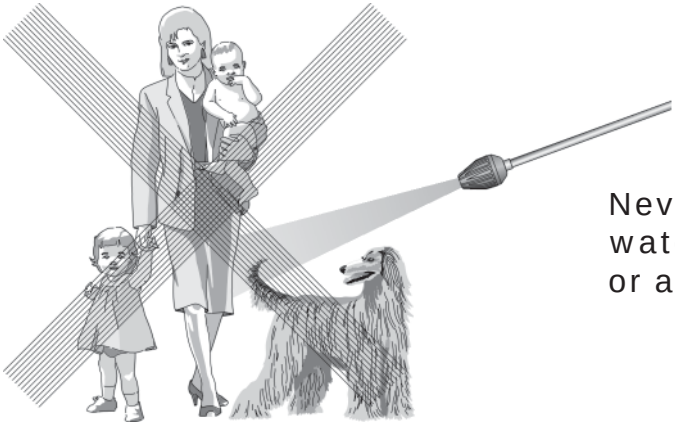


As to the recoil - see notice on page 2!

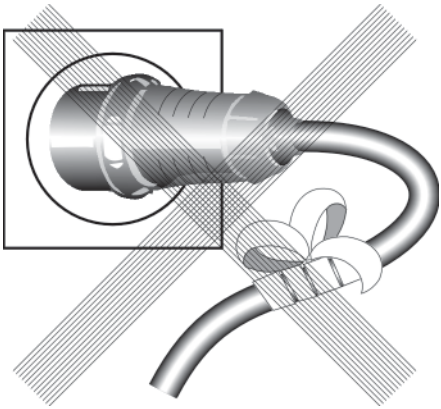
Apply the safety catch on the spray gun after each use, in order to prevent unintentional spraying!



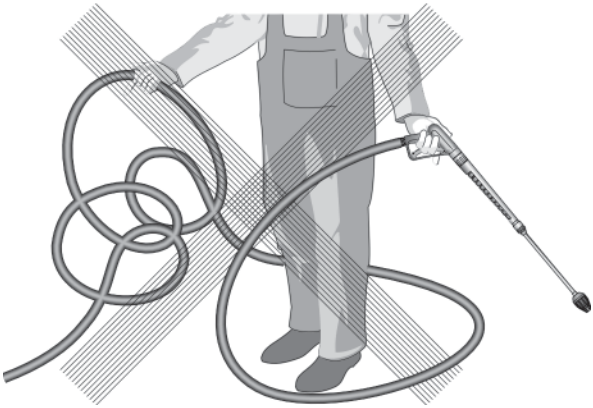
This is prohibited!



Never direct the water jet at people or animals!



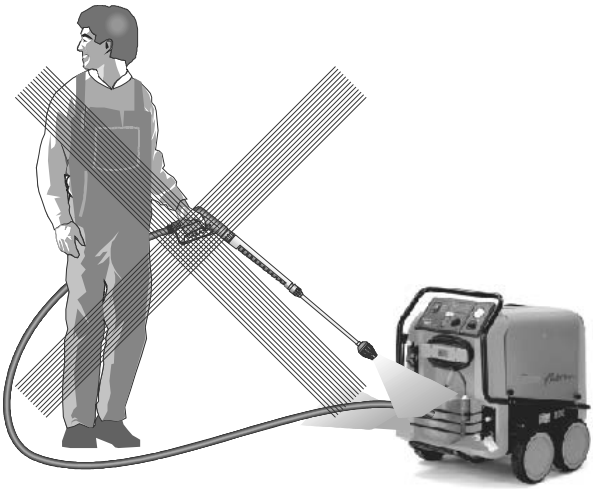
Do not damage the power cable or repair it incorrectly!



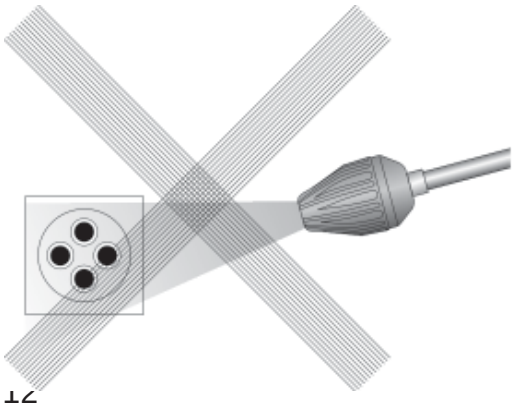
Never pull the high pressure hose if it has formed kinks or “nooses”!
Never pull the hose over sharp edges!

This is prohibited!

Never allow children to use the high pressure cleaner!



Never direct the water jet at the machine itself!



Never direct the water jet at a power socket!

Commissioning

Electrical connection

The voltage given on the specification plate must match the mains voltage.

The machine is supplied with a power cable and plug.

The plug must be connected to a properly installed electrical socket with earthing and have a 30 mA FI residual current circuit breaker. The socket must have a neutral 16A fuse on the mains side.

If an extension cable is used, it must have an earth line that is properly connected to the plug connections. The lines in the extension cable must have a cross section of at least 1.5 mm². The plug connections must be of spray protected design and may not lie on a wet surface. (If the extension cable is longer than 10 m the minimum cross section is 2.5 mm²)

Important!

Extension cables that are too long cause a drop in the voltage and thus interruptions in operation. If you are using a cable drum, the cable must always be fully unwound.

Brief operating instructions

To be found on the machine.

1. Connect the high pressure hose with the spray gun and lance to the machine.

2. Connect the water supply and turn on the tap.

3. Connect to the electrical supply.

4. Switch on the machine with the spray gun open and start the washing procedure.
If the system has to be de-aerated (machine vibrates), open and close the gun several times.

5. When using the machine as a cold water high pressure cleaner:
ignition "OFF" - “desired value“ of thermostat to 0 °C.

6. When using the machine as a hot water high pressure cleaner:
ignition "ON"

7. When using the machine as a hot water high pressure cleaner:
preselect the water temperature or the operating time of the heating with thermostat to min. 40° C. (See page 6)

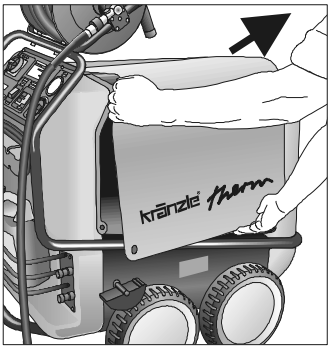
High pressure hose and spray equipment

The high pressure hose and spray equipment supplied with the machine are made of high quality material specially adapted for the operating conditions of the machine, and are properly marked.

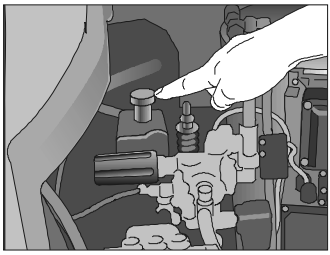
If spare parts are required, only properly marked components approved by the maker should be used. High pressure hoses and spray equipment must be connected so that they are pressure-tight. The high pressure hoses should not be driven over, pulled excessively or twisted. Do not pull the hose over sharp edges, since this will invalidate the warranty.

Commissioning

- Secure the machine by applying the brake.



- Open the right cover of the machine (without chimney)



- and check the oil level of the high pressure pump.

  Do not start the machine if there is no oil on the dipstick. Fill oil if necessary. See page 18.

- Fill the fuel tank with light heating oil prior to use.

Use EL heating oil (DIN 51603) or Diesel fuel only.

Unsuitable fuels, such as petrol, may not be used (danger of explosion).

Water connection

Connect the machine to a water tap using a hose of at least 1/2" and turn on the tap. (2-10 bar admission pressure)

The water tank in the machine fills up. When the tank is full, the built-in float valve closes the water inlet.

Use clean water only!

CAUTION !

Please pay attention to the regulations of your waterworks company.

In accordance with EN 61 770, the machine may not be directly connected to the public drinking water supply lines.

A brief connection however is permissible according to DVGW (German Association for Gas and Water Affairs) if a tube ventilator with check valve (Kränzle Order-No. 410 164) is built into the water supply.

Also indirect connection to the public drinking water supply lines is permissible by way of free emission in accordance with EN 61 770; e.g. by using a reservoir with a float valve.

Direct connection to a non-drinking water supply line is permissible.

High pressure connection

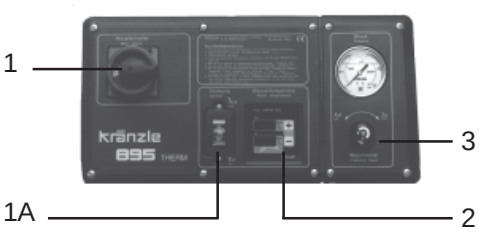
Connect the high pressure hose to the handgun.

Unwind the hose so that it is free of loops and connect it to the handgun and the machine.

Check that all screw-type connections are pressure-tight. Leaks from gun, high pressure hose or hose drum must be eliminated immediately. Leakage leads to increased wear.

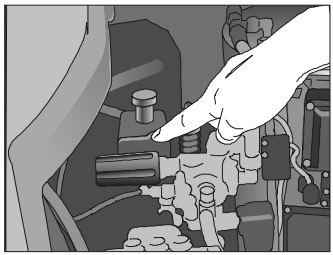
Electrical connection

- Check that the master switch (1) is off (position "0").



Connect the power cable to a properly installed electrical socket with earthing and a 30 mA FI fault current safety switch. The socket must have neutral 16A fusing on the mains side.

- Switch off the ignition. Rocker switch (1A) to „0“.
- Set the pressure control (4) valve to maximum pressure (see on page 4) and close the detergent valve (3).
- Open the gun and switch the master switch on.



The high pressure pump now presses the air out of the lines, and after a short time the high pressure spray is formed and the operating pressure is reached. (Open and close the gun repeatedly)

Adjusting the pressure

Use the pressure control valve (4) directly on the pump head to adjust the pressure.

The machine is fitted with a Total-Stop-System. If the gun is closed for longer than approx. 37 seconds, the machine switches off automatically, after 20 minutes the machine moves to safety switch off and you must use the main switch to turn it back on. The machine restarts automatically when the gun is operated, provided that the master switch is on.

Commissioning

Usage as a cold water high pressure cleaner

- Leave the ignition "OFF". Rocker switch (1A) to „0“.
- Start cleaning

Usage as a hot water high pressure cleaner

- Set the target temperature or switching duration on the thermostat (see page 6), min. 40 °C, and than switch the ignition "ON" (rocker switch).The oil burner starts to work. The water is heated up and kept at the temperature you have set.

During high-pressure operation (above 30 bars) the temperature may not exceed 90 °C.

Steam level

To reach the steam level, i.e. over 90 ° C water temperature, open the right cover on the housing (see page 14) and adjust the pressure or water quantity on the hand wheel (4) downward and use the thermostat with rotary switch to select the temperature up to a maximum of 150 °. In the case of machines with hose drums, the high pressure hose must always be unwound completely.

During steam operation the pressure may not exceed 30 bars.

Usage with detergents

- The detergent must have the ph-value 7-9 neutral.
- Wait until the pump has pressed the air out of the lines.
- Put the chemical filter into a container with detergent.
- Open the detergent valve.
  The pump now draws detergent in and mixes it with the high pressure spray.
- Set the desired concentration of detergent.
- **At the end of the working procedure with detergent reset the rotary button to „O“.**
- **When the high pressure cleaner is operated with open chemistry valve without chemicals, the pump sucks in air. Damages caused to the pump as a result are not covered by the guarantee.**

Comply with additive manufacturers' instructions (e.g. protective equipment and waste water regulations). Use only additives approved for use with high pressure cleaners. Using other additives impairs the safety of the machine.
In the interest of the environment and to keep expenditure down, we recommend sparing use of detergent. Please observe the recommendations of the detergent manufacturer.
After using detergents, rinse the machine for approx. 2 minutes by pressing the trigger of the spray gun.

Decommissioning

- Switch off the master switch (position "0").
- Pull the plug out of the power socket.
- Turn off the water supply.
- Open the gun until the pressure is gone.
- Lock the gun.
- Disconnect the water hose.
- Slacken the connections of the high pressure hose and gun and unscrew the high pressure hose from the machine (appliances without hose drum).

Anti-Freeze Protection

The machine is normally still partially filled with water after work has been completed. It is therefore necessary to take special precautions to protect the machine from frost.

- **Completely empty the machine of water**
  Disconnect the machine from the water supply and switch off the ignition. Switch on the master switch and open the gun. The pump now presses the remaining water out of the heating coil. Do not allow the machine to run for longer than a minute without water.
- **Fill the machine with anti-freeze**
  If the machine is not in use for lengthy periods of time, it is advisable to pump anti-freeze into the machine, especially in winter. For this purpose, fill the antifreeze agent into the water box and turn on the machine without ignition (rocker switch to „0“). Wait with opened gun, until the agent comes from the nozzle.

However, the best protection against frost is to keep the machine in a place that is safe from frost.

Care and Maintenance

Care and maintenance is required to keep the machine in good working order, and to allow you to enjoy the machine for as long as possible.

IMPORTANT!!!

Always remove the plug before working on the machine!

Only use original Kränzle spare parts

What to do!

- Weekly, or after approx. 40 hours of operation

- Check the oil level of the high pressure pump.
  Loosen the red oil stopper on the high pressure pump and pull out the oil measuring rod.

  If the oil level is too low, add oil until the oil level is between the two markings on the oil measuring rod.

  Change the oil if it has a grey or whitish appearance. The oil should be disposed of responsibly.
- Check the filter in front of the float valve in the water tank and the fuel filter in front of the solenoid valve. Clean the filters if necessary.

- Yearly, or after approx. 500 hours of operation

- Desulphurise and decarbonize the heating coil.
- Check the oil burner and ignition system.
  Clean the oil nozzle, oil filter, solenoid valve and filter, clean and adjust the ignition transformer, ignition cable and ignition electrodes and replace defective parts.
- Change the oil

Operating hour meter

The cleaner is equipped with an operating hour meter.

If during normal operation the momentary operating mode button ("°C" or "%") is actuated for more then 2 seconds, the operating time of the pump is displayed for 5 seconds and afterwards the combustion time for 5 seconds as well. Thereafter the display shows the original values again.

As long as the operating hours are displayed the buttons for temperature regulation and operating mode selection are blocked.

The operating time is displayed in hours [h] either in the "TARGET" or in the "ACTUAL" window. The 1000 and 100 hours are displayed in the "TARGET" window and the 10, 1 and 1/10 hours in the "ACTUAL" window.

