

Hot Water-High Pressure Cleaners



them C

11/130

13/180

15/150

Operating manual
*Read and conform to
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**

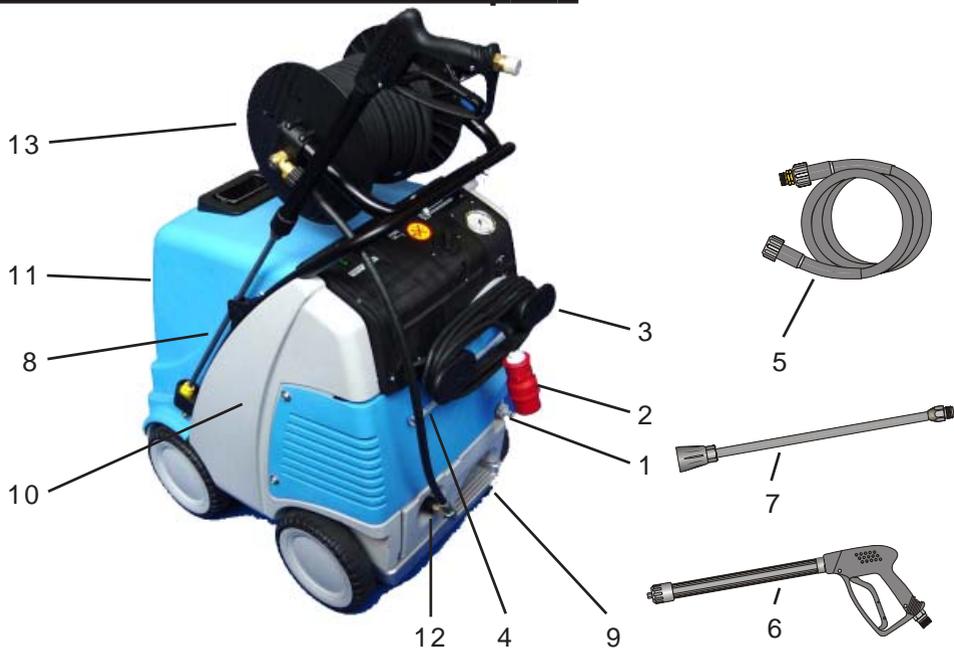
Technical data	therm C 11/130	therm C 13/180	therm C 15/150
Operating pressure	30 - 130 bar	30 - 180 bar	30 - 150 bar
Nozzle size	25045	25045	25055
Permissible overpressure	145 bar	200 bar	170 bar
Water output ^(*) 1	max. 660 l/h	max. 780 l/h	max. 900 l/h
Hot water output	12 - 80 °C	12 - 80 °C	12 - 80 °C
Steam level	max. 140 °C	max. 140 °C	max. 140 °C
Heat.oil nozzle/Heat.oil press.	1.25 Gph/10bar	1.5 Gph/10bar	1.5 Gph/12bar
Heat.oil consumpt. (Heat.oil EL)	4.8 kg/h (=5.7 l/h)	5.7 kg/h (=6.8 l/h)	6.3 kg/h (=7.5 l/h)
Heating capacity	50 kW	60 kW	67 kW
Exhaust gas mass flow	0.032 kg/s	0.035 kg/s	0.041 kg/s
Fuel tank	25 l	25 l	25 l
High pressure hose	10 m	10 m	10 m
with hose drum	15 m	15 m	15 m
Electrical rating:	230V/50Hz / 15A	400V/50Hz / 8.7A	400V/50Hz / 8.7A
Input	P1: 3.4 kW	P1: 4.8 kW	P1: 4.8 kW
Output	P2: 2.3 kW	P2: 4.0 kW	P2: 4.0 kW
Weight	150 kg	150 kg	150 kg
Dimens. in mm without reel	790 x 590 x 980	790 x 590 x 980	790 x 590 x 980
Sound level	74 dB	75 dB	76 dB
Guaranteed sound level L_{WA}	86 dB	86 dB	86 dB
Vibrations at lance	2.4 m/s ²	2.6 m/s ²	2.8 m/s ²
Recoil at lance	approx. 20 N	approx. 22 N	approx. 24 N

Permissible tolerance for figures $\pm 5\%$ in acc. with VDMA uniform sheet 24411

2 ^(*)1 Min. water quantity to be supplied to the high pressure cleaner!

Description

Connections and functional parts



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



- | | | | |
|----|-----------------------------------|----|----------------------------|
| 15 | Master switch (appliance On- Off) | 18 | Manometer |
| 16 | (Burner ON- OFF) ignition | 19 | Thermostat |
| 17 | Brief operating instructions | 20 | Detergent dispensing valve |

Description

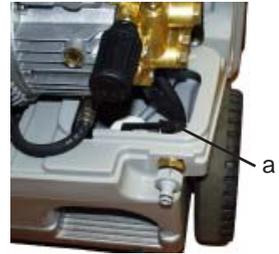
Water system

The water flows into a tank.

A float valve (a) 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.



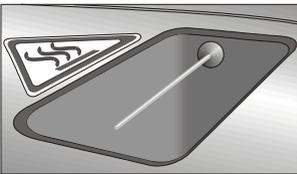
Only open the dosing valve, if the chemistry sieve is placed in a liquid.

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 interlock deactivating button (x) for the overtemperature release on the backside of the switchbox.

The machine has to rest for approx. 15 minutes before it is allowed to press the deactivating 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 this motor protecting switch. For a restart the master switch has to be switched off and then on again. In case of a repeated switching off of the motor by the motor protecting switch the cause of the malfunction has to be removed.



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.

If the spray gun is closed for more than 20 seconds the motor switches off. The motor restarts as soon as the safety trigger is pulled again.

If the gun is closed for more than 20 minutes, the safety switch-off is activated and the high-pressure cleaner switches off completely, i.e. to be able to work with your cleaner it has to be switched OFF and then ON again with the master switch.

After completing work with your Kränzle therm C, 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 with rotary control switch controls the temperature of the spray water.

Use the rotary control switch to adjust the desired water temperature.



Thermostat with rotary control switch

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.

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.

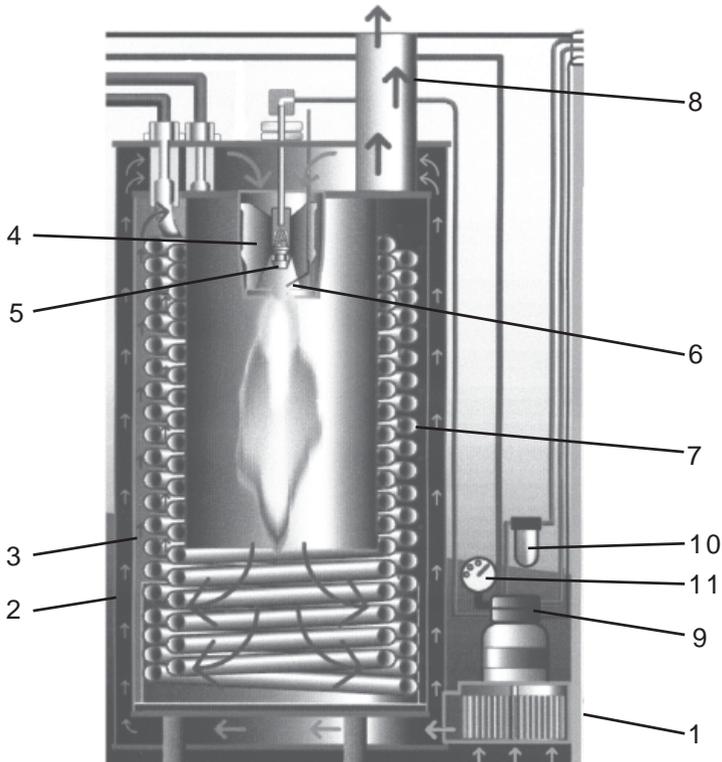
A ventilator (1) draws in the cold, fresh air from the bottom end of the machine and forces it upwards between the outer mantle (2) and the inner mantle (3). In the process, the fresh air is pre-heated and the outer mantle of the heat exchanger is cooled.

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 is shown on the fuel manometer (11).



Safety Information

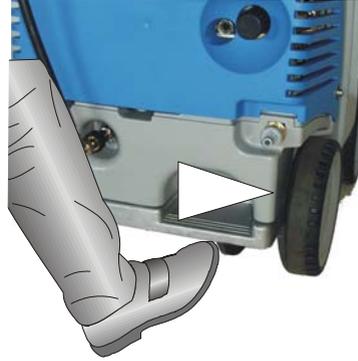
Brake

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

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.

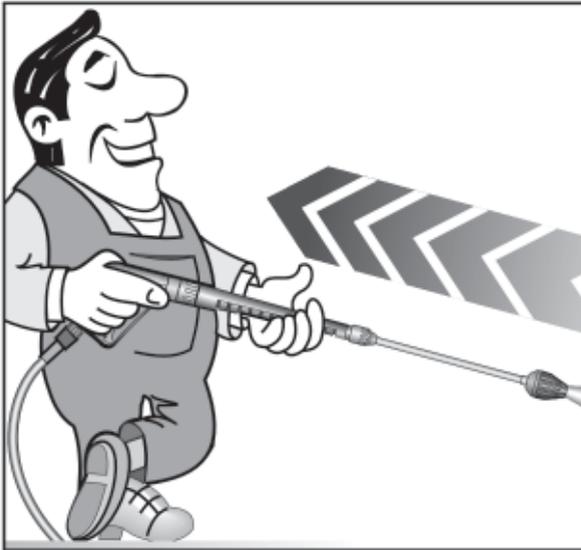
Do not use the cleaner if electrical connections or other safety-relevant parts (e.g. overpressure valve, high pressure hose, spraying equipment etc.) are damaged.

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.

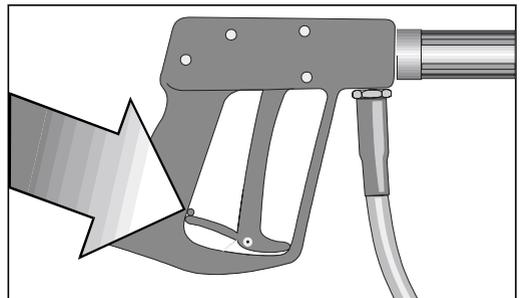
Safety Information

- 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!

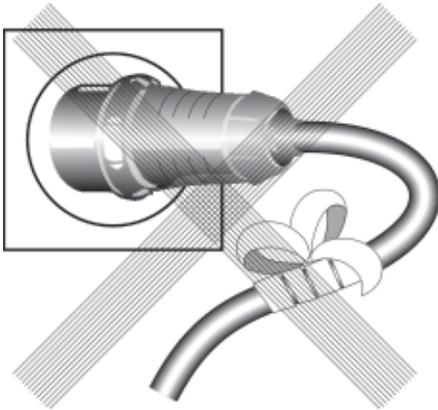
Apply the safety catch on
the spray gun after each use,
in order to prevent unintentional
spraying!



This is prohibited!



Never direct the water jet at people or animals!



Do not damage the power cable or repair it incorrectly!

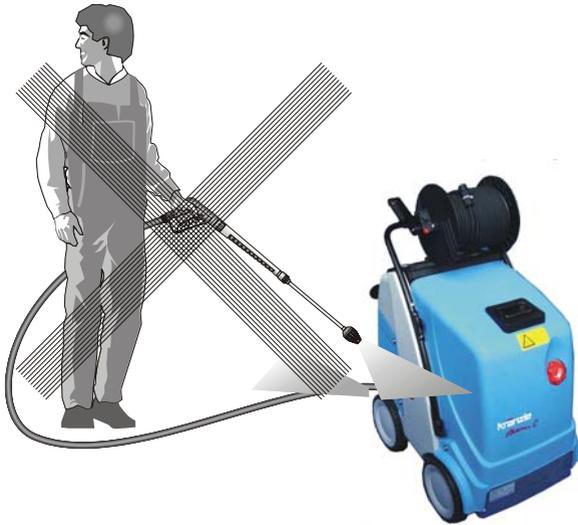


Never pull the high pressure hose if it has formed kinks or "nooses"!
Never pull the hose over sharp edges!

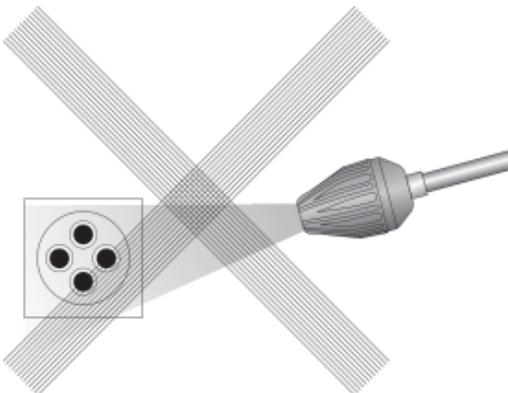
This is prohibited!



