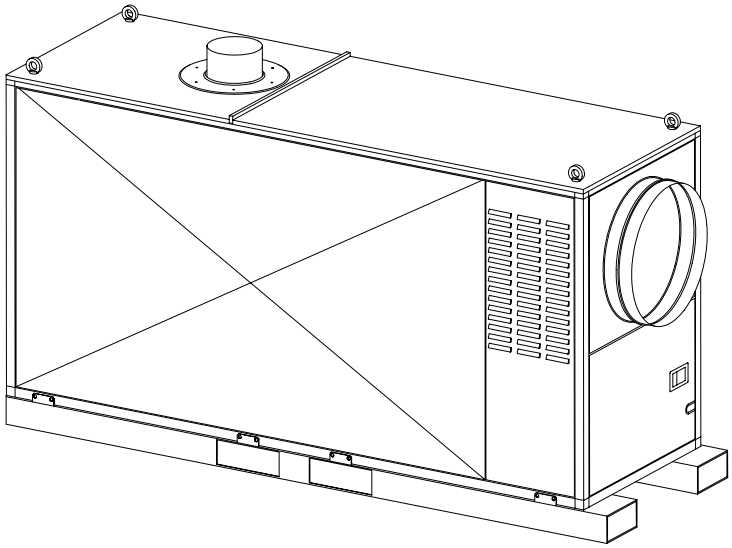
REMKO HTL 150 FB - HTL 250 FB
Mobile oil-fired heating centers



Operation
Technology
Spare Parts

Edition D – R02

REMKO – powerful like a bear.

Operating instructions

Read these instructions carefully before setting up/operating the unit!

Our guarantee becomes null and void if the unit is used, set up or maintained improperly, or if modifications are made to the supplied unit without our prior consent.
Subject to alterations!

Mobile oil-fired heating centers

REMKO HTL 150 FB

REMKO HTL 200 FB

REMKO HTL 250 FB

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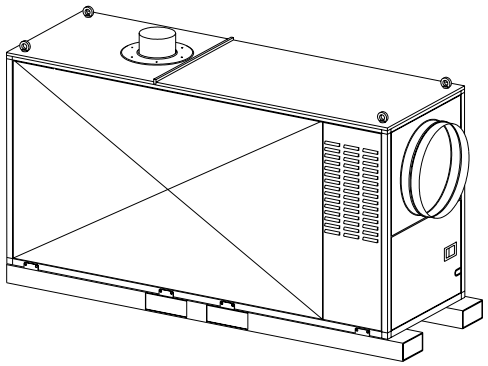

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Always keep these operating instructions near or on the unit!

Safety Instructions

Make sure to observe relevant local building and fire protection codes and abide by professional association regulations when the unit is in operation.

- ◊ The unit may only be operated by persons who have received training in its operation.
- ◊ The units must be installed and operated in such a way that people are not exposed to hazards such as exhaust, warm air or radiant heat and fires cannot occur.
- ◊ The units may only be installed and operated in closed rooms if the units have an adequate air supply for combustion.
- ◊ Portable fuel containers may only be set up if the technical regulations for combustible liquids “TRBF 210 and 280” are observed.
- ◊ If the units do not have **an exhaust outlet**, they may only be operated in well-ventilated rooms.
  People are not permitted to remain in the room where the units are set up for longer periods of time. Warning signs must be placed at the entrances.
- ◊ The unit may only be set up on a non-flammable surface.
- ◊ The unit may not be set up or operated in surroundings susceptible to fire or explosions.
- ◊ A safe distance off 1.5 m must be maintained around the unit; a distance of 3 m must be maintained from its exhaust opening, even for non-flammable objects.
- ◊ The air suction grille must always be kept free of dirt and loose objects.
- ◊ Never insert foreign objects into the unit.
- ◊ Do not expose the unit to a direct stream of water.
- ◊ All of the units’ electric cables are to be protected from damage, e.g. caused by animals, etc.
- ◊ Before performing any work on the unit, make sure to unplug the unit from the power supply.
- ◊ Safety mechanisms may not be bypassed or blocked.
- ◊ Use only prototype-tested WLE-type oil burners in accordance with DIN 4787 and DIN-EN 267

☝ **The units are not designed for permanent fixed installation.**

Proper Use

These devices have been designed and equipped exclusively to be used for heating and ventilation for industrial and commercial purposes.