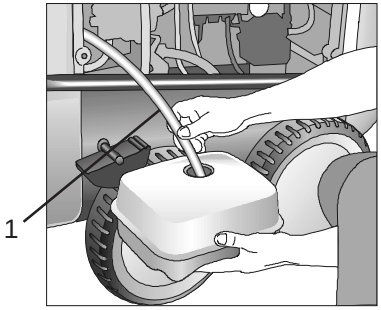
Pump operating time: Target-Display: P 9 9 Actual-Display: 9 9. 9 for 9 999,9 hrs

Combustion time: Target-Display: F 9 9 Actual-Display: 9 9. 9 for 9 999,9 hrs

e.g.: F00 27.3 = Cumbustion time 27 hours and 18 minutes

Changing the oil

To do this, take the oil drainage hose (1) connected to the oil drain screw, from the inside of the machine and open the red oil filler cap on the top side of the black oil reservoir. Open the cap at the end of the hose. Drain off the oil into an oil pan and dispose of it responsibly. Close the end of the hose.
Refill with oil as described above.



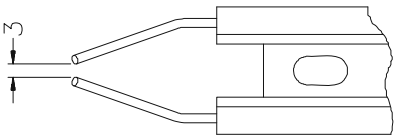
Oil leakage

If oil leaks out, go to the nearest customer service (dealer) immediately. (Environmental damages, transmission damages, loss of guarantee.)

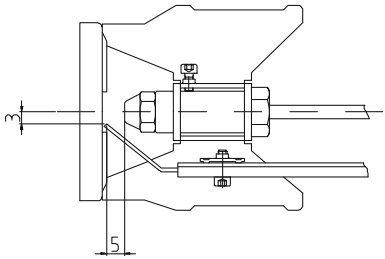
Type of oil: Formula RS of Castrol - Quantity: 1.0 l

Adjusting ignition electrodes

For a smooth ignition, the setting of the ignition electrode must be controlled regularly.



Check distance in mm



Fuel System

Your fuel may contain particles of dirt, or impurities or water may get into the tank during refuelling. Check the tank for impurities on a regular basis. Clean the tank when necessary

Empty the fuel tank using the drainage screw at the bottom of the tank. Clean the tank and fuel lines. Clean tank and fuel lines carefully and check to see whether there are water droplets on the inside of the tank, because these must be removed.

Detergent and dirty fuel must be disposed of responsibly.

Decalcifying the heating coil

Calcified machines use an unnecessary amount of energy because the water can only be heated slowly and the excess pressure valve feeds a part of the water back into the pump circuit.

Calcified machines can be recognised by increased pipeline resistance.

Check pipeline resistance by disconnecting the high pressure lance from the gun and switching the machine on. A full jet of water emerges from the gun. The machine must be decalcified if the pressure shown on the manometer is greater than 25 bars.

Decalcifiers are caustic!

Observe the instructions for usage and accident prevention. Wear protective clothing to prevent the decalcifying agent from contacting your skin, eyes and clothing (e.g. gloves, safety mask etc.)

Proceed as follows to decalcify the machine:

- Unscrew the high pressure hose from the machine and decalcify it separately.
- Put the detergent suction hose into a container of decalcifying solution.
- Set the dispenser valve to the maximum concentration.

  Switch on the machine.
- Hold the gun in a separate container and press the trigger.
- Wait for about a minute until the decalcifier comes out of the gun (recognisable by its whitish colour).
- Switch off the machine and allow the solution to act for about 15-20 minutes.
- Switch the machine back on and rinse it through with clear water for about 2 minutes.

Now check whether pipeline resistance is back to an acceptable level. Repeat the decalcifying process if the pressure without the high pressure lance is still above 25 bars.

Rules, directives, inspections

- **Inspections performed by Kränzle**
  - measurement of earth line resistance
  - measurement of voltage and current
  - inspection of tension consistency with +/- 1530 V
  - pressure check of heating coil at 300 bar
  - visual and functional check as per the inspection sheet provided
  - exhaust fume analysis (see test strips provided)
- **Guidelines for liquid sprayers**

  The machine conforms with the "Guidelines for liquid sprayers". These guidelines are issued by the organisation of trade associations and may be obtained from Carl Heymann-Verlag KG, Luxemburger Str. 49, 50939 Köln. These guidelines specify that this machine is to be inspected by qualified personnel whenever necessary, but no less than once every 12 months. These inspections must be recorded in the inspection log at the end of this manual.
- **Pressure container and steam boiler directives**

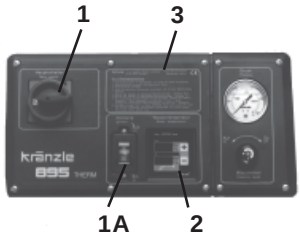
  Kränzle high pressure cleaning equipment conforms to the pressure container and steam boiler directive. No construction approval, notification of licence and takeover inspection are required. The water capacity is less than 10l.
- **Duties of owner**

  The owner is to ensure that all safety-relevant components are in a serviceable condition before the sprayer is used. (e.g., safety valves, hose and electric cables, spray equipment etc).
- **Emission control legislation**

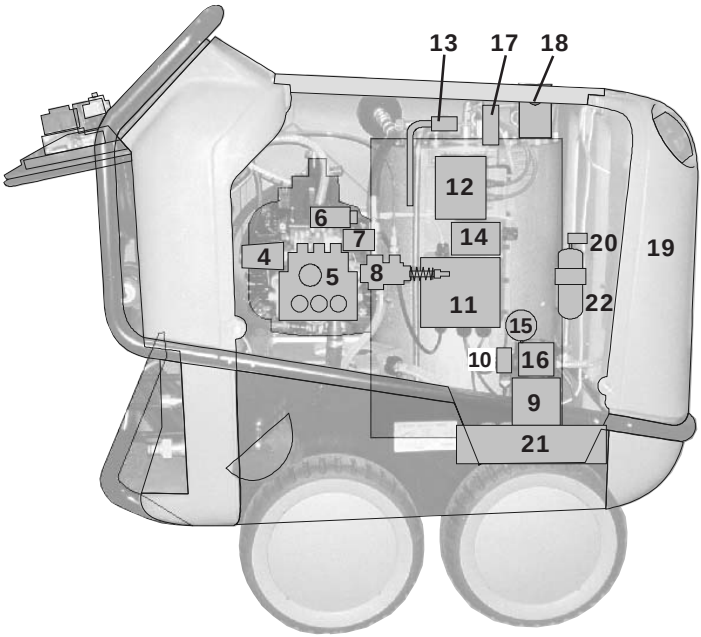
  With stationary installation, the emission levels of the machine must be checked once a year by a qualified organisation or person according to German law. The first inspection must be carried out four weeks after the machine is commissioned. The owner is responsible for having the inspection performed.

IMPORTANT!!!

Always remove the plug before working on the machine!



1 Master switch
1A Ignition “ON/OFF
2 Thermostat
3 Brief operating instructions



4 Hand wheel for pressure adjustment
5 High pressure pump
6 Pressure switch black (start solenoid valve)
7 Pressure switch red (start pump)
8 Safety valve
9 Motor for ventilator and fuel pump
10 Solenoid valve (Fuel)
11 Terminal box
12 Ignition transformer
13 Thermosensor water
14 Excess temperature release
15 Fuel manometer
16 Fuel pump
17 Ignition electrodes
18 Thermosensor exhaust gas
19 Fuel tank
20 Ball cock fuel
21 Ventilator
22 Fuel filter

Cold water mode

1. Connect to water supply and determine whether the water tank fills up completely and the float valve stops.

2. Ignition (switch 1A) to OFF.

3. Main switch to ON.

4. Open high pressure gun. The pump sucks water from the water tank and moves the water through the heating coil to the lance, the pressure is increased.

After you close the gun, press the red pressure switch (7). The 37-Second-Stop system is activated, i.e. after closing the gun, the pump motor is turned off after 37 seconds. When you open the gun the motor starts again.

If the gun stays closed for more than 20 minutes, the safety switch off is activated and the machine is turned off completely, i.e. if you want to use the machine you must first turn it OFF and then ON with the main switch.

ATTENTION!!
If the pressure is not built up immediately, there is still air in the pump. Open and close the gun repeatedly to press the air from the machine.

Hot water mode

Start the machine just like in cold water mode and then turn the rocker switch for the burner to ON. Then, turn the thermostat, (2) located on the front, to the desired temperature (at least 40 °C) or %-operating time, in order to activate the burner, i.e., that fuel is injected.

The manometer (15) on the fuel pump shows approx. 10 bars. If this display is missing, check whether
1. there is heating oil in the tank
2. the fuse in the terminal box (11) for the motor (9) has blown.
3. the fuel sieve (22) or the fuel sieve in the pump (16) is dirty.
4. the ball cock (20) is closed.
5. the fuel pump does no operate smoothly or is blocked.
6. the ventilator jams.

The thermostat grants permission to open the solenoid valve; after opening the gun, the burner starts. If the solenoid valve is open, the fuel pressure is approx. 10 bars. The burner starts and heats the water to the temperature preset by you.
In the t*emperature mode* the burner switches off as soon as the temperature is reached. If the temperature drops again, the burner switches on automatically.
In the *percentage mode* the burner cyclically switches on/off after a certain time, depending on the set percentage value.

In the temperature mode the thermostat is controlled by a thermosensor, mounted to the outlet of the heating coil.

In the electro distributor box (11) mounted to the combustion unit, there is a fuse, which protects the motor (9) for fuel pump and ventilator. If the motor is overloaded, the fuse blows. This can happen when the fuel pump is blocked or does not work freely, when the ventilator is blocked or does not operate freely or when there is an electrical problem.

There is a thermosensor (18) in the waste gas tube, which controls an excess temperature relay with trigger function (4), i.e. when the exhaust gas temperature in the chimney increases above 250 °C, this relay triggers. To activate it again, you must wait until the combustion unit has cooled down, i.e. approximately 15 minutes. Then, you can press the button under the cover (14) again. The excess temperature relay can trigger when the machine is operated over a longer period in the highest steam level, or when there is lots of soot on the heating coil due to poor combustion, or when the inside of the heating coil is calcified, so that there is no ventilation (cooling).

As further safety function, the burner is also switched off, when the water temperature exceeds 150 °C.

Display in field		Cause	Remedy
TARGET	ACTUAL		
Err	OFF	Water temperature at outlet of combustion chamber above 147 °C	Operate cleaner without heating „Heating OFF“ until temperature has dropped below 147°C. Switch master switch to „OFF“ and then to „ON“ again.
AUS	E7	Cleaner has not been operated for more than 20 minutes -> Safety cut-out	Switch master switch to „OFF“ and then to „ON“ again.
Err	E2	Temperature sensor defective	Replace temperature sensor
FLA	Actual value	Warning Flame monitoring; For 2 seconds no combustion was recognized by the flame sensor	Check flame sensor; check combustion system Switch master switch to „OFF“ and then to „ON“ again.
OIL	Actual value	Fuel level in tank too low	Refill fuel (Heating fuel oil EL)

Troubleshooting

IMPORTANT!!!

Always remove the plug before working on the machine!

Malfunction	*Cause of malfunction / Trouble shooting*
Water supply	
Water tank runs over.	Float valve is dirty. Float valve is defect.
Water tank does not fill completely.	Water filter is dirty. Check water inlet quantity.
Pump does not suck.	Valves stick or are dirty. Suction hose leaks.
	Chemistry valve is open or leaks.
	Check hose clips (connections). High-pressure nozzle is clogged.
Test: check water and chemical system for tightness.	Connect water inlet directly to the pump (2-4 bar pre-pressure).
High-pressure pump	
Pump makes lots of noise. Operating pressure is not reached.	Pump sucks air. Check suction connections. Check high-pressure nozzle. Check valves. Check O-rings under valves. Check sleeves. Manometer is defect. Unloader: check stainless steel seat and ball. Check seals on the control piston.
Water drops from the pump.	Replace sleeves in the pump. Replace O-rings.
Oil drops from the transmission.	Check oil seals (replace). Check plunger and plunger guides. Check water supply, since water deficiency or air suction can cause damage to seals and O-rings (chemistry valve leaks?).
	Worn high pressure nozzle
Pressure is too low	Stainless steel seat, ball, O-ring in unloader is dirty or defect.
	Manometer is defect
Machine does not switch off	
Test: Disconnect pressure switch (red) bridge on the panel between terminal 5 + 6	Check return body and O-ring in unloader of the valve housing.
	Check pressure switch (red). Check micro switch.
	Check cable connections.
	Board is defect.

Troubleshooting

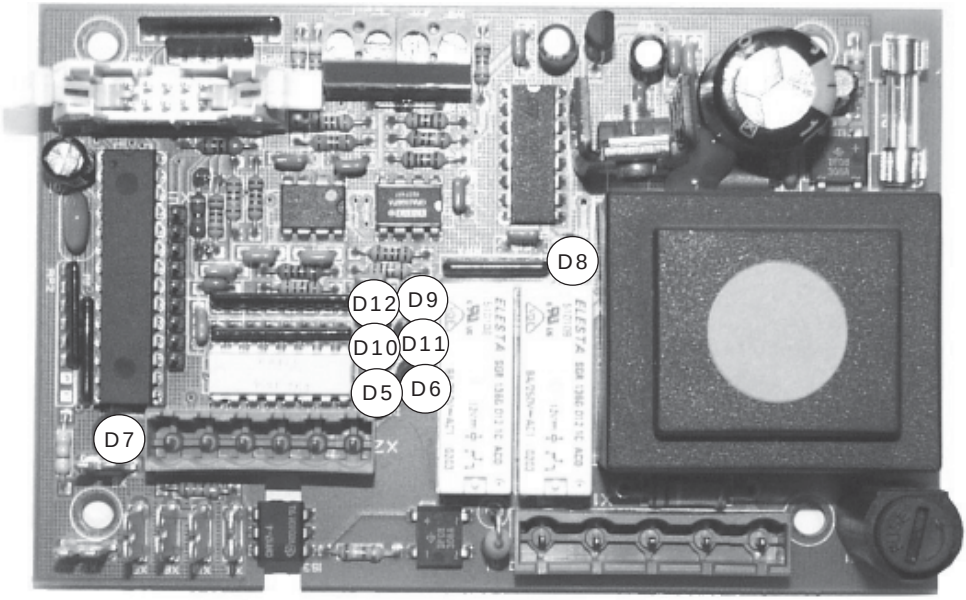
Malfunction	*Cause of malfunction / Trouble shooting*
Machine does not start	Check electricity supply. Check main switch. Check cable connections. Check board. Check pressure switch. Switch off by overcurrent release.
Heating (burner)	
Fuel pump/blower operates, but burner does not heat.	Set water temperature is reached. Increase temperature on thermostat with rotary control switch. Open gun, until temperature drops. Fuel tank is empty. Fuel filter is dirty. Fuel nozzle is dirty. Float switch in fuel tank is defect.
Fuel pump/blower does not operate. - Pump makes lots of noise	Blower/fuel pump motor is defect. Check electrical equipment.
- Fuel operating pressure has not been reached	Check fuse in terminal box. Coupling between burner motor and fuel pump is defect.
Coupling between burner motor and fuel pump is broken	Water in fuel tank. Dirt or rust in the fuel pump. Clean tank. Replace fuel pump.
Solenoid valve on the fuel pump does not open Test: Pressure switch (black) Bridge in terminal box between terminal 3 +4 Test: Connect solenoid valve 230 V externally	Check pressure switch (black). Solenoid valve is defect or dirty.
Oil pressure on the fuel pump is too low	Clean filter, clean supply line, clean fuel pump. Setting is wrong.
too high	Clean fuel nozzle, or replace it.