Never allow children to use the high pressure cleaner!



Never direct the water jet at the machine itself!

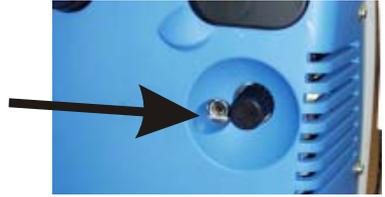


Never direct the water jet at a power socket!

Commissioning

Commissioning

- Secure the machine by applying the brake (see page 8)
- 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).

Electrical connection

Make sure that the master switch is switched off (position „0“).

Plug in the power cable of your high-pressure cleaner.

The voltage given on the specification plate must match the mains voltage. You can find the specification plate on the front right-hand side of the appliance.



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.

Commissioning

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.

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 DIN 1988, 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. 41.016 4) 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 DIN 1988, part 4; e.g. by using a reservoir with a float valve.

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

Commissioning

Switch-on



- Switch off the ignition. Rocker switch (16) to „0“.
- Set the pressure control (4) valve to maximum pressure (see below) and close the detergent valve (20).
- Open the gun and switch the master switch (15) 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.

If the system has to be deaerated (appliance rattles), open and close the spray gun repeatedly.



4



CAUTION

After an extended standstill do not instantly aim the high pressure water jet at the object to be cleaned, as the remaining water inside the high pressure cleaner may be discoloured.

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. 20 seconds, the machine switches off automatically, after 20 minutes the machine moves to safety switch off and you must use the master 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 on the thermostat to min. 40 °C and then 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, adjust the pressure and the water quantity downwards using the handwheel (4) and choose the desired temperature of max. 150 °C with the thermostat. For high pressure cleaners with hose drum applies: The hose must always be fully unwound.

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 (20). The pump now sucks 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 „0“.**
- **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

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 (16) to „0“). Wait with opened gun, until the agent comes out of 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

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

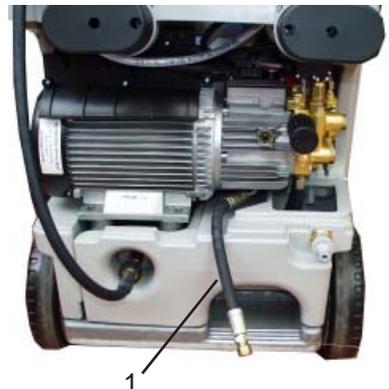
- Check the oil level of the high pressure pump. (see page 13)
If the oil level is too low, add oil until the oil level is between the two markings on the oil measuring rod.
Change the oil (see page 19) if it has a grey or whitish appearance. The oil should be disposed of responsibly.
- Check the filter 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 if the heating coil is calcified (see page 20).
- 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

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.



Care and Maintenance

Oil leakage

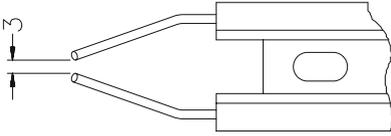


If oil leaks out, go to the nearest customer service (dealer) immediately. (Environmental damages, transmission damages, loss of guarantee.)

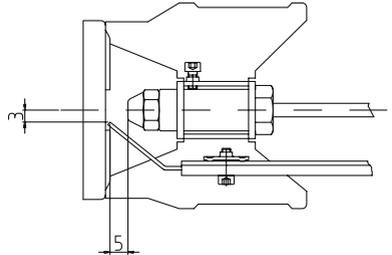
Type of oil: Formula RS of Castrol - Quantity: 1.0 l

Adjusting ignition electrodes

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



Check distance in mm



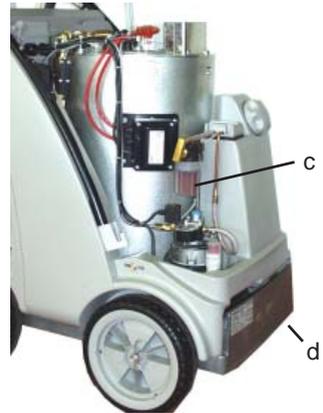
Fuel System

Your fuel may contain particles of dirt, or impurities or water may get into the tank during refuelling.

As a safeguard for the fuel pump the appliance is fitted with a fuel filter (c). Check regularly if the filter is soiled and clean it if necessary.

Check the tank for impurities on a regular basis.

Empty the fuel tank using the drainage screw (d) at the bottom of the tank. Clean the tank and the fuel lines carefully. Screw in the drainage screw.



Detergent and dirty fuel must be disposed of responsibly.

Care and Maintenance

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.

Care and Maintenance

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.

Description of function - Troubleshooting



IMPORTANT!!!

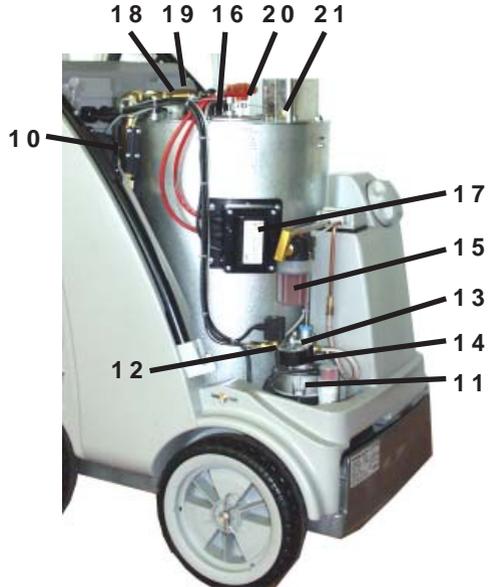
Always remove the plug before working on the machine!



- 1 Master switch
- 2 Ignition "ON/OFF"
- 3 Brief operating instructions
- 4 Thermostat



- 5 Hand wheel for pressure adjustment
 - 6 High pressure pump
 - 7 Pressure switch black (start solenoid valve)
 - 8 Pressure switch red (start pump)
 - 9 Safety valve
- 22



- 10 Flow controller
- 11 Motor for ventilator and fuel pump
- 12 Solenoid valve (Fuel)
- 13 Fuel pump
- 14 Fuel manometer
- 15 Fuel filter
- 16 Photo cell Flame monitoring
- 17 Ignition transformer
- 18 Thermosensor water
- 19 Excess temperature release
- 20 Ignition electrodes
- 21 Thermosensor exhaust gas

Description of function - Troubleshooting

Cold water mode

1. Connect to water supply and determine whether the water tank fills up completely and the float valve stops.
2. Ignition (2) to OFF.
3. Main switch (1) 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 (8). The 40-Second-Stop system is activated, i.e. after closing the gun, the pump motor is turned off after 40 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 (2) for the burner to ON. Then, turn the rotary switch on the thermostat, (4) located on the front, to the desired temperature (at least 40 °C) in order to activate the burner, i.e., that fuel is injected.

The manometer (14) on the fuel pump shows approx. 10 bars. If this reading is not displayed, check whether

1. there is heating oil in the tank
2. the motor fuse (11) in the switch box (below the operation panel) has tripped.
3. the fuel sieve (15) or the fuel sieve in the pump (13) is dirty.
4. the fuel pump does not operate smoothly or is blocked.
5. the ventilator jams.

The thermostat grants permission to open the solenoid valve; after opening the gun, the burner starts. The burner starts and heats up the water to the set temperature. The burner switches off as soon as the desired temperature has been reached.

To avoid substantial fluctuations especially with high temperatures the high pressure cleaner is equipped with an after-heating feature, i.e. 13 seconds after the burner was switched off by the thermostat, the burner is restarted and stopped again after 11 seconds.

If the temperature drops again, the burner switches on automatically thus guaranteeing the required constant temperature.

Description of function - Troubleshooting

The thermostat (4) is controlled via a thermo-sensor (18) mounted at the outlet of the heating coil.

In the switchbox (below the operating panel), a fuse (F1) is installed on the board protecting the motor (11) of the fuel pump and the ventilator. If the motor is overloaded the fuse trips. This may happen if the fuse pump is blocked or sluggish - the same applies if the ventilator is blocked or sluggish or in case of an electrical malfunction.

Another fuse (F2) on the board trips, if the ignition transformer (17) is faulty.

There is a thermosensor (21) in the waste gas tube, which controls an excess temperature relay with trigger function (19), i.e. when the exhaust gas temperature in the chimney increases above 230 °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 (19) 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.

The appliance is equipped with a visual flame monitoring device. A photo cell (16) is installed above the burning chamber, switching off the fuel supply if the flame is extinguished.

To avoid an overheating of the burning chamber a flow indicator (10) is installed in the high pressure system between the high pressure pump (6) and the burning chamber enabling a fuel supply only if water streams through the heating coil at the same time.

Control board (p. 28-29)

The control board is equipped with two LEDs for trouble shooting.

L1: - permanently illuminated, if the overcurrent release has tripped.

- blinking, if the fuel flow valve detects only a low quantity of fuel in the tank or if it is defective.

L2: - illuminated, if the burner has been released but the flame is not burning. If the flame starts burning within 2 seconds, the LED goes out.

If the LED does not go out the combustion has to be checked. If the LED is not illuminated at all, the flame sensor has to be checked.

Nevertheless the cleaner can be used as a cold water high pressure cleaner even if the burner is switched off.

Troubleshooting



IMPORTANT!!!

Always remove the plug before working on the machine!

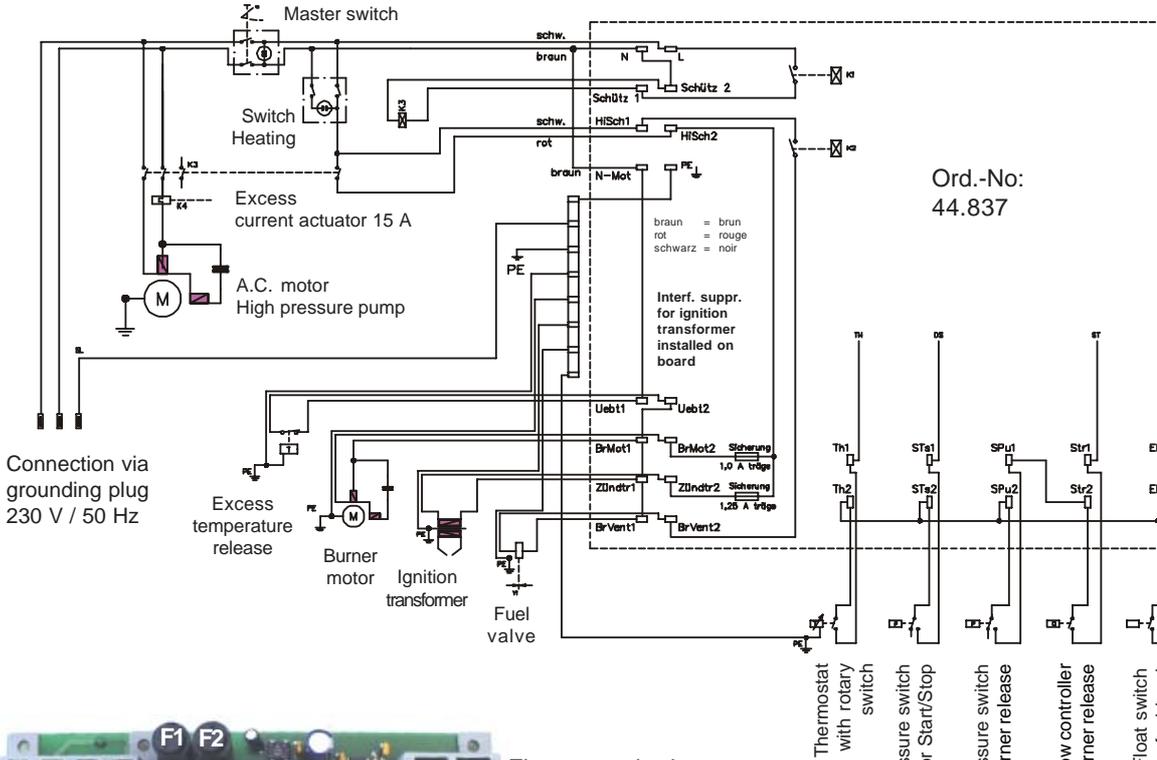
<i>Malfunction</i>	<i>Cause of malfunction / Trouble shooting</i>
<p>Water supply</p> <p>Water tank runs over.</p> <p>Water tank does not fill completely.</p> <p>Pump does not suck.</p> <p>Test: check water and chemical system for tightness.</p>	<p>Float valve is dirty. Float valve is defect.</p> <p>Float valve is defect Water filter soiled. Check water inlet quantity.</p> <p>Valves stick or are dirty. Suction hose leaks. Chemistry valve is open or leaks. Check hose clips (connections). High-pressure nozzle is clogged.</p> <p>Connect water inlet directly to the pump (2-4 bar pre-pressure). Disconnect suction lines below the pump.</p>
<p>High-pressure pump</p> <p>Pump makes lots of noise.</p> <p>Operating pressure is not reached.</p> <p>Water drops from the pump.</p> <p>Oil drops from the transmission.</p> <p>Pressure is too low</p>	<p>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.</p> <p>Replace sleeves in the pump. Replace O-rings.</p> <p>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?).</p> <p>Worn high pressure nozzle</p> <p>Stainless steel seat, ball, O-ring in unloader is dirty or defect.</p> <p>Manometer is defect</p>

Troubleshooting

<i>Malfunction</i>	<i>Cause of malfunction / Trouble shooting</i>
Machine does not switch off Test: Jumper (red) pressure switch	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.
Appliance does not start or stops during operation	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. Fuel pump/blower does not operate. - Pump makes lots of noise - Fuel operating pressure has not been reached Coupling between burner motor and fuel pump is broken	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. Blower/fuel pump motor is defect. Check electrical equipment. Check fuse in terminal box. Coupling between burner motor and fuel pump is defect. Water in fuel tank. Dirt or rust in the fuel pump. Clean tank. Replace fuel pump.
Burning Smoke during operation Smoke after switching off	Fuel is dirty. Nozzle or nozzle stock leaks. Water in tank.