The manufacturer is not liable for any damage resulting from non-adherence to manufacturer specifications, legal requirements or any modifications to the units.

Description of Device

The units are fired directly with heating oil or diesel. They are designed for fully-automatic, universal and reliable use.

The units are equipped at the factory with a large-volume fuel preheater as well as a heating oil filter protected from weather conditions. They are operated with a separate forced-air oil burner and are suitable for outdoor operation.

The units are equipped both with a high-performance axial fan that requires little maintenance and integrated switching and regulating units. They also have an optical display which shows the individual operating functions.

The units have a sturdy framework design on robust transport runners.

To ensure that the units can be operated over a period of many years, particularly outdoors, the framework and the lining plates are made of rust-proof stainless-steel. In addition, all of the construction parts inside the unit are also made of non-corrosive materials.

The compact design of the units makes them easy and affordable to assemble quickly and guarantees that they are easy to service.

The unit meets the basic safety and health requirements found in the relevant EU regulations and is easy to operate.

Locations for unit operation

The units are direct-fired, warm air heaters that supply instantaneous heat. They are only used for commercial purposes.

The units are used in the industrial area when portable units are required to heat or regulate the temperature of, for example:

- – Warehouses
- – Exhibition spaces
- – Trade shows
- – Large tents
- – Temporary structures for warehousing
- – Large construction sites

There are generally no restrictions as to where they can be used for temporarily heating buildings due to their weatherproof design.

Functionality

If the unit is switched to heating mode, the forced-air oil burner switches on automatically. The green “burner“ operating light is illuminated on the control panel for monitoring purposes. If heating mode is controlled by a room thermostat, the forced-air oil burner starts only when heat is required.

The combustion chamber with heat-exchanger is heated up until the temperature monitor switches on (target temperature of 80 to 85 °C). The temperature regulator (target temperature 35 to 40 °C) automatically switches the air supply fan on beforehand. The green “fan“ operating light is illuminated on the control panel for monitoring purposes. Warm air is blown out.

When the room thermostat is in operation, the process above is automatically repeated depending on the amount of heat required.

After the device is switched off with the operating switch or the room thermostat, the air supply fan runs for a certain amount of time to cool the combustion chamber with heat-exchanger and then switches off. This process can be repeated several times.

Monitoring Unit Operation

All functions of the device are her carried out fully automatically and monitored for safety by the three-speed combination regulator and the automatic burner relay (part of the forced-air oil burner).

If the flame burns irregularly or goes out, the unit is switched off by the automatic burner relay. The control lamp on the control panel and the red malfunction lamp “Burner” light up.

The unit may only be restarted after the automatic burner relay has been manually released by pressing the “Burner” reset button on the control box.

The temperature control thermostat (TR) regulates operation of the fan. The temperature monitor (TW) limits the temperature of the air blown out of the unit in heating mode via the forced-air oil burner.

The safety temperature limiter (STB) interrupts operation of the unit or burner when extreme overheating occurs or if the TW stops working or is defective. The red malfunction light “Overheating” is illuminated on the control panel.

The STB is released by pressing the “Overheating” button on the control panel. The STB can only be manually released after the unit has cooled.

Before releasing the safety temperature limiter (STB), the possible causes of the malfunction must be identified.

The fan motor is monitored by a thermal overcurrent relay. If the capacity of the motor is overloaded, operation is interrupted by the relay and the red malfunction light “Fan” is illuminated on the control panel.

All electrical components are also protected by safety mechanisms. They can only be reset once the control box has been opened. Prior to opening the control box, the unit must be unplugged from the power supply.