Troubleshooting

Malfunction	*Cause of malfunction / Trouble shoooting*
Ignition does not function	Check ignition cable. Charring of plug-in contacts by moisture. Cable is broken Check ignition transformer connections. Transformer is defect Ignition electrode has been falsely set or burnt up.
Ventilator does not operate	Blower-/fuel pump motor is defect. Check electrical equipment. Check fuse in terminal box. Coupling between burner motor and fuel pump is defect.
Burning Smoke during operation Smoke after switching off	Fuel is dirty. Nozzle or nozzle stock leaks. Water in tank.
Spray gun - High-pressure hose Gun drips High pressure hose drips Nozzle is clogged	Check for leakages. Replace seals. Replace O-ring under screwed connection. Manometer indicates pressure, but no water comes out of HP-hose – clean nozzle.
Sucking detergent Detergent is not sucked	Pump sucks air. Check hose clips. Test: Connect water line to the pump. Water inlet: 2 - 4 bar pre-pressure. No water must come from the detergent hose.

Diagnosis

...using light diodes on control panel



DANGER !!!

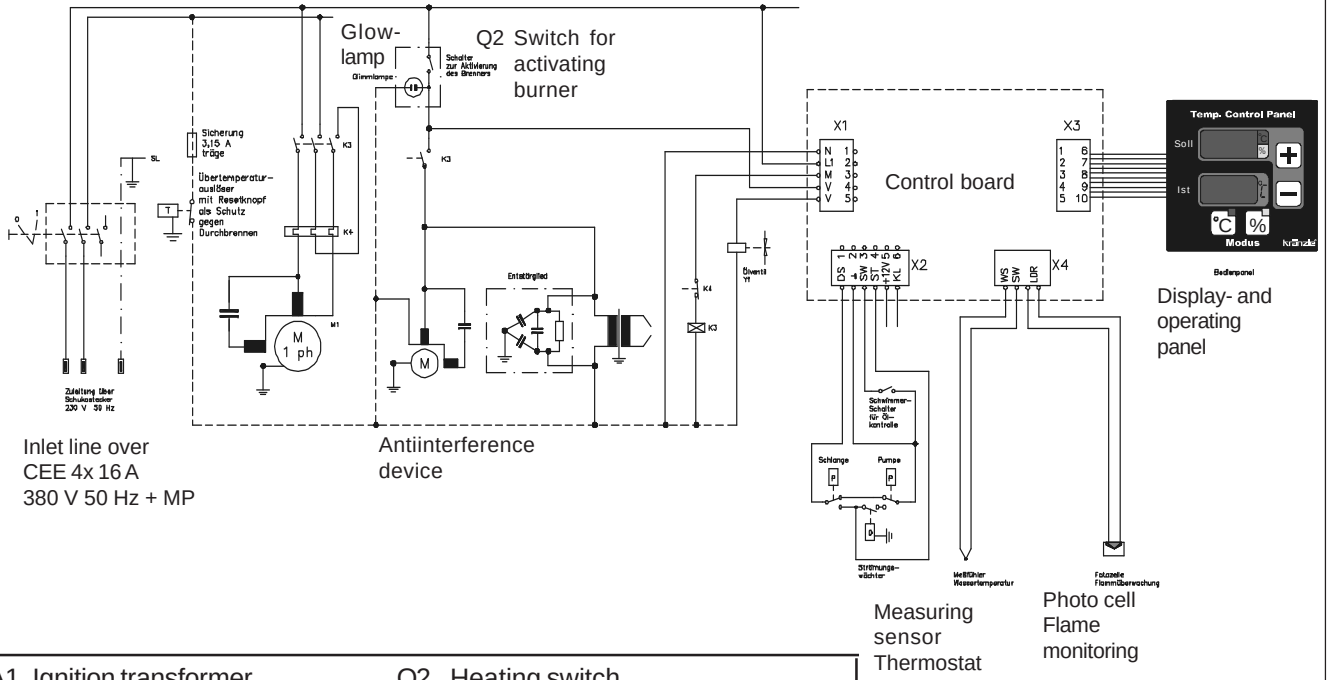
When controlling the light diodes the appliance must be connected to the electric mains.

Watch out and proceed extremely carefully!

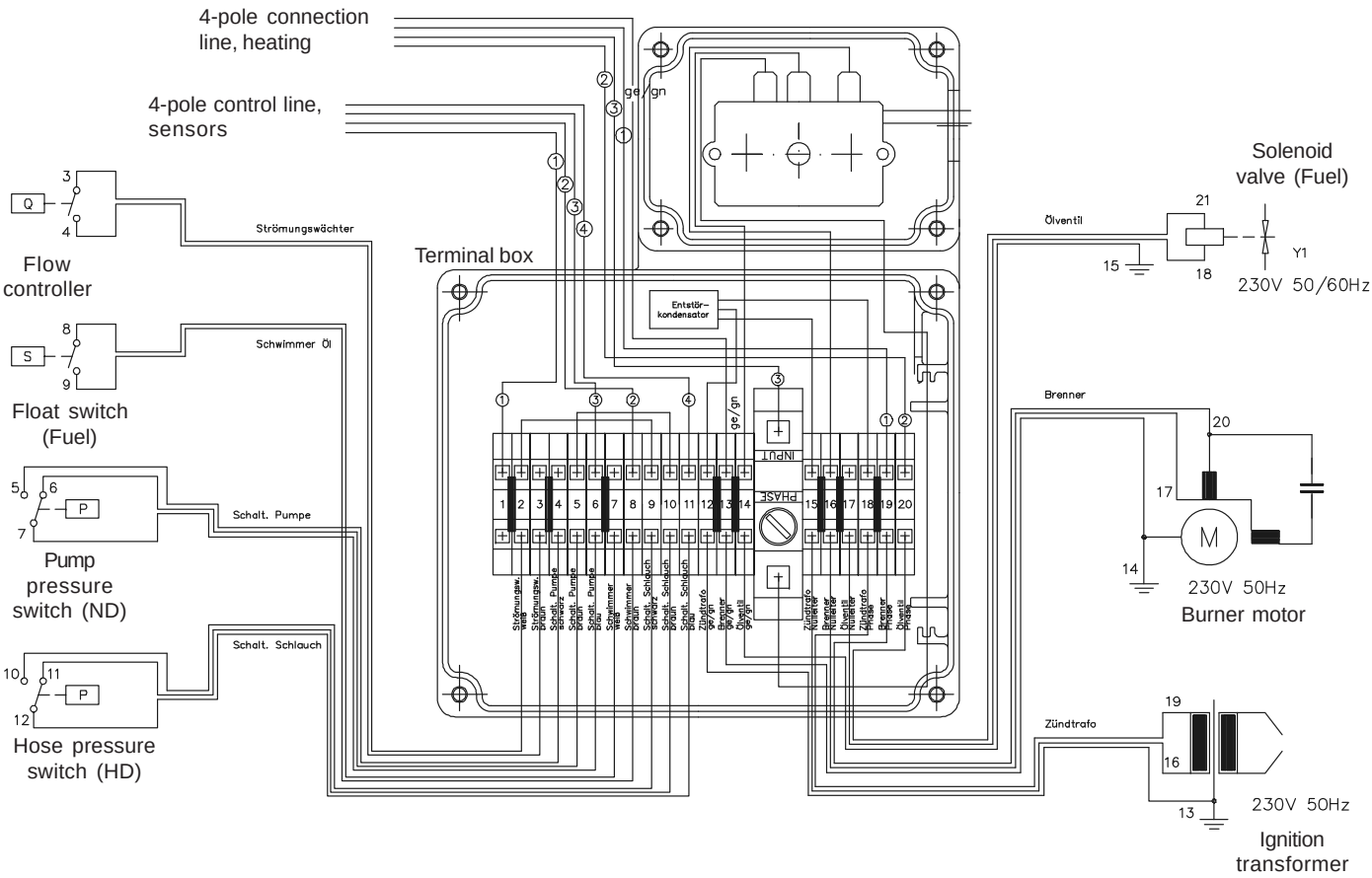
Disconnect the appliance from the mains as soon as possible.

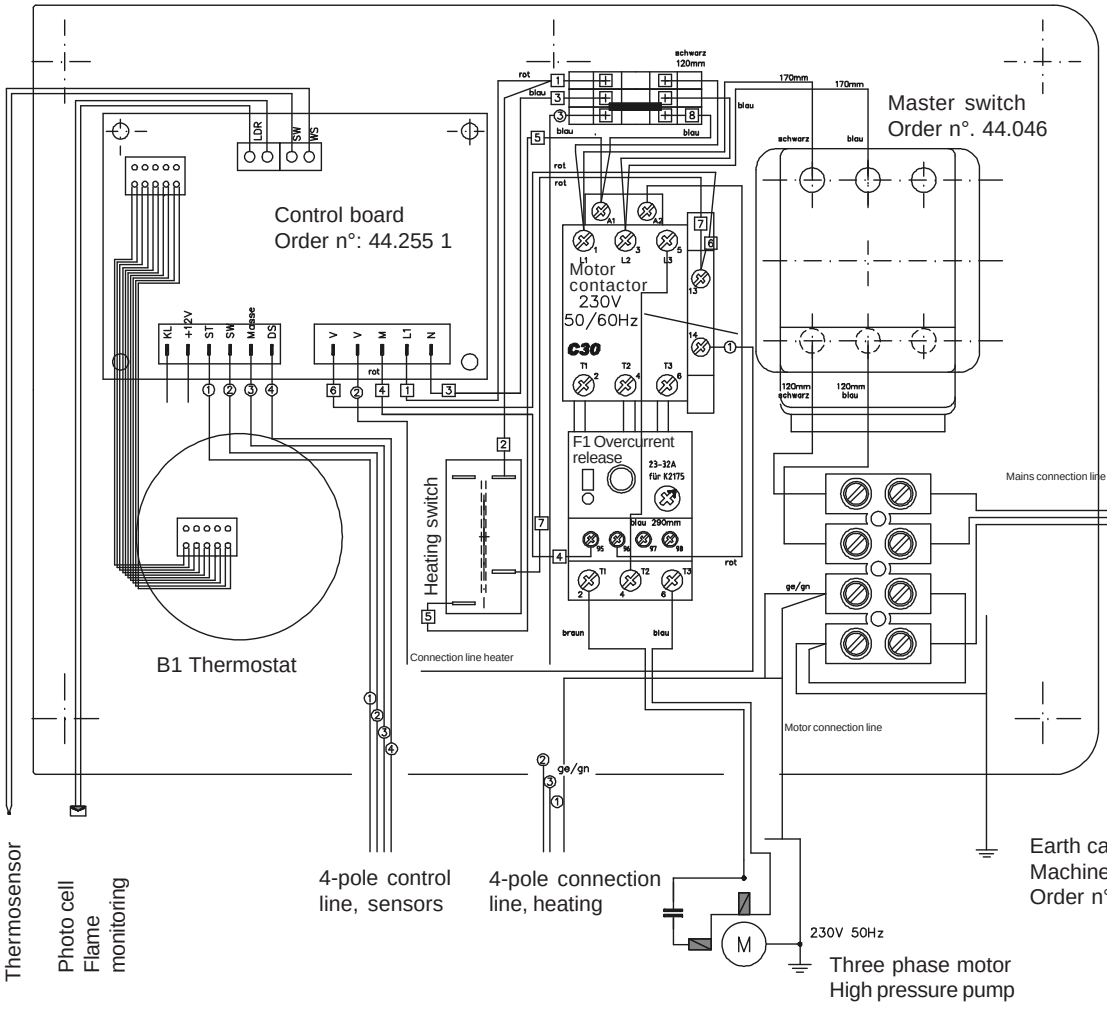
Pull mains plug !!!!