Troubleshooting

<i>Malfunction</i>	<i>Cause of malfunction / Trouble shooting</i>
<p>Solenoid valve on the fuel pump does not open Test: Pressure switch (black)</p> <p>Bridge in terminal box between terminal 3 +4</p> <p>Test: Connect solenoid valve 230 V externally</p> <p>Oil pressure on the fuel pump is too low too high</p>	<p>Check pressure switch (black). Solenoid valve is defect or dirty.</p> <p>Clean filter, clean supply line, clean fuel pump. Setting is wrong. Clean fuel nozzle, or replace it.</p>
<p>Ignition does not function</p>	<p>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.</p>
<p>Ventilator does not operate</p>	<p>Blower-/fuel pump motor is defect. Check electrical equipment.</p> <p>Check fuse in terminal box. Coupling between burner motor and fuel pump is defect.</p>
<p>Spray gun - High-pressure hose</p> <p>Gun drips</p> <p>High pressure hose drips</p> <p>Nozzle is clogged</p>	<p>Check for leakages.</p> <p>Replace seals.</p> <p>Replace O-ring under screwed connection.</p> <p>Manometer indicates pressure, but no water comes out of HP-hose – clean nozzle.</p>
<p>Sucking detergent</p> <p>Detergent is not sucked</p>	<p>Pump sucks air. Check hose clips.</p> <p>Test: Connect water line to the pump. Water inlet: 2 - 4 bar pre-pressure. No water must come from the detergent hose.</p>



Connection via grounding plug 230 V / 50 Hz

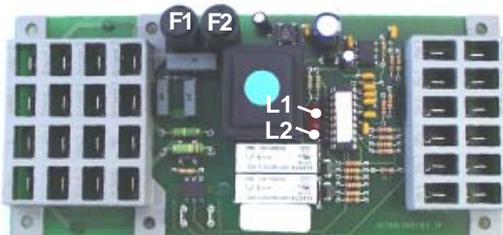
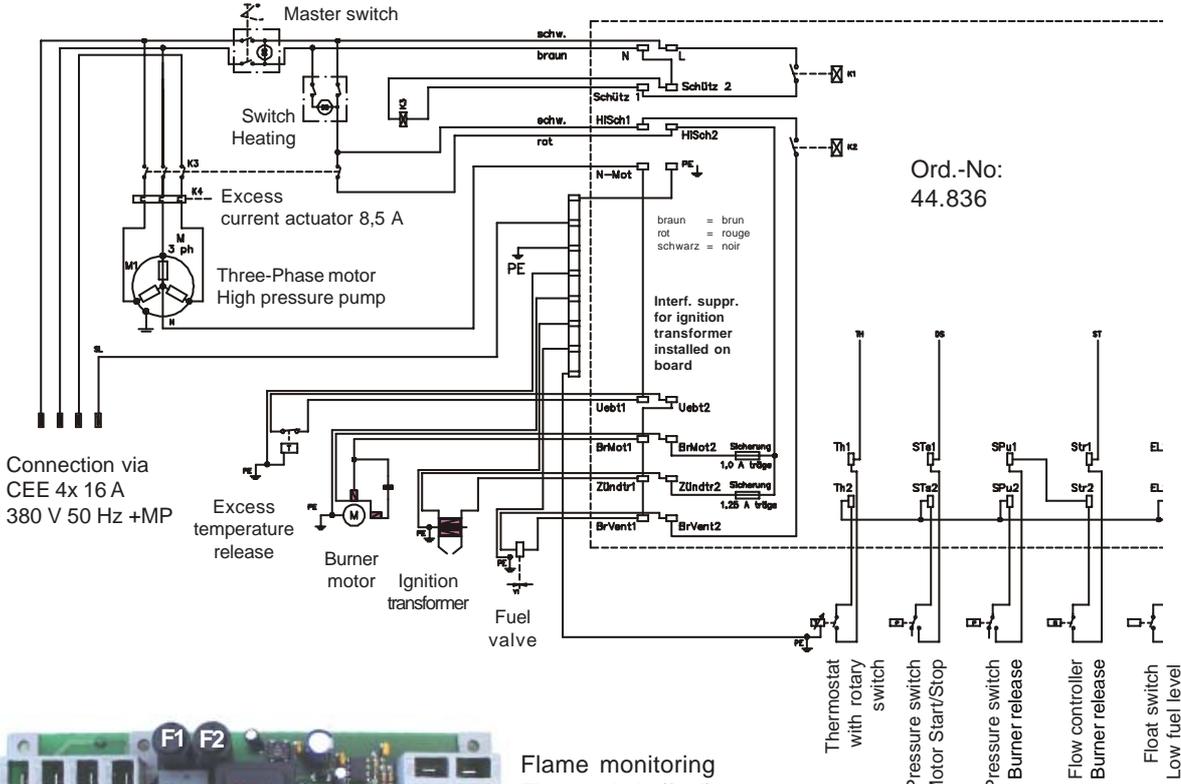


- Flame monitoring
- Float switch (fuel)
- Flow controller
- Pressure switch Burner release
- Pressure switch Motor Start/Stop
- Thermostat with rotary switch

Ord.-No:
44.837

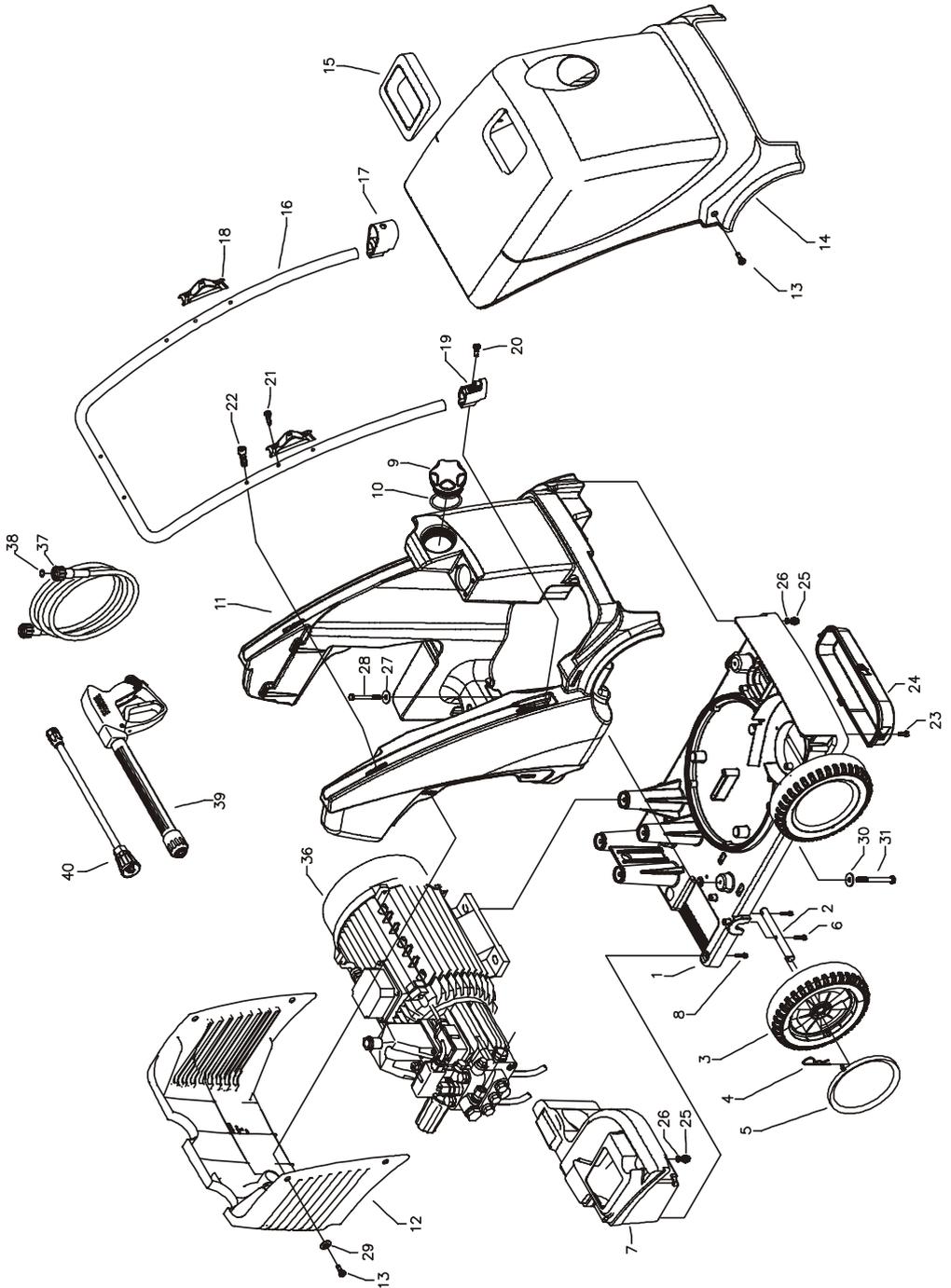
- Thermostat with rotary switch
- Pressure switch Motor Start/Stop
- Pressure switch Burner release
- Flow controller Burner release
- Float switch Low fuel level

Photo cell
Flame monitoring



- Flame monitoring
- Float switch (fuel)
- Flow controller
- Pressure switch Burner release
- Pressure switch Motor Start/Stop
- Thermostat with rotary switch