Prior to resetting the unit, the causes of the malfunction must be identified.

Safety Mechanisms

Three-speed combination regulator in accordance with DIN 3440

The unit has 3 functions:

- ◊ Fan regulator (TR)
- ◊ Temperature monitor (TW)
- ◊ Safety temperature limiter (STB)

Fan regulator (TR)

The temperature control thermostat switches the circulation fan on and off. The activation point is set by means of the adjustment lever.
Target value approx. 35 °C.

Temperature monitor for the burner (TW)

The temperature monitor limits the temperature of the units and the air being blown out via the burner in heating mode. The activation point is set using the adjustment screw on the target value spindle.
Target value approx. 85°C.

Safety temperature limiter (STB)

The STB controls the temperature monitor. There is a button that, when pressed, prevents the burner from the restarting. The reset button on the control box must be pressed
The activation point is fixed in accordance with DIN 3440.

Information about the safety mechanisms

The sensors of the safety mechanisms are self-monitoring and can work at cold temperatures of down to -20 °C. At temperatures below 20 °C, they switch off and when the temperature rises, they switch back on again.

When the sensor or capillary tube is damaged, or when an excess temperature of approximately 220°C is reached, the liquid contained in the thermostat is emptied and the safety mechanism switches the unit off. The temperature control thermostat is no longer operable and must be replaced.

If the three-speed combination regulator needs to be replaced, only use the original REMKO-spare part ref. no. 1102562.

Make sure to observe the following:

- ◊ Make absolutely sure that the units are carefully installed and assembled.
- ◊ Do not bend the capillary tubes close to solder points.
- ◊ When installing the capillary tubes, be careful not to damage or bend them too sharply.
- ◊ The sensors may only be mounted at the attachment points created for this purpose at the factory.
- ◊ The sensors must always be kept free of dirt and dust.

Unit Assembly

When setting up the units, the relevant regional building and fire protection codes of the respective region must be observed.

When selecting an indoor or outdoor location to set up the units, the settings must be adjusted with respect to:

◊ Fire protection and operating hazards

◊ Maintenance of adequate safety zones

◊ Function
Room heating, free-standing or canal system, excessive or low pressure in the setup room.

◊ General requirements
Heating needs, room temperature, rated air output, air distribution, need for circulation or outside air, space needs, etc.

◊ Exhaust system

◊ Assembly, repair and servicing options

◊ Indoor setup
Ratio of room volume to rated air capacity especially for naturally ventilated rooms.

Setup

◊ The units must be placed firmly on a suitable, non-flammable surface outside of traffic zones, for example, away from cranes.

◊ If the surface is soft, appropriate substructures must be set up such as scantlings below the transport, runners.

◊ When doing work on the units, make sure that the units are current-free and set up horizontally.

◊ The units must be set up and operated in such a way that people are not exposed to exhaust or radiant heat and fires cannot occur.

◊ The units must be set up in such a way that they do not cause any hazards or unreasonable annoyances.
Tremors, vibrations or noise.

◊ The units must be set up and installed in such a way that they are easily accessible for repair and maintenance work.

◊ Operating elements which can result in dangerous operating conditions when used improperly must be protected from unauthorised .

◊ The units may not be set up or operated in rooms or areas susceptible to fire or explosions.

◊ The unit may only be set up and operated in rooms if there is an adequate supply of air for combustion and the exhaust is expelled via exhaust flues.

◊ A natural air supply sufficient for combustion exists when, for example,
- the room content in m³ is equivalent to at least 10 times the rated heat output in kW of all heating units in operation in the room and natural air ventilation is supplied through windows and doors.

◊ Good natural ventilation exists when, for example,
- the room content in m³ equals 30 times the rated heat output of all units in operation in the room and natural ventilation is supplied through doors and windows .

Expulsion of exhaust

When the units are operated outside or in open rooms you do not need an exhaust system.