Diode	Illuminates when	
D5	Low fuel level	Sensor input
D6	Motor start-up allowed - Pressure switch and flow controller closed	
D7	Having started the appliance the diode D7 must light up immediately, otherwise check fuses F1 and F2 on the board.	
D8	Motor start-up allowed - heating coil pressure switch (S5) in rest position or re-run delay active	Control output
D9	Solenoid valve release allowed	
D10	Burner start-up allowed - Thermostat (B1), flow controller (S2) and pump pressure switch (S3) have actuated	
D11	Flame monitoring system not released	
D12	Safety cut-out after 20 minutes	

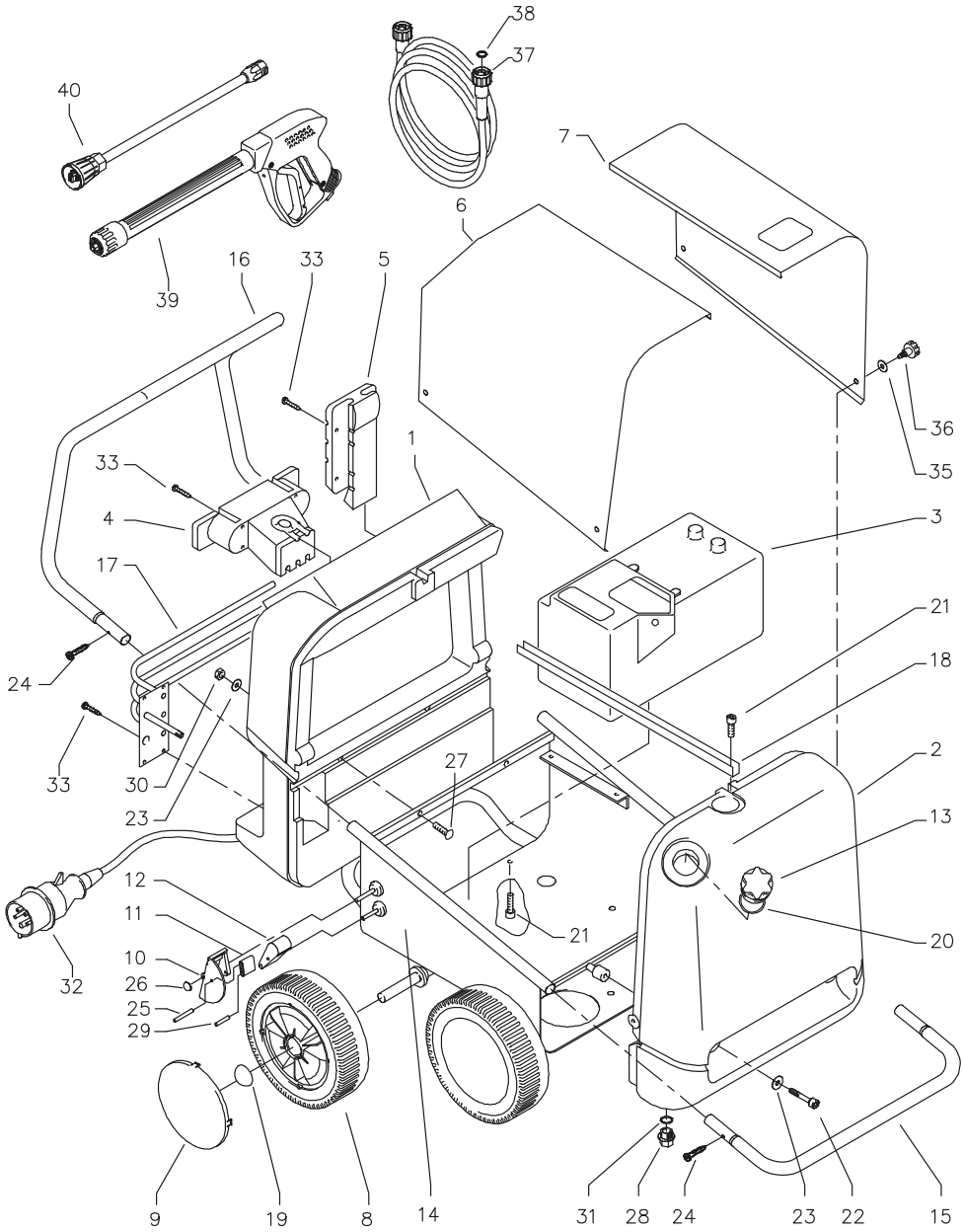


Á1 Ignition transformer	Q2 Heating switch
B1 Thermostat	S2 Flow controller
F1 Excess current actuator	S3 Pump press switch (LP)
F2 Excess temperature release	S4 Float switch (fuel)
F3 Fuse 3.15 timelag	S5 Hose press switch (HP)
K3 Motor contactor	S10 Thermosensor
M1 3-phase AC motor, HP pump	Y1 Fuel valve
M2 Burner motor	
Q1 Master switch	


4-pole connection line, heating
4-pole control line, sensors
Terminal box
Entstör-kondensator
INPUT
PHASE
Flow controller
Strömungswächter
Float switch (Fuel)
Schwimmer Öl
Pump pressure switch (ND)
Schalt. Pumpe
Hose pressure switch (HD)
Schalt. Schlauch
Solenoid valve (Fuel)
Ölventil
Y1
230V 50/60Hz
Brenner
230V 50Hz
Burner motor
Zündtrafo
230V 50Hz
Ignition transformer

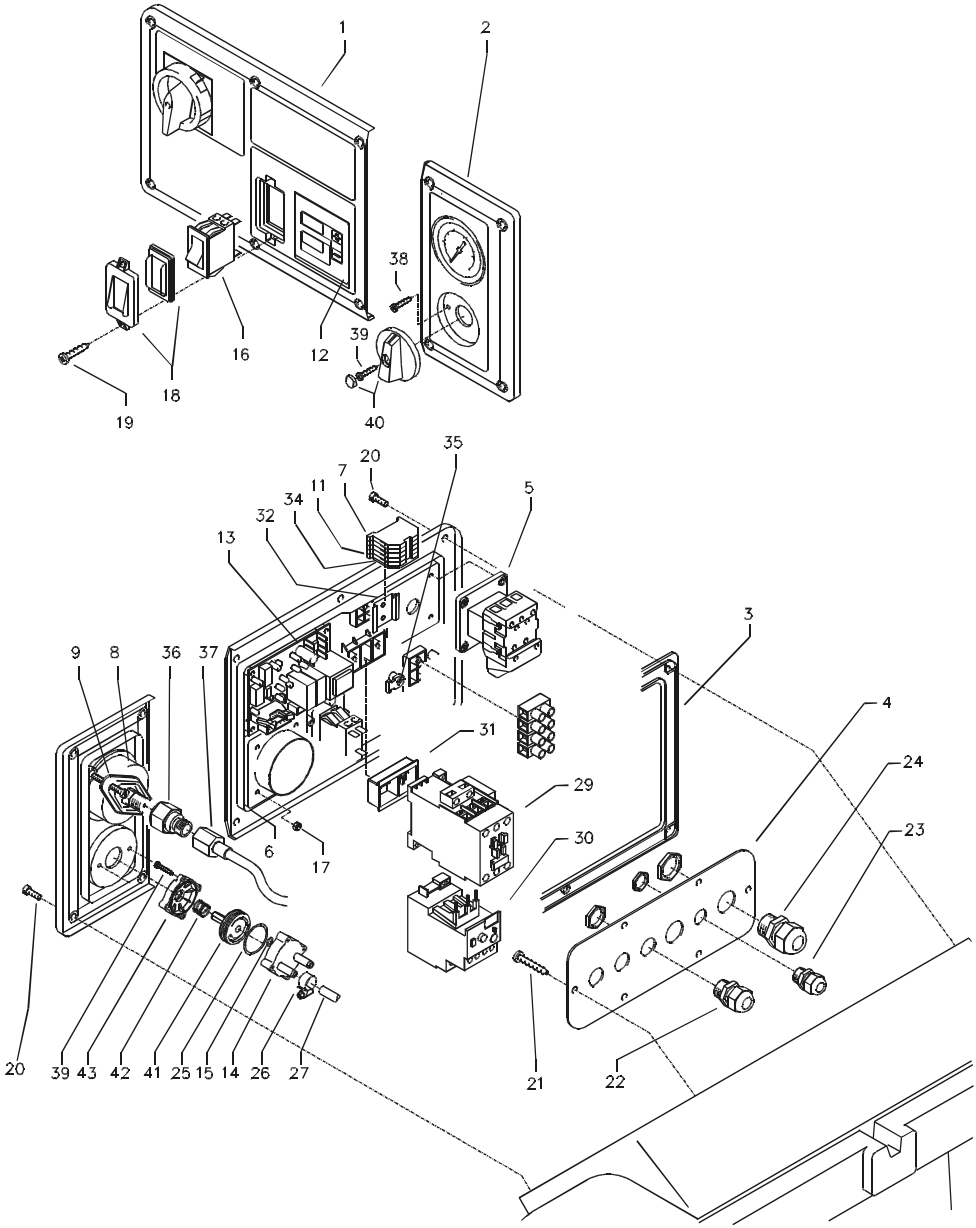

blau = blue
braun = brown
grün = green
ge/gn = yell/green
rot = rot
schwarz = black
Control board
Order n°: 44.255 1
Master switch
Order n°. 44.046
Motor contactor
230V
50/60Hz
C30
F1 Overcurrent release
23-32A
für K2175
Heating switch
B1 Thermostat
Mains connection cable
Order n°: 44.036
Mains connection line
Connection line heater
Motor connection line
Earth cable
Machine frame
Order n°. 44.038
Thermosensor
Photo cell
Flame
monitoring
4-pole control
line, sensors
4-pole connection
line, heating
230V 50Hz
Three phase motor
High pressure pump

Complete Assembly



No.	Description	Qty.	Order No.
1	Cockpit	1	44.006
2	Brennstofftank	1	44.004
3	Wassertank	1	44.009
4	Kabelaufwicklung	1	44.007
5	Lanzenköcher	1	44.008
6	Haube rechts	1	44.032
7	Haube links	1	44.031
8	Rad	4	44.017
9	Radkappe	4	44.018
10	Bremspedal	1	44.022
11	Bremshebel	1	44.023
12	Bremsklotz	1	44.024
13	Tankdeckel	1	44.005
14	Fahrgestell	1	44.001
15	Frontbügel	1	44.002
16	Schubbügel	1	44.003
17	Reeling	1	44.016
18	Top-Strebe	1	44.019
19	Starlock-kappe 20 mm	4	40.142
20	O-Ring 70 x 5	1	44.020
21	Innensechskantschraube M 8 x 12	4	40.122
22	Innensechskantschraube M 8 x 40	2	44.033
23	Unterlegschiebe 8,4 DIN 9021	4	41.409
24	Schraube 3,9 x 16	4	12.150
25	Stift 6 x 50	1	44.035
26	Starlockkappe 8 mm	1	44.165
27	Schloßschraube M 8 x 35	2	41.408
28	Ablaßschraube Brennstofftank	1	44.004 1
29	Stift 6 x 40	1	44.035 1
30	Elastic-Stop-Mutter M 8	2	41.410
31	Dichtung für Ablaßschraube	1	41.047 1
33	Kunststoffschraube 6 x 30	12	43.423 1
35	Scheibe	4	44.034
36	Sterngriff	4	50.168 1
37	Hochdruckschlauch NW 8 10 m	1	41.081 3
37.1	Hochdruckschlauch NW 8 20 m	1	41.083 3
38	O-Ring 9,3 x 2,4 Viton	2	13.273 1
39	Gun with extension - Starlett II	1	12.320 2
40	Lance with flat jet nozzle 25045	1	12.392-D25045