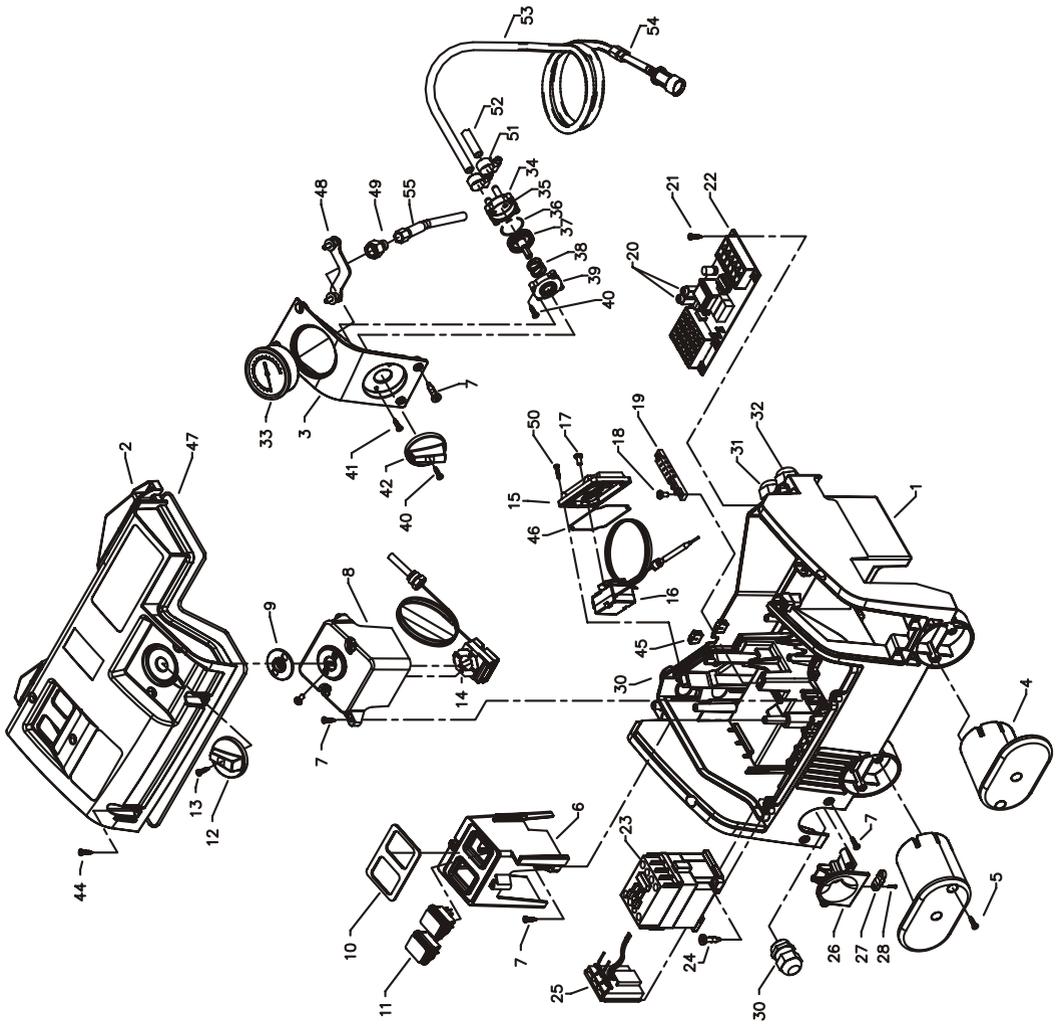
Complete Assembly



Spare parts list **KRÄNZLE therm C**
Complete Assembly

No.	Description	Qty.	Order No.	No.	Description	Qty.	Order No.
1	Fahrgestell	1	44.800	21	Blechschraube 3,5x16 DIN7981	8	44.161
2	Achse	4	44.820	22	Schraube M6x35 DIN6912	2	46.024
3	Rad d250	4	46.010	23	Schraube M5x10 DIN7985	4	43.021
4	Federstecker	4	40.115 1	24	Deckel Zuluft	1	44.801
5	Radkappe	4	46.011	25	Ablaßschraube	2	44.004 1
6	Schraube M6x35 DIN6912	8	46.024	26	Dichtung für Ablaßschraube	2	41.047 1
7	Wasserkasten	1	44.805	27	Scheibe 8,4 DIN9021	4	41.409
8	Schraube M6x16 DIN912	3	44.831	28	Schraube M8x80 DIN931	4	44.832
9	Tankdeckel mit Pos. 10	1	44.833	29	Scheibe Haubenbefestigung	6	44.849
10	O-Ring 70 x 5	1	44.020	30	Scheibe DIN9021 8,4	4	41.409
11	Brennstofftank	1	44.806	31	Schraube M 8 x 80	4	44.832
12	Haube hinten	1	44.812	36.1	Motor-Pumpe für therm C 11/130	1	44.883
13	Schraube M8x12 DIN7985	6	44.827	36.2	Motor-Pumpe für therm C 13/180	1	44.884
14	Haube vorn	1	44.813	36.3	Motor-Pumpe für therm C 15/150	1	44.885
15	Kaminblende	1	44.825	37	Hochdruckschlauch NW 8 10 m	1	44.878
16	Schubbügel	1	44.834	38	O-Ring 9,3 x 2,4 Viton	2	13.273 1
17	Köchertopf	1	46.503	39	Gun with extension - Starlett II	1	41 053 1
18	Lanzenhalter	2	42.610	40.1	Lance with flat jet nozzle 25045 (for therm C 11/130 + 13/180)	1	12.392-D25045
19	Lanzenständer	1	46.502	40.2	Lance with flat jet nozzle 25055 (for therm C 15/150)	1	12.392-D25055
20	Schraube M6x12	2	43.421				

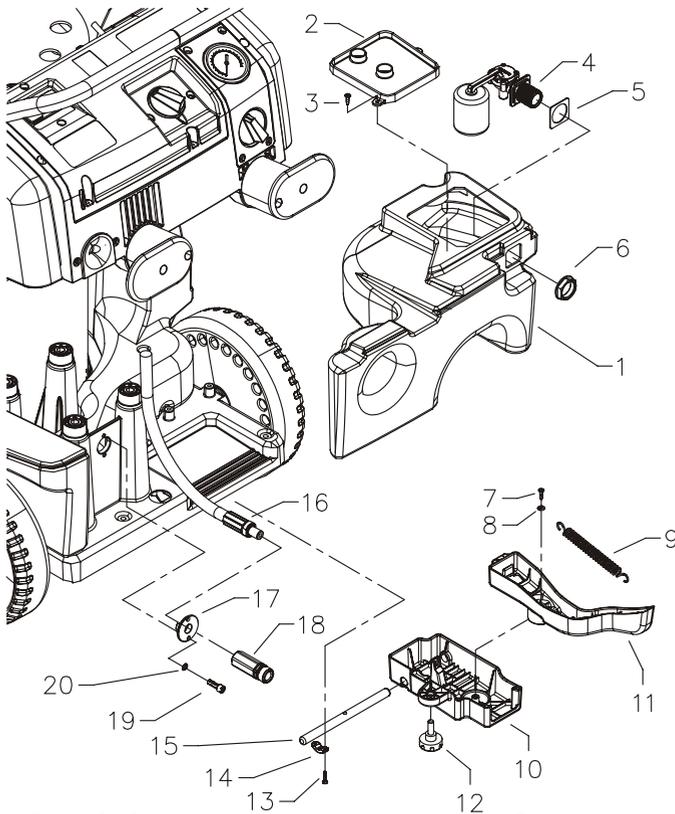
Electronics switchbox



Spare parts list **KRÄNZLE therm C**
Electronics switchbox

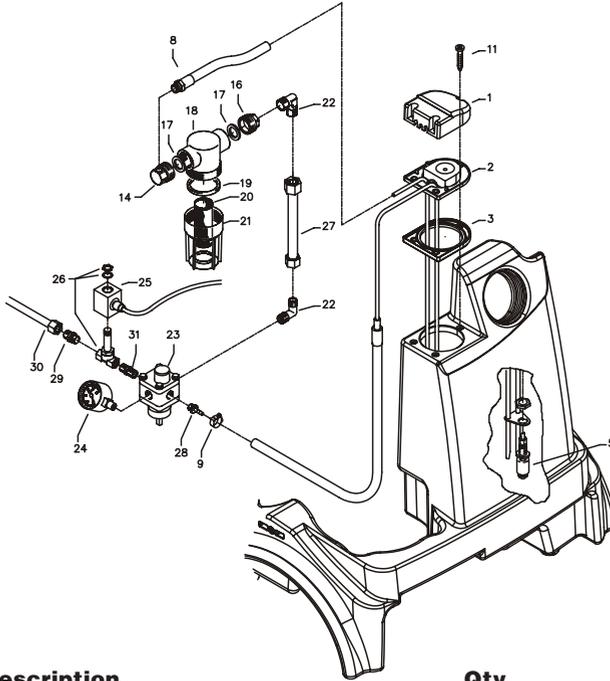
No.	Description	Qty.	Order No.	No.	Description	Qty.	Order No.
1	Elektrokasten	1	44.807	26	Kabeltrompete mit Zugentlastung	1	44.819
2.1	Cover for electr. box therm C 11/130	1	44.808 2	27	Zugentlastungsschelle	1	43.431
2.2	Cover for electr. box therm C 13/180	1	44.808 3	28	Schraube 3,5 x 14	2	44.525
2.3	Cover for electr. box therm C 15/150 mit Dichtung	1	44.808 4	30	PG16-Verschraubung 1 Durchföhrung	2	41.419 1
3	Frontplatte Manometer	1	44.809	31	PG16-Verschraubung 2 Durchföhrungen	3	44.132
4	Kabelaufwicklung	2	44.822	32	PG16-Verschraubung 3 Durchföhrungen	1	44.133
5	Schraube 5 x 25	4	41.414 1	33	Manometer	1	15.039 1
6	Bock für Schalter	1	44.810	34	Gehäuse Waschmittelventil	1	44.145
7	Schraube 5x14	10	43.426	35	O-Ring 5 x 1,5 (Viton)	1	44.150
8	Bock für Thermostat	1	44.811	36	O-Ring 28,24 x 2,62	1	44.149
9	Dichtung für Thermostat	1	44.818	37	Regulierkolben Chemieventil	1	44.147
10	Dichtung für Schalter	1	44.817	38	Edelstahlfeder 1,8 x 15 x 15	1	44.148
11	Schalter	2	44.835	39	Deckel für Chemieventil	1	44.146
12	Drehgriff Thermostat	1	44.153	40	Blechschrabe 3,5 x 16	3	44.161
13	Gewindeschneidschraube M 2,5 x 8	1	44.168	41	Blechschrabe 3,5 x 19	2	44.162
14	Thermostat drehbar 0-150°C	1	44.167	42	Drehgriff Chemieventil mit Blendkappe	1	44.151
15	Deckel für Übertemperaturauslöser	1	44.182	44	Schraube 5,0 x 20 mit angepr. Scheibe	10	43.018
16	Übertemperaturauslöser	2	44.169	45	Durchföhrungstölle für Kapillarrohr	2	44.823
17	Schraube M 4 x 12	2	41.489	46	Dichtung für Deckel Übertemp.	1	44.182 1
18	Schraube 4,0 x 16	8	43.417	47	Dichtung Elektrokasten	1	44.838
19	Erdungsklemme	1	44.839	48	Klemmbügel für Manometer	1	44.049
20	Feinsicherung M 1,25 A	2	44.676	49	Anschlußmuffe Manometer	1	44.136
22	Steuerplatine 400 V / 50/60 Hz	1	44.836	50	Kunststoffschrabe 4,0 x 25	8	43.425
22.1	Steuerplatine 230 V / 50/60 Hz	1	44.837	51	Schlauchklemme 9 - 9	2	44.054
23	Schütz 400 V / 50/60 Hz	1	46.005 1	52	Schlauch für Waschmittelansaugung	1	44.055
23.1	Schütz 230 V / 50/60 Hz	1	46.005	53	Schlauch mit Filter und Rückschlagv.	1	44.056 1
24	Schraube 4,0 x 25 mit angepr. Scheibe	2	43.425	54	Rückschlagventil für Waschmittelan.	1	44.240 1
25	Überstromauslöser 8,5A 3-pol.	1	46.040	55	Druckmeßleitung	1	44.102
25.1	Überstromauslöser 15A 1-pol.	1	46.041		Chemical valve compl. Pos. 34-42		44.052