However, to safely expel exhaust, an exhaust pipe 1 m long with a rain cover (accessory) should be attached to protect people and keep rain from getting into the combustion chamber.

For indoor setup (closed rooms) an appropriate exhaust system that meets the valid regulations is required.

Important information about longer exhaust lines

To prevent damage to the combustion chamber caused by moisture build-up (condensation) for longer exhaust lines, make sure that the exhaust gas pipe has a properly installed condensation trap.

Fuel supply

The customer must ensure that certified safety tanks provide an adequate fuel supply.

◊ You must observe any additional regulations of the respective regional building codes as well as the technical regulations for combustible liquids “TRBF 210 and 280".

◊ Particularly for heating oil lines, make sure that the cross-section of the lines corresponds to the suction height, the total line resistance and increased viscosity at lower temperatures. If necessary, it is possible to connect an oil transport device.

◊ The suction line must be equipped with a valve at the end of the hose in the tank.

◊ To ensure that operation in heating mode is as smooth as possible, there must be an adequate quantity of heating oil available that can flow even at low outdoor temperatures. Appropriate measures, for example, the use of a tank heater, must be undertaken to ensure that boil can flow freely.

Paraffin can accumulate at temperatures starting at approximately 5 °C!

Electrical connection

◊ The units are operated with 400/3~N/50.

◊ The unit must be connected to the power source at a special terminal equipped with a switch to protect against faulty currents in accordance with VDE 0100 § 55.

◊ The design of the connection cable depends on the unit's electrical capacity and the length of the cable and takes into account the local conditions.

◊ Extension cords may only be used if they are completely unrolled or rolled up.

Warm air distribution

The units are equipped with a high-performance axial fan that requires little maintenance. This fan has been designed, depending on the requirements, to direct the warm air efficiently.

It is preferable to distribute air by means of pipes or special hot air and plastic hoses. The possible lengths of these lines depend on the air-side resistance of the warm air ducting.

Make sure to observe the following when using warm air hoses:

◊ Use only warm air hoses (accessories) approved by our company.

◊ The inner overlappings of the seams of the warm air hoses must point in the direction of the air.

◊ Make sure that the hoses and/or pipes are securely attached to the unit's air outlet connection.

◊ To prevent heat from building up, the pipes and hoses may not have sharp kinks and bends.

◊ We recommend using folded spiral-seam pipes.

◊ Use warm air or plastic hoses only for straight air lines if possible.

◊ Plastic hoses may not be twisted.

◊ When heating closed rooms via warm air lines, no counter pressure may not build up.

◊ If the suction temperatures or resistance on the unit outlet increases, the forced-air oil burner can be switched off in heating mode temporarily by the temperature monitor (TW).
Once the temperature has fallen, the burner switches are again automatically.

◊ If the intervals are too short, the length of the warm air line should be checked.

Avoid starting the forced-air oil burner in frequent cycles (under 5 min.).

If blockages cause the unit to heat up, heating operation is permanently interrupted by the STB!

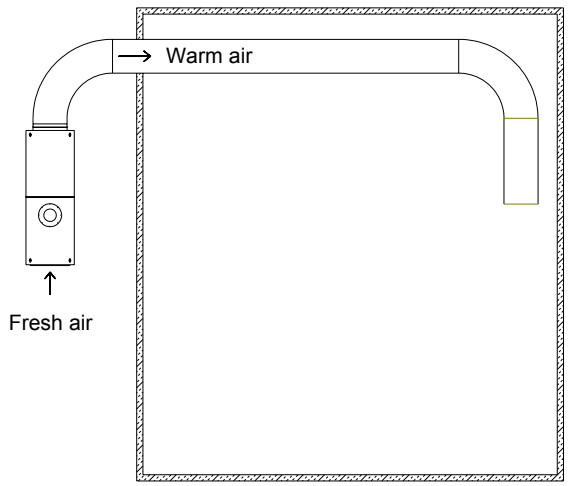
Operating modes

The units can be used in the fresh air and circulation modes.