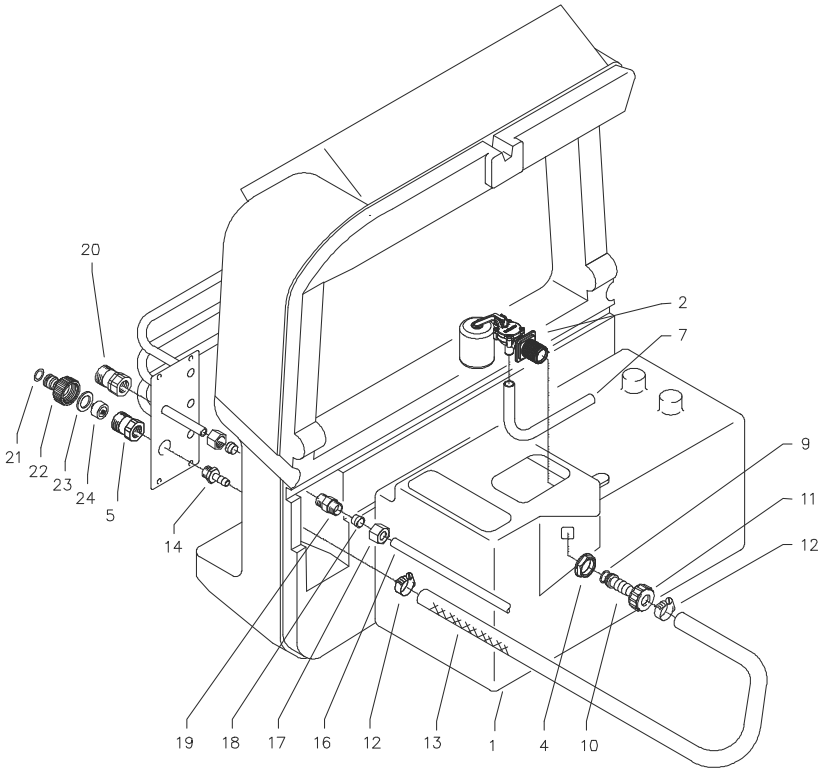
Electronics switchbox



Spare parts list KRÄNZLE therm
Electronics switchbox

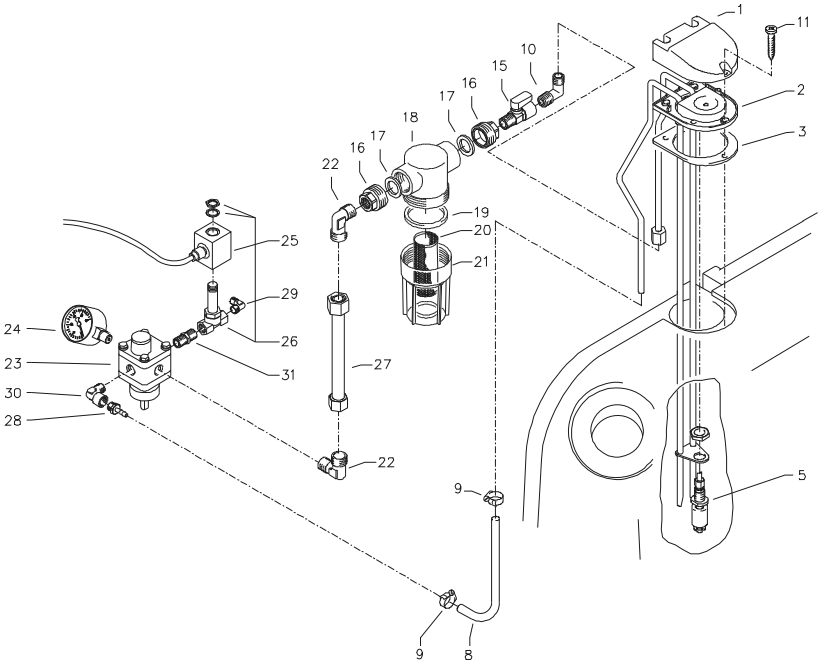
No.	Description	Qty.	Order No.
1	Frontplatte Elektrik	1	44.042
2	Frontplatte Manometer	1	44.043
3	Gummidichtung Elektrik	1	44.044
4	Kabeldurchführungsplatte	1	44.045
5	Hauptschalter KG32B T203/01E	1	44.046
6	Dichtung für Thermostat	1	44.101 1
7	Klemme Wago 2,5 mm²	1	44.047
8	Manometer	1	15.039 1
9	Klemmbügel für Manometer	1	44.049
11	Erdungsklemme Wago 2,5 mm²	1	44.048
12	Bedienteil für Steuerplatine	1	44.257
13	Steuerplatine ohne Bedienteil	1	44.255 1
14	Gehäuse Waschmittelventil	1	44.145
15	O-Ring 5 x 1,5 (Viton)	1	44.150
16	Heizungsschalter	1	41.111 6
17	Elastic-Stop Mutter M 4	4	40.111
18	Klemmrahmen mit Schalterabdichtung	1	41.110 5
19	Kunststoffschraube 3,5 x 9,5	2	41.088
20	Schraube M 5 x 14	10	40.536
21	Kunststoffschraube 5,0 x 14	6	43.426
22	PG-Verschraubung PG 11	3	41.419
23	PG-Verschraubung PG 9	1	41.087
24	PG-Verschraubung PG 16	2	41.419 1
25	O-Ring 28,24 x 2,62	1	44.149
26	Schlauchklemme 9 - 9	2	44.054
27	Kunststoffschlauch für Waschmittelansaugung	1	44.055
28	Kunststoffschlauch mit Filter	1	44.056
29	Motorschütz C30 für 3x 230V / 50/60Hz	1	44.400 2
30	Thermorelais 193-EEEB 5,4- 27 A	1	44.401 0
31	Hutschiene 50 mm lang	1	44.125 1
32	Hutschiene 30 mm lang	1	44.125 2
33	Blechschraube 3,9 x 9,5	16	41.636
34	Verschlußdeckel für Durchgangsklemme	1	44.047 2
35	Kabelhaltesockel	5	44.135
36	Anschlußmuffe Manometer	1	44.136
37	Druckmeßleitung	1	44.102
38	Blechschraube 3,5 x 19	2	44.162
39	Blechschraube 3,5 x 16	3	44.161
40	Drehgriff Chemieventil mit Blendkappe	1	44.151
41	Regulierkolben Chemieventil	1	44.147
42	Edelstahlfeder 1,8 x 15 x 15	1	44.148
43	Deckel für Chemieventil	1	44.146
44	Lüsterklemme 4x 16mm²	1	44.248
	Chemical valve compl. Pos. 14; 15; 25-27; 39-43		**44.052**
F1	Fuse T 32 mA	1	44.200 1
F2	Fuse M 250 mA	1	44.200 2

Water supply



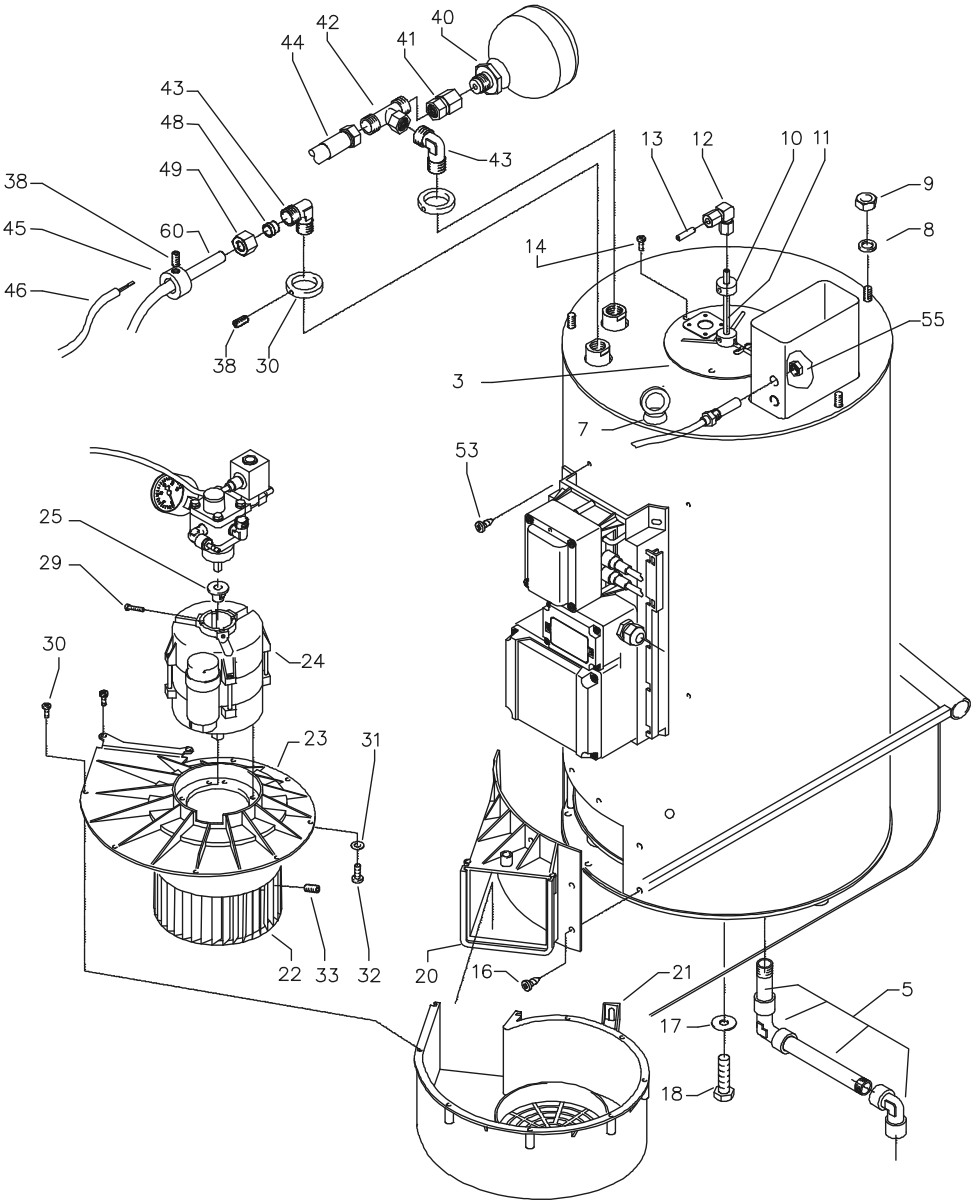
No	Description	Qty.	Ord.-No
1	Wassertank	1	44.009
2	Schwimmerventil	1	46.250 5
5	Anschlußstück R 3/8" IG	1	41.423
7	Einströmschlauch	1	44.027
9	O-Ring 13 x 2,6	1	13.272
10	Schlauchtülle	1	44.126
11	Überwurfmutter	1	41.047
12	Schlauchschelle 12 - 22	2	44.054 2
13	Wassereingangsschlauch	1	44.028
14	Schlauchtülle R3/8" x 13	1	44.029
16	Ermetorohr 12 mm	1	44.030
17	Ermetomutter 12 mm	2	40.075
18	Klemmhülse 12 mm	2	40.074
19	Ermetoverschraubung 12 L x 12 L	1	44.060
20	Wasserausgangsteil	1	44.061
21	O-Ring	1	41.047 3
22	Steckkupplung	1	41.047 2
23	Gummidichtung	1	41.047 1
24	Wasserfilter	1	41.046 2
	Plug-in connection compl. Pos. 21-23		**41.047 4**

Fuel supply



No	Description	Qty.	Ord.-No
1	Deckel Brennstoffversorgung	1	44.011
2	Flansch mit Brennstoffleitungen	1	44.010
3	Gummidichtung	1	44.012
5	Schwimmerschalter	1	44.014
8	Rücklaufschlauch	1	44.015
9	Schlauchschelle 7 - 11	2	44.054
10	Einschraubwinkelverschraubung 1/4" x 6	1	44.062
11	Schraube 5,0 x 25	3	41.414 1
15	Kugelhahn	1	44.203
16	Anschlußteil Brennstofffilter	2	44.214
17	Gummidichtung 3/4"	2	41.047 1
18	Filtergrundkörper	1	13.301
19	Gummidichtung	1	13.303
20	Siebkörper Brennstofffilter	1	44.213
21	Filterbecher	1	13.302
22	Einschraubwinkel R1/4" AG x 10L	2	40.121 1
23	Brennstoffpumpe mit Magnetventil	1	44.073
24	Brennstoffmanometer 0-15 bar R1/8"	1	44.082
25	Magnet für Magnetventil	1	44.251 1
26	Magnetventil	1	44.251
27	Abstandsrohr 128 mm	1	44.084
28	Schlauchtülle 1/4" x 6	1	44.053
29	Winkeleinschraubverschraubung 1/8" x 6	1	44.110 1
30	Winkeleinschraubverschraubung 1/4“ AG x 1/4“ IG	1	40.121
31	Doppelnippel 1/4“ x 1/4“	1	44.251 2
	Fuel filter compl. Pos. 15 - 21		**44.083**
	Fuel pump compl. Pos. 22-26, 28-31		**44.073 1**

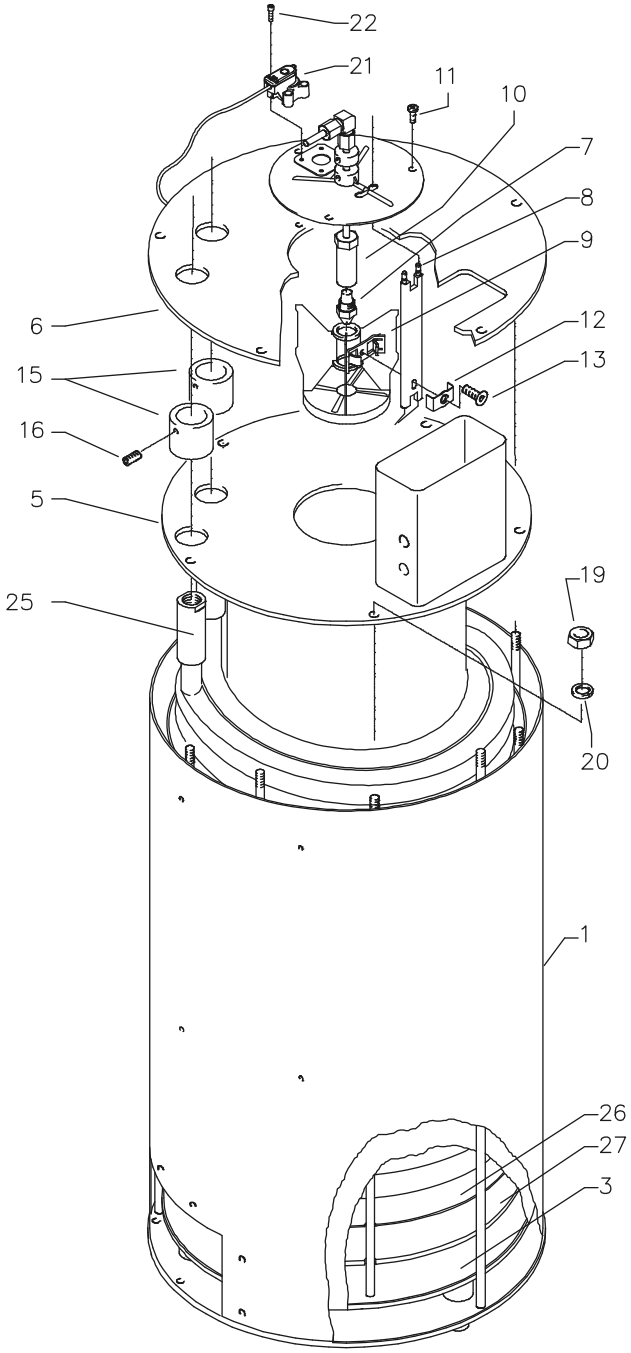
Combustion chamber



Spare parts list KRÄNZLE therm
Combustion chamber

No	Description	Qty.	Ord.-No
3	Deckel Düsenstock	1	44.079
5	Ablaufgarnitur	1	44.204
6	Ermetowinkel 2x R1/4" IG	2	44.127 1
7	Ringmutter M 8 DIN 582	3	44.115
8	Federring A 8	5	44.222
9	Edelstahlmutter M 8	2	14.127 2
10	Tiefenanschlag	1	44.088
11	Brennstoffleitung „Düsenstock“ 137 mm	1	44.089
12	Winkelverschraubung 6L x 6L	1	44.106
13	Brennstoffleitung Pumpe	1	44.108
14	Edelstahlschraube M 6 x 10	3	44.177
16	Blechschraube 6,3 x 13	7	44.109
17	Unterlegscheibe A 10,5 DIN 9021	3	50.182
18	Sechskantschraube M 10 x 20 DIN 933	3	44.116
20	Gebläsestutzen	1	44.068
21	Gebläsegehäuse	1	44.069
22	Lüfterrad	1	44.071
23	Gebläsedeckel	1	44.070 1
24	Brennermotor 220 V / 60 Hz	1	44.072 1
25	Steckkupplung	1	44.085
29	Zyl.schraube mit ISK M 5 x 12 DIN 912	1	40.134
30	Schraube 5,0 x 25	9	41.414 1
31	Unterlegscheibe 4,3	4	44.059
32	Senkschraube M 4 x 8	4	44.091
33	Gewindestift M 6 x 8 DIN 914	2	44.090
40	Hydrospeicher	1	44.140
41	Anschlußmuffe für Hydrospeicher	1	44.140 1
42	Einstellbare T-Verschraubung	1	44.141
43	Einschraubwinkelverschr. 3/8" x 12L	2	44.092
44	Hochdruckschlauch	1	44.093
45	Klemmring für Meßleitung Thermostat	1	44.087 1
46	Meßleitung Thermostat	1	44.101 2
48	Schneidring 12 mm	1	40.074
49	Überwurfmutter f. Ermeto 12 mm	1	40.075
50	Ermetorohr	1	44.030
51	Abschlußring	2	44.086
52	Gewindestift M 6 x 8 DIN 914	7	44.090
53	Blechschraube 4,8 x 13	4	44.112
55	Mutter	1	44.172