Water supply and brake



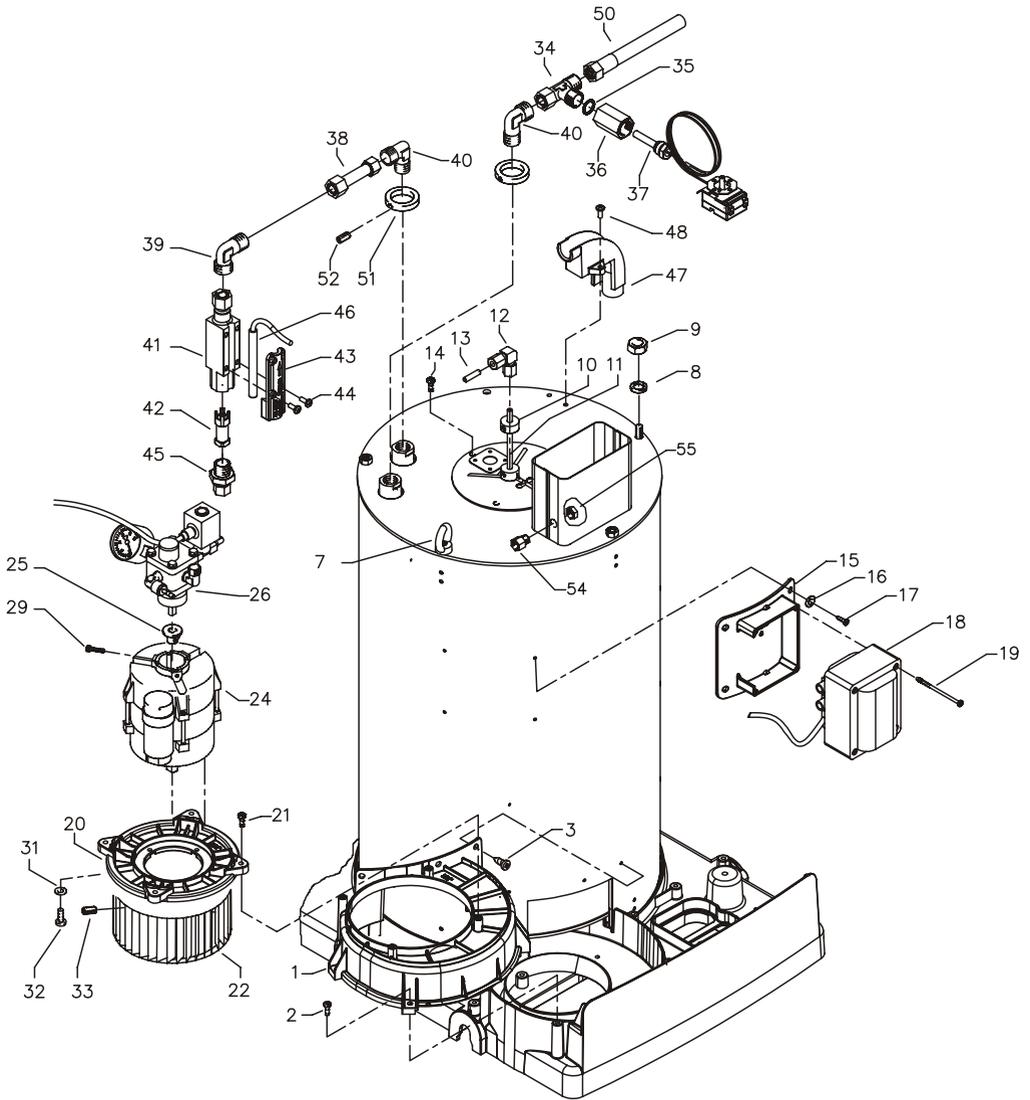
No.	Description	Qty.	Order No.
1	Wassertank	1	44.805
2	Deckel Wassertank	1	44.828
3	Schraube 3,9 x 13	2	41.078
4	Schwimmerventil	1	46.250
5	Moosgummidichtung	1	46.261
6	Mutter R3/4"	1	46.258
7	Kunststoffschraube 5x14	1	43.426
8	Scheibe 5,3 DIN9021	1	50.152
9	Zugfeder	1	46.020
10	Deckel Bremse	1	46.016
11	Hebel Bremse	1	44.804
12	Sternschraube M8	1	50.168
13	Innensechskantschraube M4x10	4	46.002
14	Schelle	2	43.431
15	Bolzen für Bremse	1	46.018
16	HD-Schlauch Wasserausgang	1	44.840
17	Haltescheibe	1	44.841
18	Ausgangsteil R1/4" x ST30	1	44.842
19	Schraube DIN912 M5x12	2	41.019 4
20	Zahnscheibe 5,1	2	43.483
	Brake compl. Pos. 6-14		44.880

Fuel supply



No.	Description	Qty.	Order No.
1	Deckel Brennstoffversorgung	1	44.011
2	Flansch mit Brennstoffleitungen	1	44.842
3	Gummidichtung	1	44.012
5	Schwimmerschalter	1	44.014
8	Rücklaufschlauch	1	44.843
9	Schlauchschele 8 - 12	1	44.054 5
11	Schraube 5,0 x 25	3	41.414 1
14	Ausgangsstück Brennstofffilter R1/8"	1	44.214 2
15	Abgangsstück	1	44.844
16	Anschlußteil Brennstofffilter R1/4"	1	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 (Pos. 16, 26, 31)	1	44.852
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	Schlauchfülle 1/4" x 6	1	44.053
29	Einschraubverschraubung 1/8" x 6	1	40.591 1
30	Brennstoffzuleitung	1	44.845
31	Doppelnippel 1/4" x 1/4"	1	44.251 2
	Fuel filter compl. Pos. 15 - 21		44.881
	Fuel pump compl. Pos. 22-26, 28, 29 ,31		44.852 1

Combustion chamber

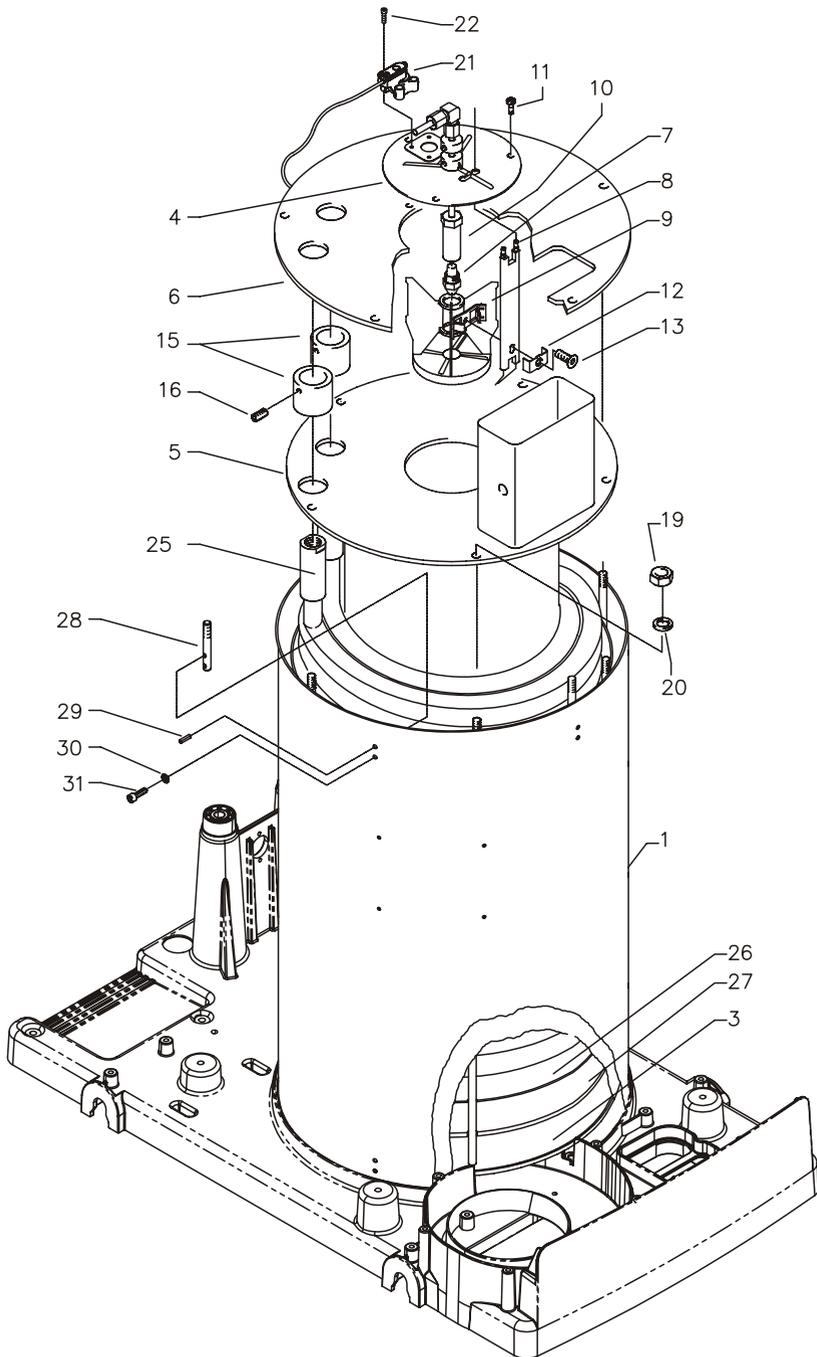


Kränzle therm C

Spare parts list KRÄNZLE therm Combustion chamber

No.	Description	Qty.	Order No.
1	Gebälsegehäuse	1	44.802
2	Schraube M 5 x 10	5	43.021
3	Schraube 3,9 x 13	3	41.078
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	44.846
14	Edelstahlschraube M 6 x 10	3	44.177
15	Halterung Zündtrafo	1	44.821
16	Scheibe DIN9021 4,3	4	43.472
17	Schraube 3,9 x 13	4	41.078
18	Zündtrafo	1	44.851
19	Schraube 4,0 x 60	4	43.420
20	Deckel Gebläsegehäuse	1	44.803
21	Schraube 5,0 x 20	4	43.018
22	Lüfterrad	1	44.847
24	Lüftermotor 230 V / 50 Hz, DR rechts	1	44.850
25	Steckkupplung	1	44.085
26	Brennstoffpumpe kpl.		44.852 1
29	Zyl.schraube mit ISK M 5 x 12 DIN 912	1	40.134
31	Unterlegscheibe 4,3	4	44.059
32	Senkschraube M 4 x 8	4	44.091
33	Gewindestift M 6 x 8 DIN 914	1	44.090
34	L-Verschraubung	1	44.869
35	Dichtring	1	14.149
36	Fühleraufnahme	1	44.170
37	Thermostat drehbar 0-150°C	1	44.167
38	Ermtorohr 12x85 mit Muttern und Schneidring	1	44.848
39	Winkelverschraubung 12L x 12L	1	42.630
40	Einschraubwinkelversch. 3/8" x 12L	2	44.092
41	Grundkörper Strömungswächter	1	12.601
42	Strömungskörper	1	12.602
43	Abdeckung	1	12.603
44	Schraube M 4 x 10	4	43.470
45	Eingangsteil 3/8" x 12 mit Mutter und Schneidring	1	12.604
46	Magnetschalter	1	40.594
47	Schlauchführung	1	44.830
48	Schraube M 5 x 14	2	40.536
50	Hochdruckschlauch Wasserausgang	1	44.840
51	Abschlußring	2	44.086
52	Gewindestift M 6 x 8 DIN 914	2	44.090
54	Fühler Muffe	1	44.171
55	Mutter	1	44.172
	Blower-fuel pump unit Pos. 20 - 33		44.882
	Flow controller compl. Pos. 41 - 45		12.600 1

Combustion chamber

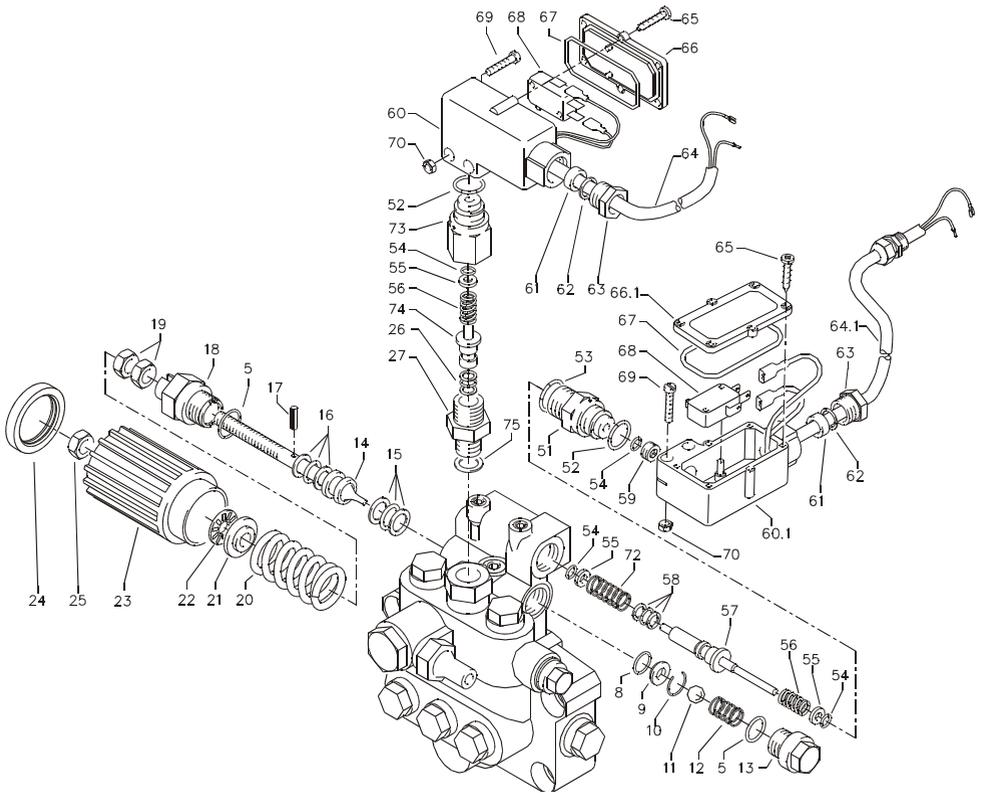


Kränzle therm C

Spare parts list KRÄNZLE therm Combustion chamber

No.	Description	Qty.	Order No.
1	Außenmantel mit Zugbolzen	1	44.860
3	Innenmantel mit Bodenplatte	1	44.064 1
4	Deckel Düsenstock	1	44.079
5	Innendeckel mit Kamin und Flammrohr	1	44.861
6	Außendeckel	1	44.862
7	Brennstoffdüse 60° B 1,35 gph (C11/130)	1	44.077 2
7.1	Brennstoffdüse 60° B 1,5 gph (C13/180; C15/150)	1	44.077
8	Blockelektrode	1	44.854
9.1	Düsenstock Ø 22 mm, 4 Schlitze (C11/130)	1	44.076
9.2	Düsenstock Ø 25 mm, 6 Schl. (C13/180; C15/150)	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
28	Zugbolzen	10	44.863
29	Spannstift 4 x 14	10	44.829
30	Zahnscheibe 4,3	10	43.471
31	Schraube DIN912 M 4 x 10	10	46.002

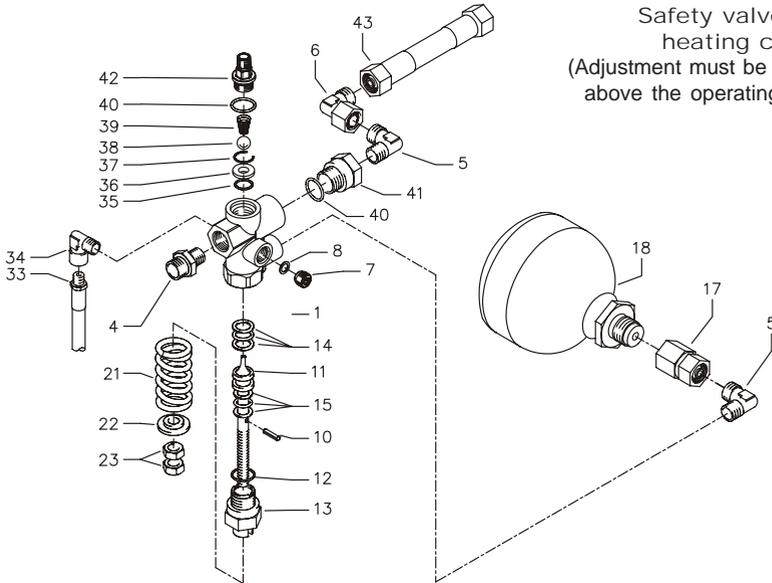
Unloader and pressure switch



Kränzle therm C

No.	Description	Qty.	Order No.
5	O-Ring 16 x 2	2	13.150
8	O-Ring 11 x 1,44	1	12.256
9	Edelstahlsitz	1	14.118
10	Sicherungsring	1	13.147
11	Edelstahlkugel 8,5 mm	1	13.148
12	Edelstahlfeder	1	14.119
13	Verschlußschraube	1	14.113
14	Steuerkolben	1	14.134
15	Parbaks 16 mm	1	13.159
16	Parbaks 8 mm	1	14.123
17	Spannstift	1	14.148
18	Kolbenführung spezial	1	42.105
19	Mutter M 8 x 1	2	14.144
20	Ventilfeder schwarz	1	14.125
21	Federdruckscheibe	1	14.126
22	Nadellager	1	14.146
23	Handrad AM-Pumpe	1	40.457
24	Kappe Handrad AM-Pumpe	1	40.458
25	Elastic-Stop-Mutter	1	14.152
26	Parbaks 7 mm	1	15.013
27	Ausgangsteil R1/4" AG	1	15.011
51	Führungsteil Steuerstößel	1	15.009 1
52	O-Ring 12,3 x 2,4	2	15.017
53	O-Ring 14 x 2	1	43.445
54	O-Ring 3,3 x 2,4	4	12.136
55	Stützscheibe	3	15.015 1
56	Edelstahlfeder	2	15.016
57	Steuerstößel lang	1	15.010 2
58	Parbaks	1	15.013
59	Stopfen M10x1 (durchgebohrt)	1	13.385 1
60	Gehäuse Elektroschalter (schwarz)	1	15.007
60.1	Gehäuse Elektroschalter (rot)	1	15.007 1
61	Gummimanschette PG 9	2	15.020
62	Scheibe PG 9	2	15.021
63	Verschraubung PG 9	2	15.022
64	Kabel 3 x 1,0 mm ² 0,59 m	1	44.131
64.1	Kabel 3 x 1,0 mm ² 0,49 m	1	44.131 1
65	Blechschaube 2,9 x 19	12	15.024
66	Deckel Elektroschalter (schwarz)	1	15.008
66.1	Deckel Elektroschalter (rot)	1	15.008 1
67	O-Ring 44 x 2,5	2	15.023
68	Mikroschalter	2	15.018
69	Zylinderschraube M 4 x 20	4	15.025
70	Sechskant-Mutter M 4	4	15.026
73	Grundteil Elektroschalter	1	15.009
74	Steuerkolben	1	15.010
	Guide piston compl.		14.132 2
	Pos. 5, 14-22, 25		
	Pressure switch (black) compl. with cable 0,59 m		44.120
	Pos. 26, 27,52, 54, 55, 56, 60 - 74		
	Pressure switch (red) compl. with cable 0,49 m		44.120 1
	Pos. 51 - 74		
	Output piece for red switch, compl.		15.009 3
	Pos. 51 -59		
	Output piece for black switch, comp.		15.011 1
	Pos. 26, 27, 52, 54-56, 73, 74		

Safety valve for heating coil



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

No.	Description	Qty.	Order No.
1	Ventilkörper	1	14.145
4	Ermetoverschraubung R 3/8" x 12 mm	1	40.076
5	Ermetowinkel R 1/4" x 12 mm	1	44.864
6	Ermetowinkel 12 mm x 12 mm Mutter	1	44.865
7	Stopfen R1/4"	1	13.387
8	O-Ring	1	13.275
10	Spanstift	1	14.148
11	Steuerkolben	1	14.133
12	O-Ring	1	13.150
13	Kolbenführung	1	14.130
14	Parbaks 16 mm	1	13.159
15	Parbaks 8 mm	1	14.123
17	Anschlußmuffe für Hydrospeicher	1	44.140 1
18	Hydrospeicher	1	44.140
21	Ventilfeder	1	14.125
22	Federdruckscheibe	1	14.126
23	Sechskantmutter M 8 x 1	2	14.144
33	Rücklaufschlauch S200	1	44.867
34	Einschraubwinkel	1	40.121
35	O-Ring 11 x 1,44	1	12.256
36	Edelstahlsitz	1	14.118
37	Sprengring	1	13.147
38	Edelstahlkugel 8,5 mm	1	13.148
39	Edelstahlfeder	1	14.119
40	O-Ring 15 x 2	2	13.150
41	Eingangsstück R3/8" x R1/4"	1	13.136 1
42	Anschlußteil Druckmessleitung	1	44.868
43	Verbindungsschlauch 12mm S200-Strömungw.	1	44.866

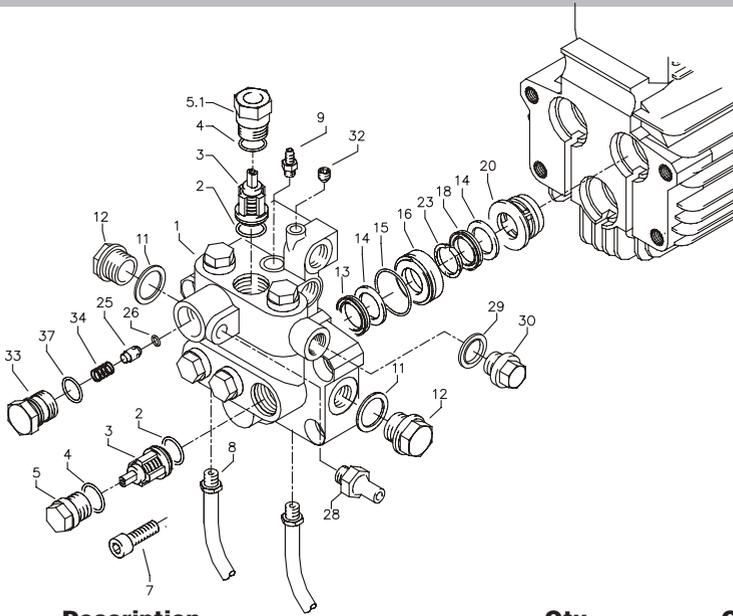
Guide piston compl. Pos. 10-15; 21-23

14.110 1

Safety valve compl. Pos. 1-15; 21-42

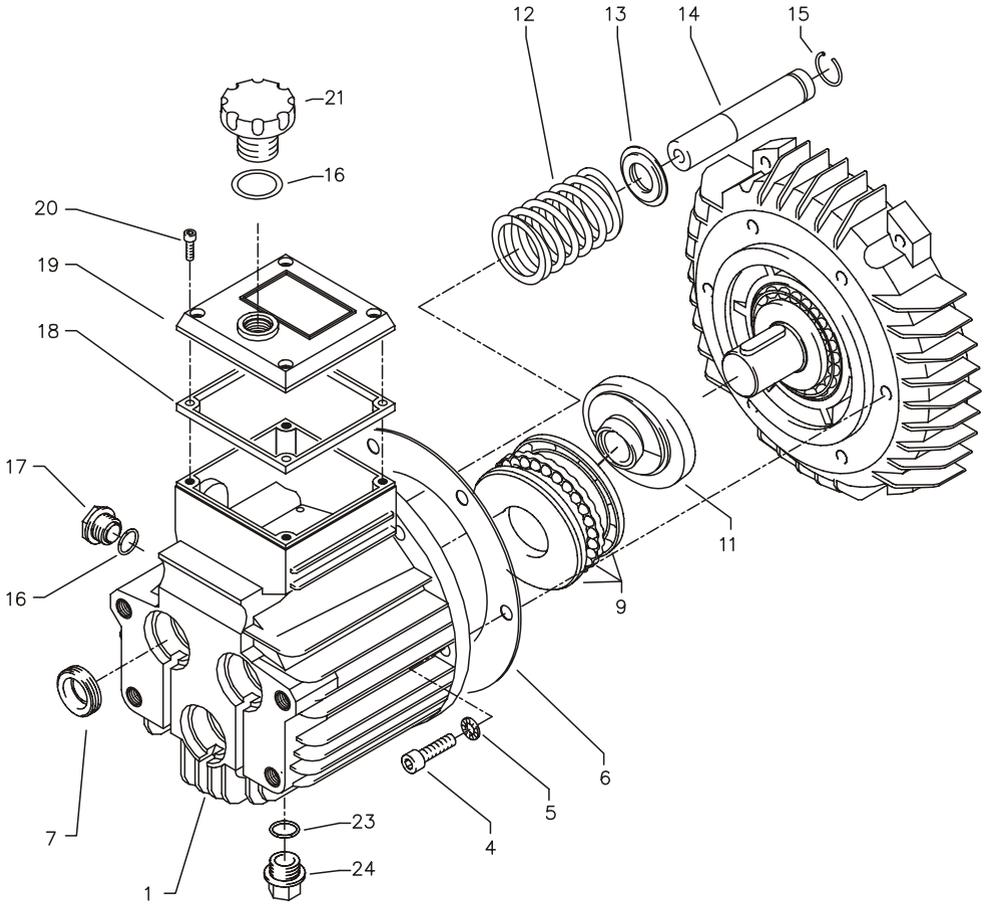
44.888

Valve housing



No.	Description	Qty.	Order No.
1	Ventilgehäuse AM-Pumpe	1	40.451
2	O-Ring 15 x 2	6	41.716
3	Ventile (grün) für APG-Pumpe	6	41.715 1
4	O-Ring 16 x 2	6	13.150
5	Ventilstopfen	5	41.714
5.1	Ventilstopfen mit R1/4" IG	1	42.026 1
7	Innensechskantschraube M10 x 35	4	42.509 1
8	Ansaugschlauch mit Nippel R1/4"	2	44.096 4
9	Saugzapfen Schlauchanschluß	1	13.236
11	Dichtring	1	40.019
12	Stopfen 3/8"	1	40.018
13	Manschette 18 x 26 x 4/2	3	41.013
14	Backring 18 mm	6	41.014
15	O-Ring	3	40.026
16	Leckagering 18 mm	3	41.066
18	Gewebemanschette 18 x 26 x 5,5/3	3	41.013 1
20	Zwischenring 18 mm	3	41.015 2
23	Druckring	3	41.018
25	Rückschlagkörper	!	14.122
26	O-Ring 8 x 2	1	43.070
28	Ausgangsteil Pumpe R1/4" x 12	1	44.215
29	Kupferring	1	42.104
30	Dichtstopfen R1/4" mit Bund	1	42.103
32	Dichtstopfen M 8 x 1	2	13.158
33	Ausgangsteil	1	42.166
34	Rückschlagfeder	1	14.120
37	O-Ring 18 x 2	1	43.446
	Valve housing compl.		44.320
	Rep.-kit valves for APG-pump		41.748 1
	6x Pos. 2; 6x Pos. 3; 6x Pos. 4		
	Repair kit sleeves 18 mm		41.049 1
	3x Pos. 13; 6x Pos. 14; 3x Pos. 15; 3x Pos. 23; 3x Pos. 18		