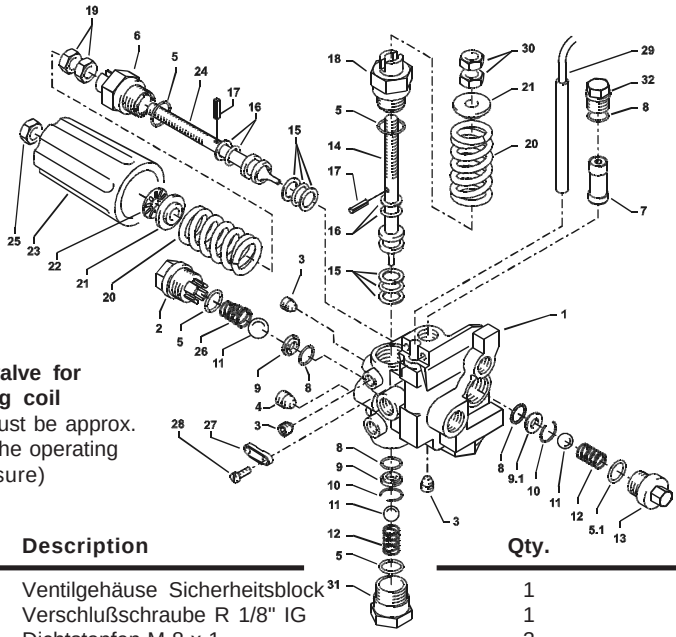
Combustion chamber



Spare parts list KRÄNZLE therm
Combustion chamber

No	Description	Qty.	Ord.-No
1	Außenmantel mit Grundplatte	1	44.063
3	Innenmantel mit Bodenplatte	1	44.064 1
5	Innendeckel	1	44.065
6	Außendeckel	1	44.066
7	Brennstoffdüse 60° B 1,50 gph	1	44.077
8	Blockelektrode	1	44.080
9	Düsenstock Ø 25 mm, 6 Schlitze	1	44.076 4
10	Düsenhalter	1	44.078
11	Edelstahlschraube M 6 x 10	3	44.177
12	Klemmblech für Elektrode	1	44.076 1
13	Zyl.schraube mit ISK M 5 x 15 DIN6912	1	44.076 2
15	Abschlußhülse	2	44.081
16	Gewindestift M 6 x 8 DIN 914	2	44.090
19	Edelstahlmutter M 8	7	14.127 2
20	Federring A 8	7	44.222
21	Flammsensor optisch	1	44.256
22	Schraube M 4 x 10 DIN912	4	46.002
25	Heizschlange	1	44.226
26	Flammprallplatte Edelstahl	1	44.224
27	Isolationsplatte	1	44.223
	Heating coil with inner mantle	**1**	**44.064**

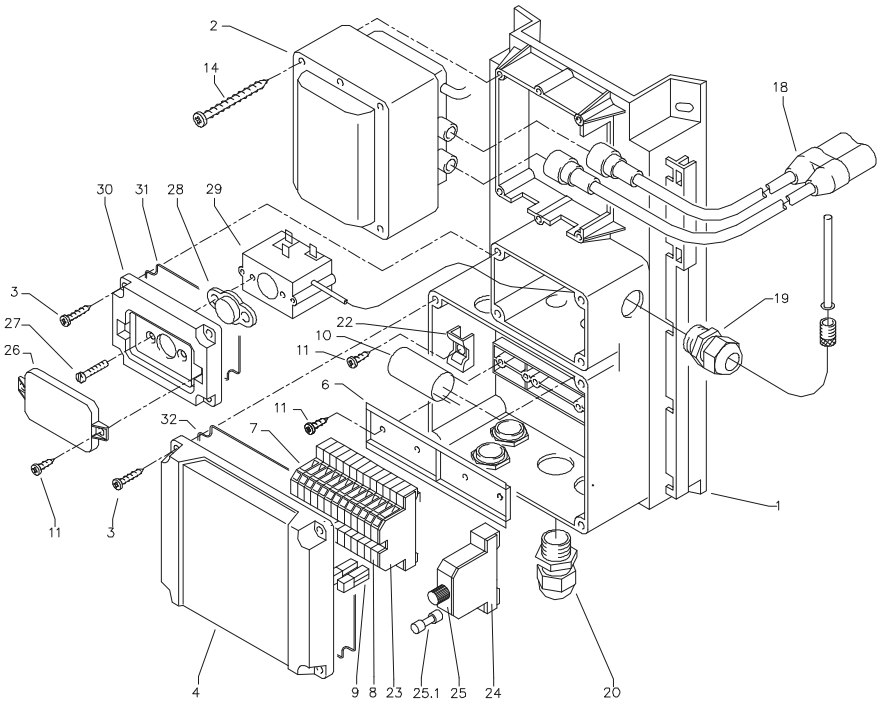
Control and safety block



Safety valve for heating coil
(Adjustment must be approx. 15% above the operating pressure)

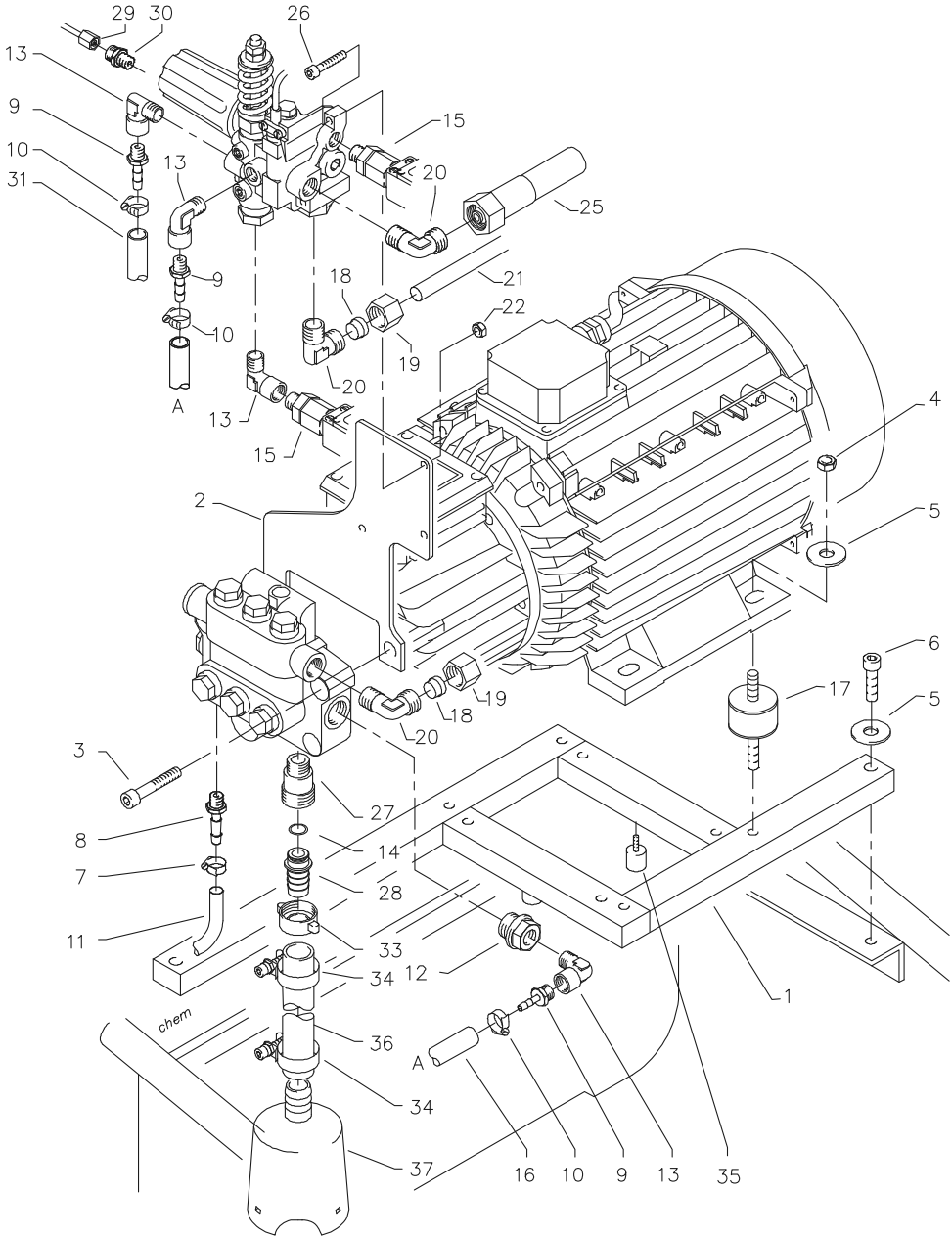
No.	Description	Qty.	Order No.
1	Ventilgehäuse Sicherheitsblock	1	40.590
2	Verschlußschraube R 1/8" IG	1	40.591
3	Dichtstopfen M 8 x 1	3	13.158
4	Dichtstopfen M 10 x 1	1	43.043
5	O-Ring 15 x 2	5	13.150
6	Kolbenführung spezial	1	42.105
7	Stömungskörper	1	40.592
8	O-Ring 11 x 1,44	4	12.256
9	Edelstahlsitz 8,2 mm	2	13.146
9.1	Edelstahlsitz 7,0 mm	1	14.118
10	Sprengring	2	13.147
11	Edelstahlkugel 10,0 mm	3	12.122
12	Edelstahlfeder	2	14.119
13	Verschlußschraube	1	14.113
14	Steuerkolben Sicherheitsventil	1	14.110
15	Parbaks 16 mm	2	13.159
16	Parbaks 8 mm	2	14.123
17	Spannstift	2	14.148
18	Kolbenführung	1	14.109
19	Sechskantmutter M 8 x 1	2	14.144
20	Ventilfeder	2	14.125
21	Federdruckscheibe	2	14.126
22	Nadellager	1	14.146
23	Handrad	1	14.147
24	Steuerkolben	1	14.134
25	Elasic-Stop-Mutter	1	14.152
26	Rückschlagfeder „K“	1	14.120 1
27	Klemmstück	1	40.593
28	Schraube M 4 x 10	2	41.489
29	Magnetschalter	1	40.594
30	Sechkantmutter M 8	2	14.127
31	Eingangsstück R 3/8"	1	13.136
32	Verschlußschraube M 14 x 1	1	40.595

Terminal box and transformer



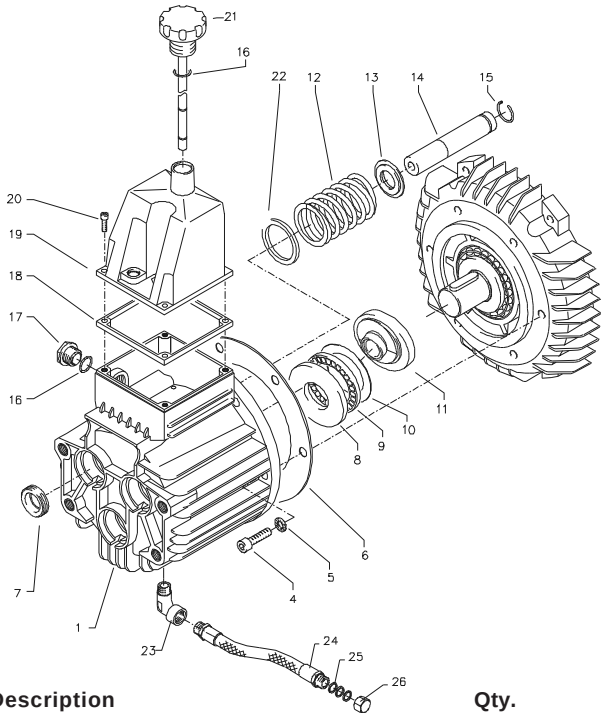
No.	Description	Qty.	Order No.
1	Konsole mit integr. Klemmkasten	1	44.067 1
2	Transformator 230 V / 60 Hz	1	44.074 2
3	Kunststoffschraube 4,0 x 25	8	43.425
4	Deckel für Klemmkasten	1	44.075 2
6	Hutschiene für Verteilerkasten	1	44.125
7	Durchgangsklemme grau	18	44.047
8	Durchgangsklemme grün/gelb	3	44.048
9	Querbrücker 24 A	6	44.047 1
10	Entstörkondensator	1	44.124
11	Blechschraube 3,9 x 9,5	7	12.172
14	Kunststoffschraube 4 x 60	4	43.420
18	Zündkabel mit Stecker	1	44.114
19	PG-Verschraubung PG 16	2	41.419 1
20	PG-Verschraubung PG 11	5	41.419
22	Haltesockel für Entstörglied	1	44.178
23	Abdeckplatte für Durchgangsklemme	1	44.047 2
24	Abdeckplatte für Sicherungsklemme	1	44.166 1
25	Halteklemme für Feinsicherung	1	44.166
25.1	Feinsicherung 3,15 A träge	1	44.166 3
26	Abdeckkappe Überstromauslöser	1	44.154
27	Schraube M 4 x 12	2	41.089 1
28	Dichtung für Übertemperaturauslöser	1	44.157
29	Übertemperaturauslöser	2	44.169
30	Deckel für Übertemperaturauslöser	2	44.182
31	Dichtung für Deckel Übertemperaturauslöser	1	44.182 1
32	Dichtung für Deckel Klemmkasten	1	44.075 3