Pump

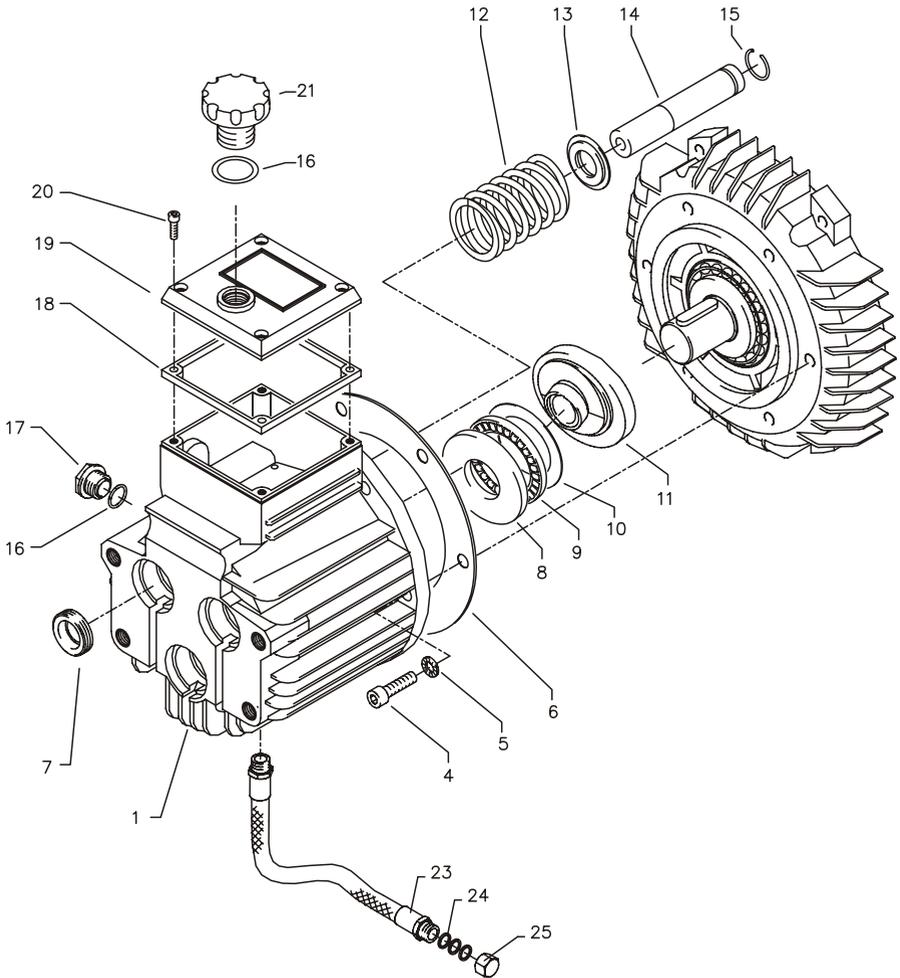


Kränzle therm C 11/130

Spare parts list **KRÄNZLE therm C 11/130** **Pump**

No.	Description	Qty.	Order No.
1	Ölgehäuse mit Öldichtungen	1	40.452
4	Innensechskantschraube M 8 x 25	6	40.053
5	Sicherungsscheibe	6	40.054
6	Flachdichtung	1	40.511
7	Öldichtung 18 x 28 x 7	3	41.031
9	Axial-Rillenkugellager AM	1	40.462
11	Swash plate 9,5° (C 11/130)	1	40.460-9,5
12	Plungerfeder	3	40.453
13	Federdruckscheibe	3	40.454
14	Plunger 18mm (AM-Pumpe)	3	40.455
15	Sprengring	3	41.035
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	41.023 1
20	Innensechskantschraube M 5 x 12	4	41.019 4
21	Ölmeßstab (AM-Pumpe)	1	40.461
23	O-Ring	1	43.445
24	Verschlußstopfen R 3/8"	1	40.051
	Oil housing AM compl.		40.452 1
	Pos. 1, 4-7, 12-17		

Pump

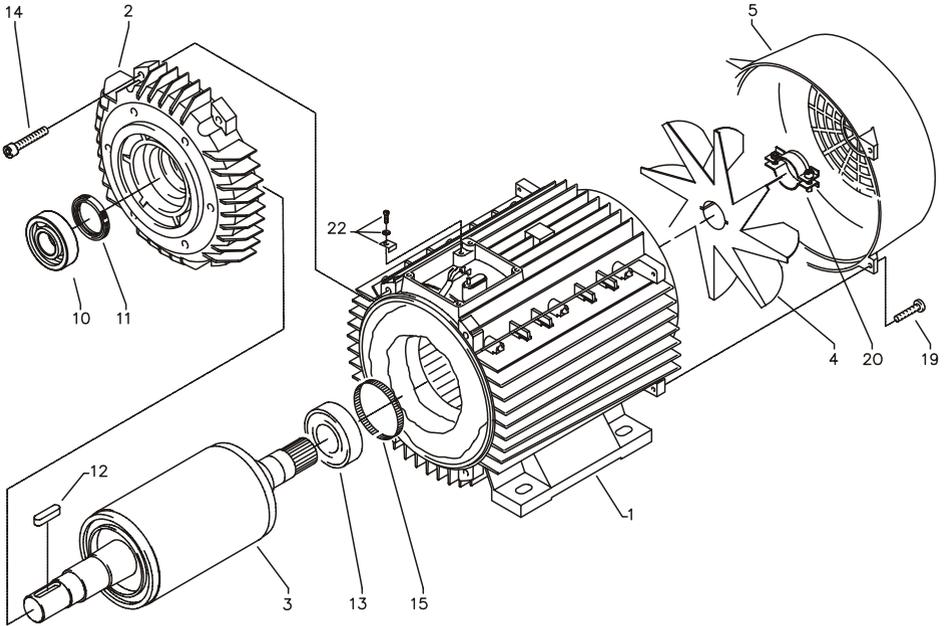


Kränzle therm C 13/180; 15/150

Spare parts list **KRÄNZLE therm C 13/180; 15/150** **Pump**

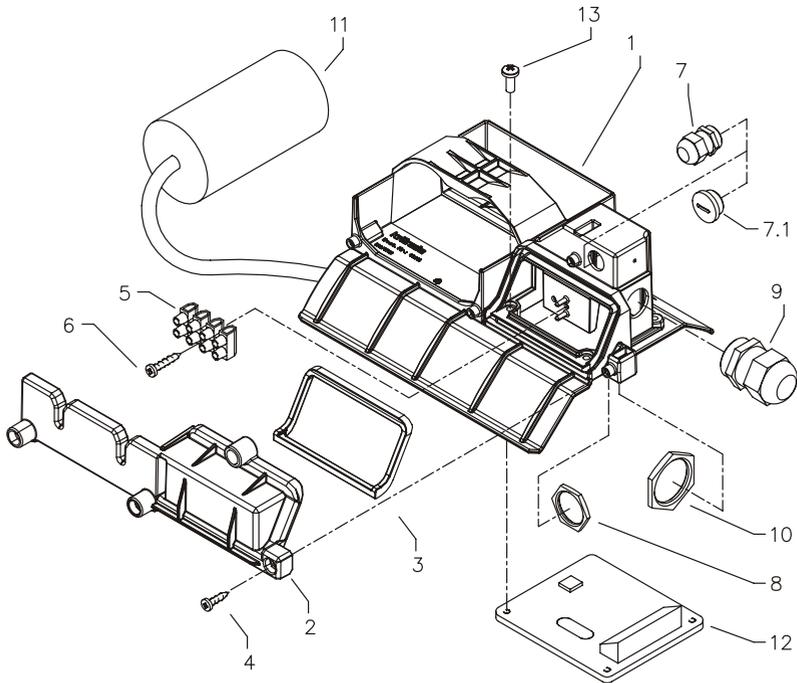
No.	Description	Qty.	Order No.
1	Ölgehäuse mit Öldichtungen	1	40.452
4	Innensechskantschraube M 8 x 25	6	40.053
5	Sicherungsscheibe	6	40.054
6	Flachdichtung	1	40.511
7	Öldichtung 18 x 28 x 7	3	41.031
8	Wellenscheibe	1	40.043
9	Axial-Rollenkäfig	1	40.040
10	AS-Scheibe	1	40.041
11.1	Swash plate 11,25° (C 13/180)	1	40.460-11,25
11.2	Swash plate 12,0° (C 15/150)	1	40.460-12,0
12	Plungerfeder	3	40.453
13	Federdruckscheibe	3	40.454
14	Plunger 18mm (AM-Pumpe)	3	40.455
15	Sprengring	3	41.035
16	O-Ring 14 x 2	2	43.445
17	Verschlusschraube 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 (AM-Pumpe)	1	40.461
23	Ölablassschlauch	1	44.128 1
24	Kupferring	3	14.149
25	Verschlusskappe	1	44.130
	Oil housing AM compl.		40.452 1
	Pos. 1, 4-7, 12-17		

Pump motor



No.	Description	Qty.	Order No.
1.1	Stator BG100 2,3kW 230V / 50Hz	1	40.720
1.2	Stator 100 4,8 kW 400V / 50Hz	1	40.710
2	A-Lager Flansch	1	40.700
3.1	Rotor BG100 230V / 50Hz	1	40.703 1
3.2	Rotor BG100 400V / 50Hz	1	40.703
4	Lüfterrad BG100	1	40.702
5	Lüfterhaube BG 100	1	40.701
10	Schräggkugellager 7306	1	40.704
11	Öldichtung 35 x 47 x 7	1	40.080
12	Passfeder 8 x 7 x 28	1	40.459
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 BG112	2	40.535
22	Erdungsschraube kpl.	1	43.038
	Motor compl. 2.3 kW 230V / 50Hz		24.085
	Motor compl. 4.8 kW, 3~ 400V / 50Hz		24.080

Terminal box

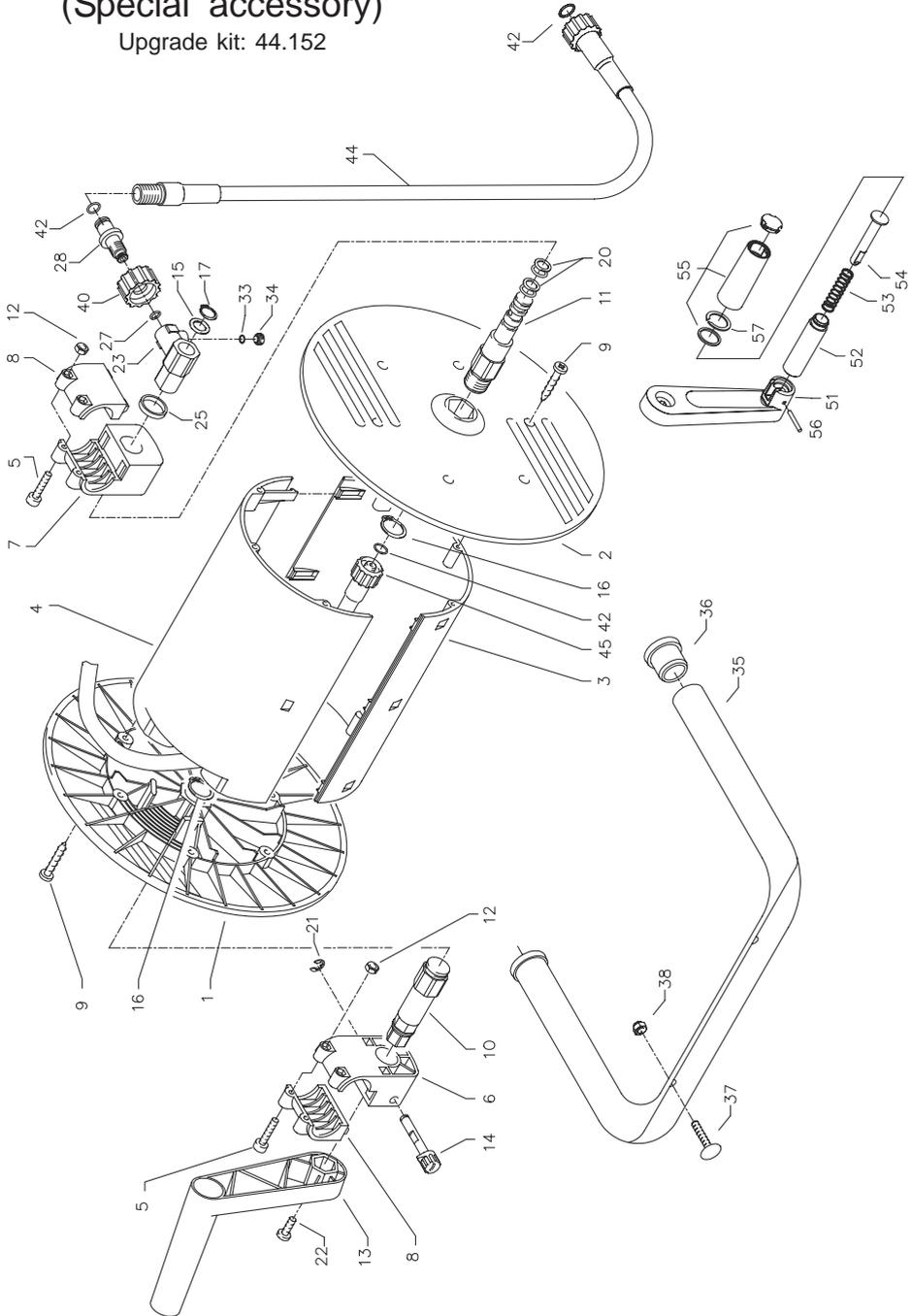


No.	Description	Qty.	Order No.
1	Klemmkasten	1	44.814
2	Deckel Klemmkasten	1	44.815
3	Dichtung Deckel	1	44.816
4	Schraube 5,0 x 14	3	43.426
5	Kunststoffschraube 3,5 x 20	2	43.415
6	Lüsterklemme 5-pol.	1	43.326 1
7	PG9-Verschraubung (C 13/180; C 15/150)	1	43.034
7.1	PG9-Verschlussstopfen (C11/130)	1	44.142
8	PG9-Gegenmutter	1	41.087 1
9	PG16-Verschraubung	1	41.419 1
10	PG16-Gegenmutter	1	44.119
11	Kondensator (C11/130)	1	
12	Flachdichtung	1	43.030
13	Schraube M 4 x 12	4	41.489
	Terminal box compl. 2.3 kW 230V / 50Hz		44.886
	Terminal box compl. 4.8 kW, 3~ 400V / 50Hz		44.887

Hose drum

(Special accessory)

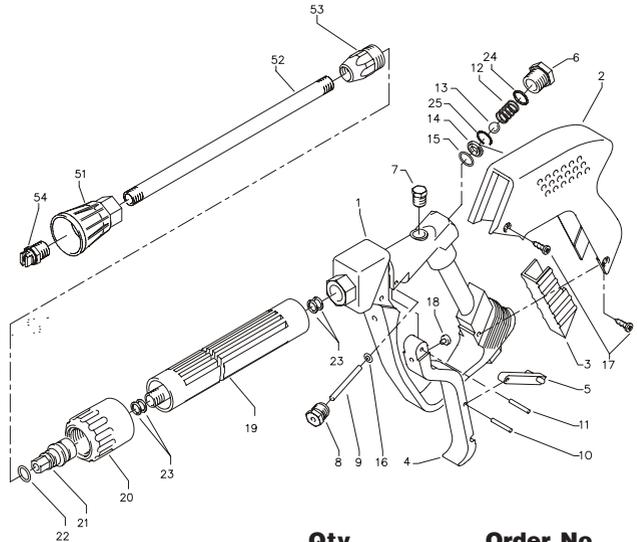
Upgrade kit: 44.152



Spare parts list KRÄNZLE therm Hose drum

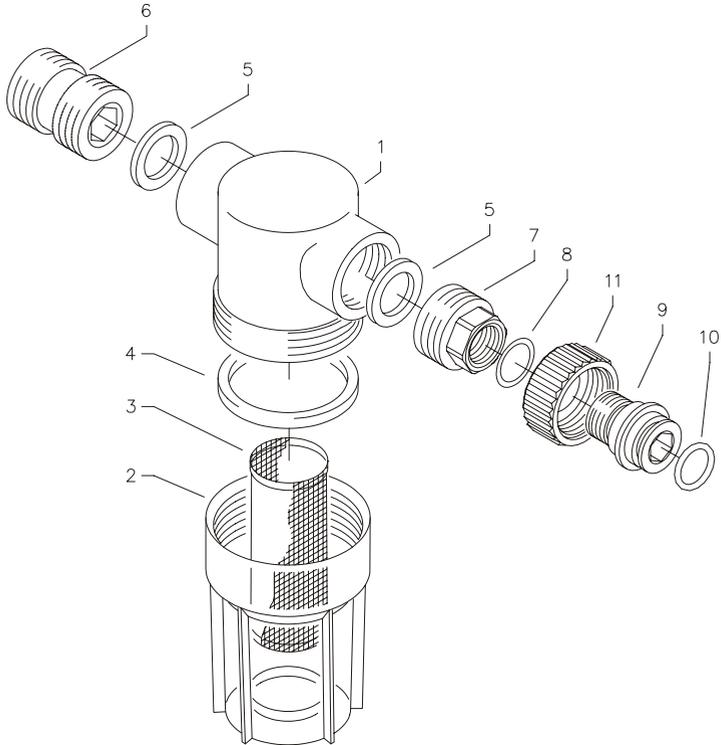
No.	Description	Qty.	Order No.	No.	Description	Qty.	Order No.
1	Seitenschale Schlauchführung	1	40.302	35	Haltebügel	1	44.143
2	Seitenschale Wasserführung	1	40.301	36	Gummistopfen	2	40.208 1
3	Trommel Unterteil	1	40.304	37	Schloßschraube M 8 x 40	2	44.159
4	Trommel Oberteil	1	40.303	38	Elastic-Stop-Mutter M 8	2	41.410
5	Innensechskantschraube M 4 x 25	4	40.313	40	Überwurfmutter	1	13.276 2
6	Lagerklotz mit Bremse	1	40.306	42	O-Ring 9,3 x 2,4	4	13.273
7	Lagerklotz links	1	40.305	44	Verbindungsschlauch NW 8 1 m	1	44.160
8	Klemmstück	2	40.307	45	Hochdruckschlauch NW 8 15 m	1	44.879
9	Kunststoffschraube 5,0 x 20	12	43.018	51	Kurbelarm	1	40.309 1
10	Antriebswelle	1	40.310	52	Hülse	1	40.309 2
11	Welle Wasserführung	1	40.311	53	Druckfeder	1	40.309 3
12	Elastic-Stop-Mutter M 4	4	40.111	54	Bolzen	1	40.309 4
13	Handkurbel klappbar	1	40.309 9	55	Griff mit Kappe und Gleitscheibe	1	40.309 5
14	Verriegelungsbolzen	1	40.312	56	Spannstift 4 x 28	1	40.309 6
15	Scheibe MS 16 x 24 x 2	1	40.181	57	Flachsprengring SW18	1	40.309 8
16	Wellensicherungsring 22 mm	2	40.117				
17	Wellensicherungsring 16 mm	1	40.182		Hose drum compl.		41.259
20	Parbaks 16 mm	2	13.159		without hose, without bracket		
21	Sicherungsscheibe 6 DIN6799	1	40.315				
22	Schraube M 5 x 10	1	43.021		Bracket compl.		44.143 1
23	Drehgelenk	1	40.167		consisting of: Pos. 35 - 38		
25	Distanzring	1	40.316				
27	O-Ring 6,86 x 1,78	1	40.585		Crank compl.		40.309 9
28	Anschlußstück	1	40.308		consisting of: Pos. 51 - 57		
33	O-Ring 6 x 1,5	1	13.386				
34	Stopfen M 10 x 1	1	13.385				

Gun



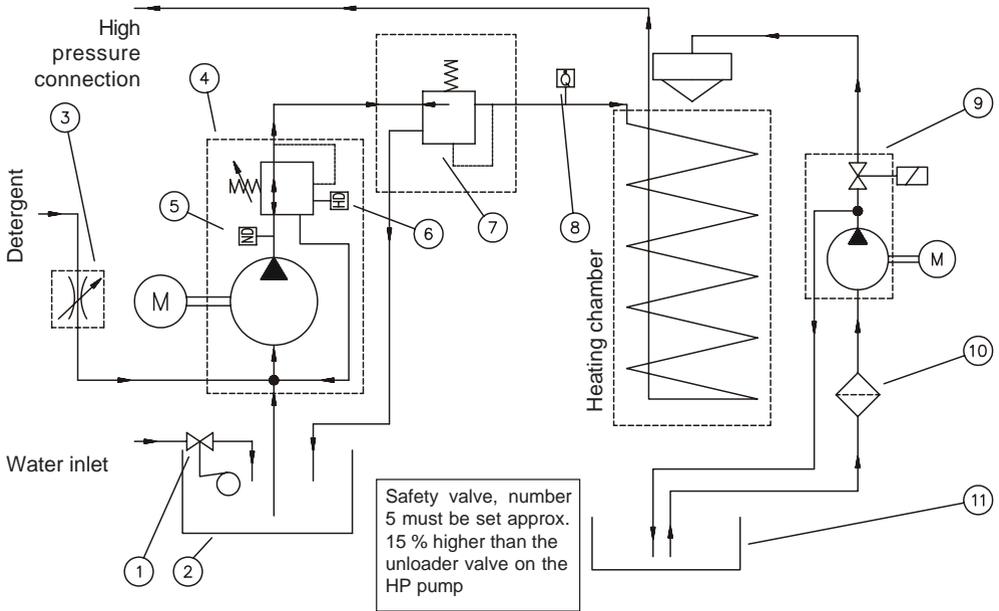
No.	Description	Qty.	Order No.
1	Ventilkörper mit Handgriff	1	12.294
2	Schutzhülse	1	12.295
3	Abdeckschutz	1	12.296
4	Betätigungshebel	1	12.298
5	Sicherungshebel	1	12.149
6	Abschlußschraube M 16 x1	1	12.247
7	Stopfen	1	12.287
8	Gewindeführungshülse R 1/4" AG	1	12.250
9	Aufsteuerbolzen	1	12.284
10	Stift	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	Blechschrabe 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	Flat jet nozzle 25045 (C 11/130; C 13/180)	1	D25045
54.1	Flat jet nozzle 25055 (C 15/150)	1	D25055
	Starlet-Gun compl. with prolongation 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			13.300 3
Pos. 1 - 11			

Pipeline plan



- | | | | |
|---|---|----|--------------------------------|
| 1 | Float valve, water inlet | 6 | Pressure switch Burner release |
| 2 | Water tank | 7 | Safety valve for heating coil |
| 3 | Control valve, detergent | 8 | Flow controller |
| 4 | High pressure pump with integrated unloader valve | 9 | Fuel pump with solenoid valve |
| 5 | Pressure switch Motor Start/Stop | 10 | Fuel filter |
| | | 11 | Fuel tank |

Warranty

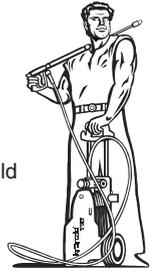
This warranty covers material and/or workmanship related defects only and does not extend to ordinary wear.

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

All products sold directly to private customers are warranted 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.



I. Kränzle GmbH
Elpke 97 . 33605 Bielefeld

EC declaration of conformity

We hereby declare,
that the high pressure models:

Kränzle therm C 11/130
Kränzle therm C 13/180
Kränzle therm C 15/150

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 guideline 2000/14/EC

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, 26.08.04

A handwritten signature in black ink, appearing to read 'Droitsch'.

Droitsch
(Managing Director)

Inspection sheet

Customer: _____

Mixing unit: MEKU

Number of slots: _____

Bore diam.: _____

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

Kränzle therm C _____

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 C** _____ 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 pressurebar		
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!)

Owner: _____ Type: **therm C** _____ 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 pressurebar		
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: _____