Screw connections



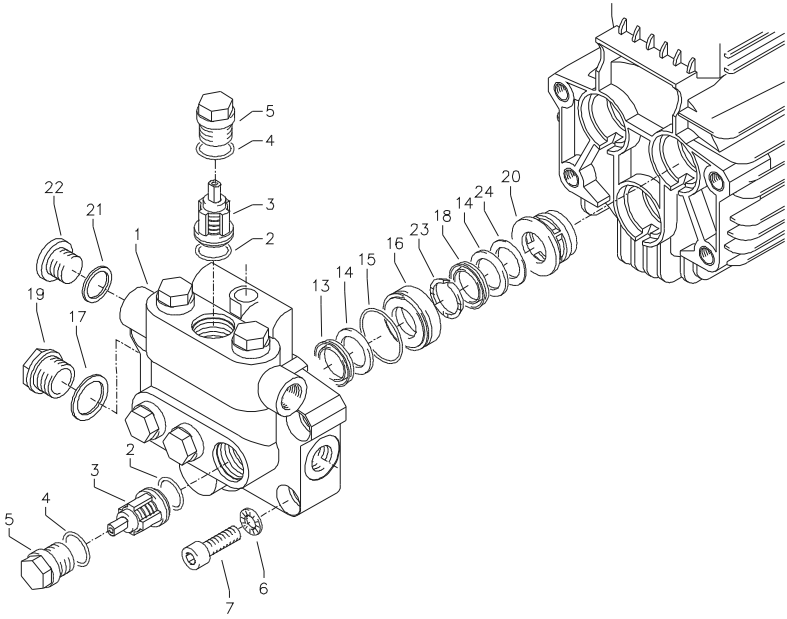
No.	Description	Qty.	Order No.
1	Aggregathalterung	1	44.013
2	Halteblech Sicherheitsblock	1	44.095
3	Innensechskantschraube M 12 x 45	4	40.504
4	Elastic-Stop-Mutter M8	4	41.410
5	Unterlegscheibe 8,4 DIN 9021	7	41.409
6	Innensechskantschraube M 8 x 30	3	41.036 1
7	Schlauchschelle 7 - 10	1	44.054
8	Schlauchtülle 3/8" x 6	1	44.029
9	Schlauchtülle 1/4" x 6	3	44.053
10	Schlauchschelle 10-16	3	41.046 3
11	Waschmittelsaugschlauch	1	44.055
12	Verschlußschraube 1/2" AG mit 1/4" IG	1	44.121
13	Einschraubwinkel R1/4" IG/AG	4	40.121
14	O-Ring 13 x 2,6	1	13.272
15	Druckschalter (schwarz) kpl. mit Kabel 0,59 m	1	44.120
15.1	Druckschalter (rot) kpl. mit Kabel 0,49 m	1	44.120 1
16	By-Pass- Verbindungsschlauch	1	44.097
17	Schwingmetall 30 x 30	4	44.227
18	Klemmhülse 12 mm	2	40.074
19	Ermetomutter 12 mm	2	40.075
20	Einschraubwinkelverschraubung 3/8" x 12	3	44.092
21	Ermetorohr Pumpenausgang	1	44.098
22	Elastic-Stop-Mutter M 6	3	14.152 1
25	Hochdruckschlauch	1	44.093
26	Innensechskantschraube M 6 x 30	2	43.037
27	Sauganschluß 3/8" AG x 3/4" AG	1	41.016
28	Schlauchtülle 9,0 für Sauganschluß	1	44.126 1
29	Druckmessleitung	1	44.102
30	Einschraubverschr. 1/8" x 6 mm	1	40.591 1
31	Bypass Schlauch Sicherheitsventil	1	44.104
33	Schlauchverschraubung 3/4" x 19	1	44.122
34	Schlauchschelle 20 - 32	2	44.054 1
35	Gummidämpfer	2	43.419
36	Ansaugschlauch	1	44.096
37	Saugglocke mit Sieb	1	15.038 5

Pump



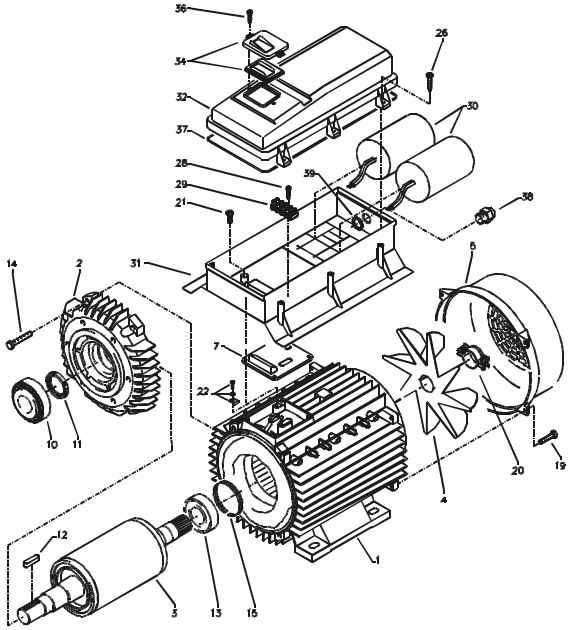
No.	Description	Qty.	Order No.
1	Ölgehäuse	1	40.501
4	Innensechskantschraube M 8 x 25	6	40.053
5	Sicherungsscheibe	6	40.054
6	Flachdichtung	1	40.511
7	Öldichtung 20 x 38 x 7	3	40.044 1
8	Wellenscheibe	1	40.043
9	Axial-Rollenkäfig	1	40.040
10	AS-Scheibe	1	40.041
11	Taumelscheibe 7,0°	1	40.042 1-7,0
12	Plungerfeder	3	40.506
13	Federdruckscheibe	3	40.510
14	Plunger 20 mm (lang)	3	40.505
15	Sprengring	3	40.048
16	O-Ring 14 x 2	2	43.445
17	Verschlußschraube M 18 x 1,5	1	41.011
18	Flachdichtung	1	41.019 3
19	Deckel	1	40.518
20	Innensechskantschraube M 5 x 12	4	41.019 4
21	Ölmeßstab	1	42.520
22	Stützscheibe für Plungerfeder	3	40.513
23	Einschraubwinkel 3/8" x 3/8"	1	44.127
24	Ölablasschlauch	1	44.128 1
25	Kupferring	3	14.149
26	Verschlußkappe	1	44.130

Valve housing



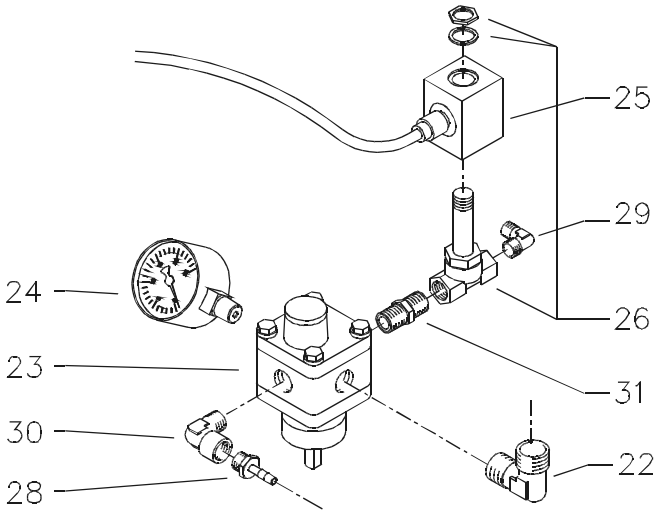
No.	Description	Qty.	Order No.
1	Ventilgehäuse	1	40.502 1
2	O-Ring 18 x 2	6	40.016
3	Einlaß- / Auslaß- Ventil	6	42.024
4	O-Ring 21 x 2	6	42.025
5	Ventilstopfen	6	42.026
6	Sicherungsring	4	40.032
7	Innensechskantschraube M 12 x 45	4	40.504
13	Gewebemanschette	3	40.023
14	Backring 20 mm	6	40.025
15	O-Ring 31,42 x 2,62	3	40.508 1
16	Leckagering 20 x 36 x 13,3	3	40.509
17	Cu-Dichtring 21 x 28 x 1,5	1	42.039
18	Gummimanschette	3	40.512
19	Verschlußschraube R 1/2"	1	42.032
20	Distanzring mit Abstützung	3	40.507
21	Cu-Dichtring 17 x 22 x 1,5	1	40.019
22	Verschlußschraube R 3/8"	1	40.018
23	Druckring	3	40.021
24	Zwischenring	3	40.516
	Valve housing compl.		**40.502 2**
	Repair kit sleeves and parts made of brass consisting of: 3x Pos. 13; 6x Pos. 14; 3x Pos. 15; 3x Pos. 16; 3x Pos. 18; 3x Pos. 20; 3x Pos. 23		**40.065 1**
	Repair kit sleeves consisting of: 3x Pos. 13; 6x Pos. 14; 3x Pos. 15; 3x Pos. 18; 3x Pos. 23		**40.517**
	Repair kit valves consisting of: 6x Pos. 4; 6x Pos. 5; 6x Pos. 6		**41.748 1**

Pump motor



No.	Description	Qty.	Order No.
1	Stator 112 5,5kW 220V / 60Hz	1	40.540
2	A-Lager Flansch	1	40.530
3	Rotor 112 (400V / 50Hz)	1	40.531
4	Lüfterrad für BG 112	1	40.532
5	Lüfterhaube BG 112	1	40.533
7	Flachdichtung	1	43.030
10	Kegelrollenlager 31306	1	40.103
11	Öldichtung 35 x 47 x 7	1	40.080
12	Paßfeder 8 x 7 x 32	1	40.104
13	Kugellager 6206 - 2Z	1	40.538
14	Innensechskantschraube M 6 x 30	4	43.037
15	Toleranzhülse	1	40.544 1
19	Schraube M 4 x 12	4	41.489
20	Schelle für Lüfterrad 112	2	40.535
21	Schraube M 4 x 12	4	41.489
22	Erdungsschraube kpl.	1	43.038
26	Kunststoffschraube 5,0 x 25	6	41.414
28	Kuststoffschraube 3,5 x 20	2	43.415
29	Lüsterklemme 5-pol.	1	43.326 1
30	Kondensator 60 µF	2	41.148
31	Schaltkasten Unterteil	1	42.523
32	Schaltkasten Deckel	1	42.524
34	Klemmrahmen mit Schalterabdichtung	1	44.193
36	Blechschraube 3,5 x 16	2	44.161
37	Dichtung für Schaltkastendeckel	1	42.525
38	PG 16-Verschraubung	1	41.419 1
39	Gegenmutter für PG16-Verschraubung	1	44.119

Fuel pump

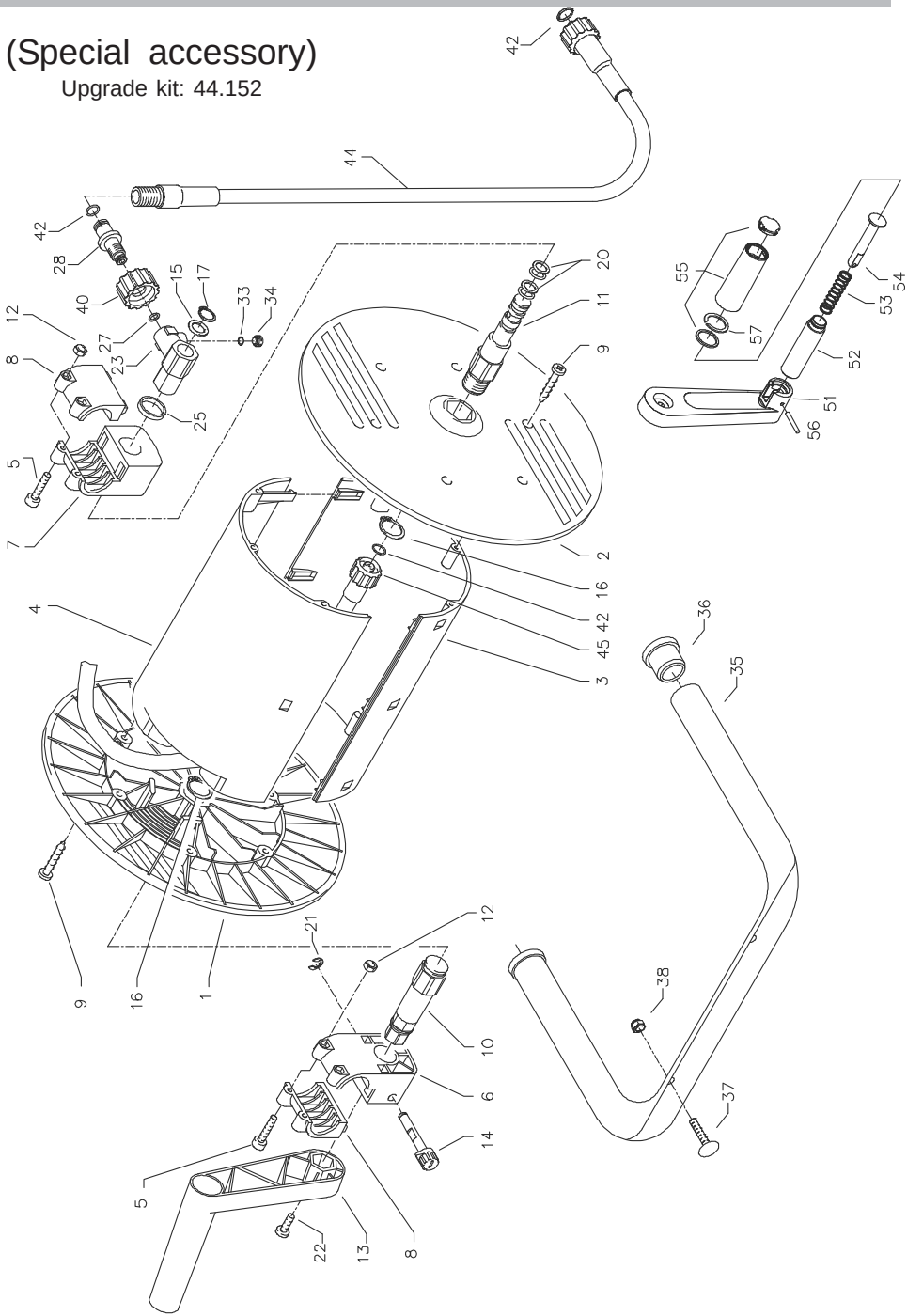


No.	Description	Qty.	Order No.
22	Einschraubwinkel R1/4" AG x 10L	2	40.121 1
23	Brennstoffpumpe mit Magnetventil	1	44.073
24	Brennstoffmanometer 0-15 bar R1/8"	1	44.082
25	Magnet für Magnetventil	1	44.251 1
26	Magnetventil	1	44.251
28	Schlauchtülle 1/4" x 6	1	44.053
29	Winkeleinschraubverschraubung 1/8" x 6	1	44.110 1
30	Winkeleinschraubverschraubung 1/4“ AG x 1/4“ IG	1	40.121
31	Doppelnippel 1/4“ x 1/4“	1	44.251 2
	Fuel pump compl. Pos. 22-26, 28-31		**44.073 1**

Hose drum

(Special accessory)

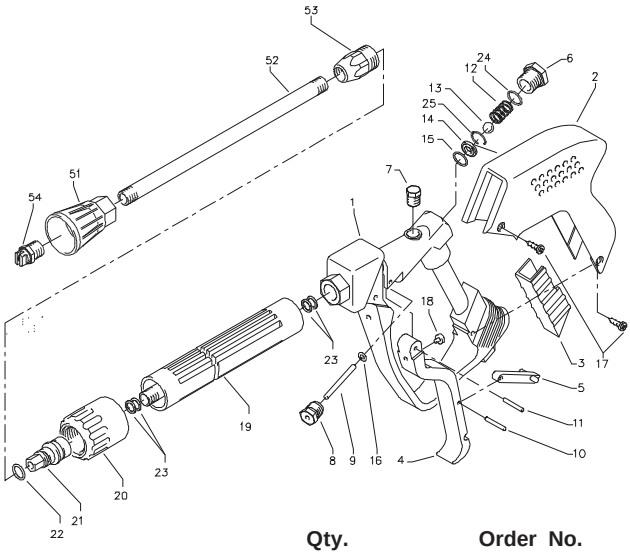
Upgrade kit: 44.152



Spare parts list KRÄNZLE therm
Hose drum

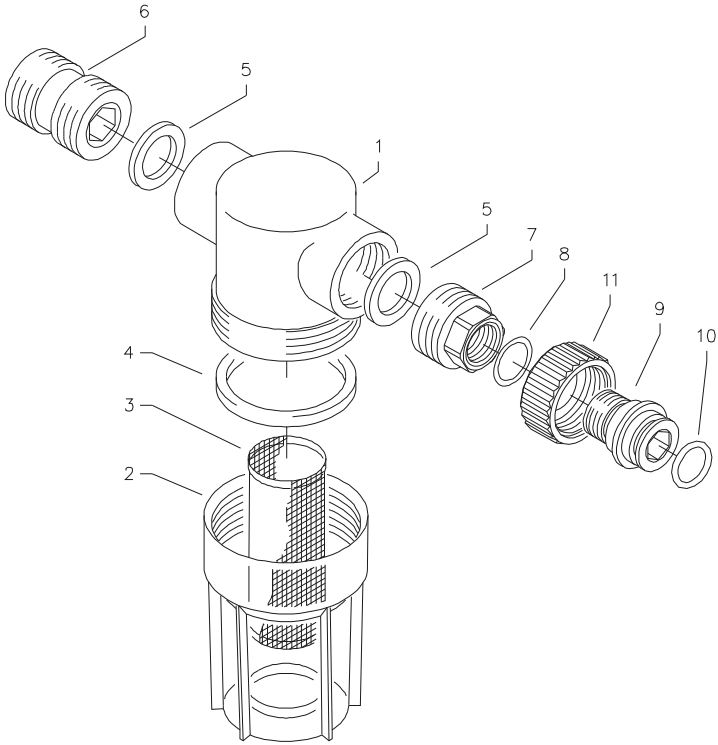
No.	Description	Qty.	Order No.
1	Seitenschale Schlauchführung	1	40.302
2	Seitenschale Wasserführung	1	40.301
3	Trommel Unterteil	1	40.304
4	Trommel Oberteil	1	40.303
5	Innensechskantschraube M 4 x 25	4	40.313
6	Lagerklotz mit Bremse	1	40.306
7	Lagerklotz links	1	40.305
8	Klemmstück	2	40.307
9	Kunststoffschraube 5,0 x 20	12	43.018
10	Antriebswelle	1	40.310
11	Welle Wasserführung	1	40.311
12	Elastic-Stop-Mutter M 4	4	40.111
13	Handkurbel klappbar	1	40.309 9
14	Verriegelungsbolzen	1	40.312
15	Scheibe MS 16 x 24 x 2	1	40.181
16	Wellensicherungsring 22 mm	2	40.117
17	Wellensicherungsring 16 mm	1	40.182
20	Parbaks 16 mm	2	13.159
21	Sicherungsscheibe 6 DIN6799	1	40.315
22	Schraube M 5 x 10	1	43.021
23	Drehgelenk	1	40.167
25	Distanzring	1	40.316
27	O-Ring 6,86 x 1,78	1	40.585
28	Anschlußstück	1	40.308
33	O-Ring 6 x 1,5	1	13.386
34	Stopfen M 10 x 1	1	13.385

No.	Description	Qty.	Order No.
35	Haltebügel	1	44.143
36	Gummistopfen	2	40.208 1
37	Schloßschraube M 8 x 40	2	44.159
38	Elastic-Stop-Mutter M 8	2	41.410
40	Überwurfmutter	1	13.276 2
42	O-Ring 9,3 x 2,4	4	13.273
44	Verbindungsschlauch NW 8 1 m	1	44.160
45	Hochdruckschlauch NW 8 20 m	1	41.083 3
51	Kurbelarm	1	40.309 1
52	Hülse	1	40.309 2
53	Druckfeder	1	40.309 3
54	Bolzen	1	40.309 4
55	Griff mit Kappe und Gleitscheibe	1	40.309 5
56	Spannstift 4 x 28	1	40.309 6
57	Flachsprengring SW18	1	40.309 8
	Hose drum compl. without hose, without bracket		41.259
	Bracket compl. consisting of: Pos. 35 - 38		44.143 1
	Crank compl. consisting of: Pos. 51 - 57		40.309 9



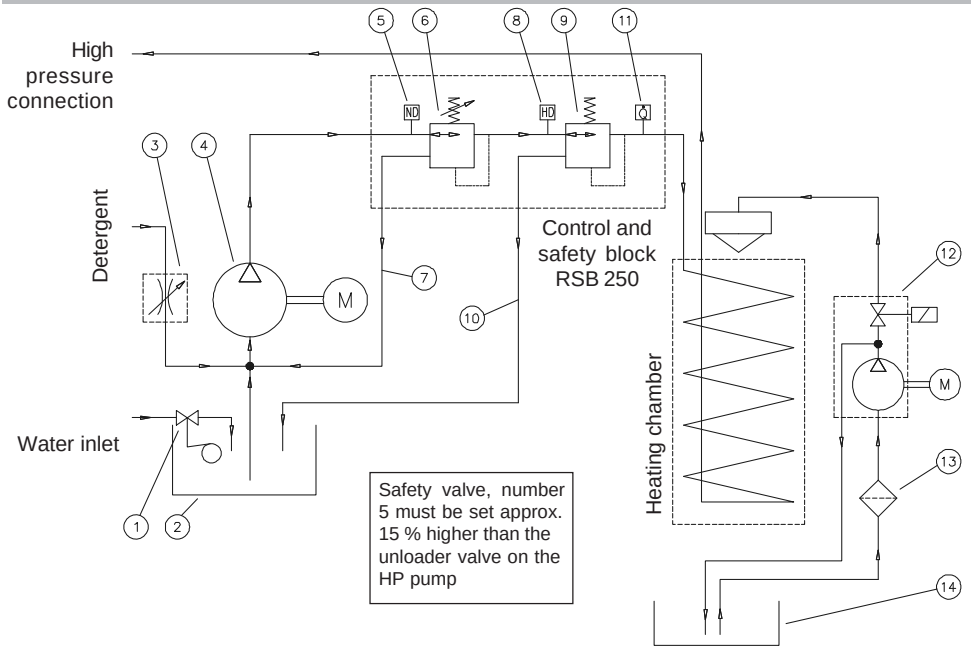
No.	Description	Qty.	Order No.
1	Ventilkörper mit Handgriff	1	12.294
2	Schutzhülse	1	12.295
3	Abdeckschutz	1	12.296
4	Betätigungshebel	1	12.298
5	Sicherungshebel	1	12.149
6	Abschlußschraube M 16 x1	1	12.247
7	Stopfen	1	12.287
8	Gewindeführungshülse R 1/4" AG	1	12.250
9	Aufsteuerbolzen	1	12.284
10	Stift	1	12.148
11	Lagernadel	1	12.253
12	Edelstahlfeder	1	12.246
13	Edelstahlkugel	1	12.245
14	Edelstahlsitz	1	13.146
15	O-Ring 11 x 1,44	1	12.256
16	O-Ring 3,3 x 2,4	1	12.136
17	Blechschraube 3,9 x 8	4	12.297
18	Druckstück	1	12.252
19	Rohr kunststoffumspritzt bds. R 1/4" AG	1	15.004 5
20	Überwurfmutter ST 30 M22 x 1,5 IG	1	13.276 1
21	Außen-Sechskant-Nippel R 1/4" IG	1	13.277 1
22	O-Ring 9,3 x 2,4	1	13.273
23	Aluminium-Dichtring	4	13.275
24	O-Ring 15 x 1,5	1	12.129 1
25	Sicherungsring	1	12.258
51	Düsenschutz	1	26.002
52	Rohr 500 mm; bds. R1/4"	1	12.385 1
53	ST 30 Nippel M 22 x 1,5 / R1/4" m. ISK	1	13.370
54	Lance with flat jet nozzle 25045 (by therm 890)	1	D25045
54.1	Lance with flat jet nozzle 2507 (by therm 1160)	1	D2507
	Starlet-Gunj compl. with extension Pos. 1-24		**12.320 2**
	Rep.-kit "Starlet II" consisting of: 1x Position: 13, 9, 10, 15, 14		**12.299**

Water intake filter



No.	Description	Qty.	Order No.
1	Filtergrundkörper	1	13.301
2	Filterbecher	1	13.302
3	Siebkörper	1	13.304
4	Gummidichtung	1	13.303
5	Gummidichtung 3/4"	2	41.047 1
6	Eingangsteil beids. 3/4" AG	1	13.305
7	Anschlußteil	1	13.306
8	O-Ring 14 x 2	1	43.445
9	Tülle	1	13.307
10	O-Ring 13 x 2,6	1	13.272
11	Überwurfmutter	1	41.047
	Filter complete Pos. 1 - 11		**13.300 3**

Pipeline plan



1 Float valve, water inlet
2 Water tank
3 Control valve, detergent
4 High pressure pump with integrated unloader valve
5 Safety valve for heating coil
6 Excess pressure line, safety valve
7 Fuel pump with solenoid valve
8 Fuel filter
9 Fuel tank

Warranty

This warranty covers material and/or workmanship related defects only and does not extend to ordinary wear.

Machine must be operated according to enclosed operating instructions which are part of present warranty conditions.

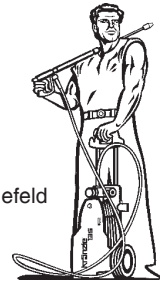
All products sold directly to private customers are warrantied for a period of 24 months, whereas the warranty period for industrial purchases is limited to 12 months.

In case of any warranty claims, please have your HP cleaner together with accessories and your purchase document ready and contact your nearest dealer or authorized service point which can also be looked up in the internet at www.kraenzle.com .

Warranty is void in case of attempts to modify any of the safety devices or in the event of exceeding temperature or rpm limits - this also applies to undervoltage, low water and/or polluted water. Gauge, nozzle, valves, sealing gaskets, high pressure hose and spray equipment are considered wear parts and do not fall under this warranty.

High-pressure-cleaners
Hochdruckreiniger
Nettoyeurs À Haute Pression

I. Kränzle GmbH
Elpke 97 . 33605 Bielefeld



EC declaration of conformity

We hereby declare, that the high-pressure models:	**Kränzle therm 2175**
(techn. documentation available from):	**Manfred Bauer, Fa. Josef Kränzle** **Rudolf-Diesel-Str. 20, 89257 Illertissen**
comply with the following guidelines and specifications and their amendments for high-pressure cleaners:	**Machine guideline 89/392/EEC** **Low voltage guideline 73/23 EEC** **Specification for electromagnetic compatibility 89/336 EEC** **Outdoor noise directive 2000/14/EC,** Art. 13, High-pressure water jet machines Appendix 3, part B, chapter 27
Sound power level measured: guaranteed:	**89 dB (A)** **91 dB (A)**
Applied specifications and standards:	**EN 60 335-2-79 / A1:2001** **EN 55 014-1 / A2:2002** **EN 55 014-2 / A1:2001** **EN 61 000-3-2 / A14:2000** **EN 61 000-3-3 / A1:2001**

Bielefeld, den 08.09.05

Droitsch
(Managing Director)

Inspection sheet

Customer:_____

Mixing unit:

Number of slots: 6
Bore diam.: 25 mm

All lines connected ☐

Hose clamps tight ☐

Screws all installed and tightened ☐

Ignition cable plugged in ☐

Visual check carried out ☐

Brake function checked ☐

Leak test:

Water tank filled and checked ☐

Water inlet checked for tightness ☐

Float valve function checked ☐

Machine checked for tightness under pressure ☐

Electrical check:

Earth line checked ☐

Current intake

Operating pressure:

Switch-off pressure:

Steam phase checked ☐

Chemical valve checked ☐

Start/Stop automatic and
re-run delay checked ☐

Fuel shortage switch checked: ☐

Thermostat function checked ☐

Burner function checked: ☐

Water temperature reached: | 70 | 72 | 74 | 76 | 78 | 80 | 82 | 84 | 86 | 88 | 90 | °C

Fuel pressure: | 8 | 8,5 | 9 | 9,5 | 10 | 10,5 | 11 | 11,5 | 12 | bar

Measured smoke spot number: | 0 | 1 | 2 | 3 |

Result of flue gas analysis:

Safety equipment sealed with lacquer: ☐

The appliance fulfills all requirements according to this inspection sheet ☐

Name of inspector:_____

Date: _____

Signature: _____

Inspection report for HP cleaners

Inspection report on annually carried out Labour Safety Inspection (UVV) according to the Guidelines for Liquid Spray Equipment. (This inspection sheet serves as proof for the completion of the retest and must be kept carefully!)

Owner: _____ Type: ***therm 2175***____ Built: _____

Address: _____ Serial no.: _____

_____ Rep.-order-no.: _____

Scope of inspection:	ok		repair-ed
	yes	no	
Type plate (on hand)			
Operating manual (on hand)			
Protective covering, -device			
Pressure line (tightness)			
Pressure gauge (function)			
Float valve (tightness)			
Spraying device (marking)			
HP-hose/ connector (damage, marking)			
Safety valve opens at 10% / 20% exceeding of operating pressure			
Pressure reservoir			
Heating oil line (tightness)			
Solenoid valve (function)			
Thermostat (function)			
Flow controller (function)			
Power cable (damage)			
Power plug (damage)			
Protective conductor (connected)			
Emergency Off Switch (function)			
On/Off-switch			
Water quantity safety device (function)			
Used chemicals			
Allowed chemicals			

Inspection data:	determ. value	set value
High-pressure nozzle		
Operating pressure .....bar		
Cutting-off pressure.....bar		
Smoke spot number.....acc. to Bacharach scale		
CO^2-value.....% CO^2		
Efficiency rating.....%		
Conductor resist. not exceeded / value:		
Insulation		
Leakage current:		
Gun locked		

Inspection result (tick):

◯ The appliance was checked by an expert according to the Guidelines for Liquid Spray Equipment, the defects found have been rectified so that the Labour Safety can be confirmed.

◯ The appliance was checked by an expert according to the Guidelines for Liquid Spray Equipment. The Labour Safety cannot be confirmed unless the defects found are rectified by repair or replacement of the faulty parts.

The next retest according to the Guidelines for Liquid Spray Equipment has to be carried out by:

Month: _____ Year: _____

Place, Date: _____

Signature: _____

Inspection report for HP cleaners

Inspection report on annually carried out Labour Safety Inspection (UVV) according to the Guidelines for Liquid Spray Equipment. (This inspection sheet serves as proof for the completion of the retest and must be kept carefully!)

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