Fresh air mode

Air is taken in at the back of the units (factory made).

Schematic diagram (example)



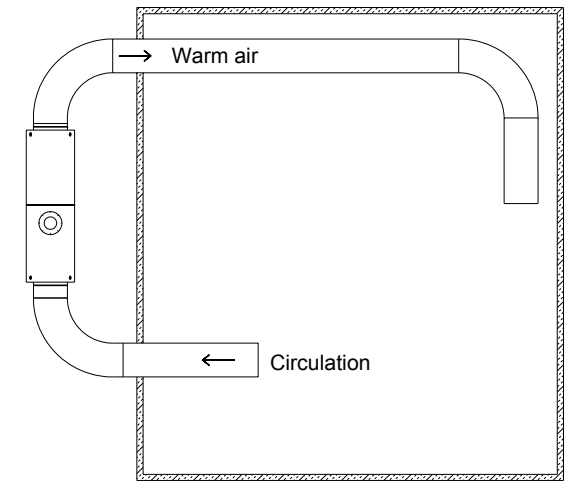
Circulation mode

A pipe adapter (accessory) on the suction side is necessary for pure circulation mode.

◊ Air lines her hold their shape must be placed on the intake side.
Do not use unstable lines.

◊ When setting up the unit outside, a folded spiral-seam pipe or similar device should be used for circulation.

Schematic diagram (example)



Prior to Operation

Prior to initial operation, check the unit for any visual defects on the control and safety mechanisms, make sure that it has been installed correctly and that it has been properly connected to the power supply.

The exhaust values of the forced-air oil burner must be checked and adjusted by authorised personnel in line with the respective on-site conditions.

After installation of the complete air distribution system, the following checks should be performed by trained personnel to ensure that the fan always runs properly!

Measuring the rated power and power consumption

1. For correct measurement, attach all pipes to the outlet and intake sides and open any outlet grilles.
2. Check the available power supply.
3. Make sure that the rated current (amperes) specified on the motor type plate is not be exceeded.

Setting the thermal overcurrent relay

1. Measure each phase separately to eliminate measurement errors.
2. Set the thermal overcurrent relay according to the following calculation:

   Multiply the rated current of the drive motor by 0.58 and adjust the thermal overcurrent relay to the calculated value.
3. Check the function of the overcurrent relay and its set value by simulating a missing phase.
   By switching off a fuse, etc.
4. Keep in mind that if the relay is functioning and set properly, it will start after approximately 30 seconds.

Caution, important information about the overcurrent relay!

The thermal overcurrent relay may only be operated when set to “Manual Reset”. The relay may not be switched back on again automatically after cooling.

If the overcurrent relay is operated in “Automatic Reset” mode, it is possible that the motor will be damaged. We assume no liability for the guarantee!

Power consumption too high

If the motor is consuming too much power despite having a proper electrical connection and adequate power supply, the thermal overcurrent relay may not be set higher or bypassed under any circumstances.

◊ Take appropriate measures to fix the problem, e.g. by checking or adjusting the diameter of the intake and outlet on the air side.

Initial Operation

A person who has been adequately trained in how to operate the unit is to be given responsibility for operating and monitoring it.

Starting the unit

1. Open the door on the back of the unit.
2. Ensure that the operating switch on the control box is set to “0” (off) .
3. Place the room thermostat in a suitable location. *The thermostat sensor may not be in the warm air current nor attached directly to a cool surface.*
4. Connect the room thermostat to the thermostat socket on the control box.
5. Set the room temperature you want on the room thermostat.
   The setting must be higher than the current room temperature.
6. Connect the unit to a properly installed and fused power socket.

Extension cords may only be used if they are completely unrolled or rolled up .

7. Check whether the green control lights for phases and control phase are lit up on the control box.
8. Open all shut-off mechanisms of the fuel supply.
9. Set the operating switch on the control box to “I” (heating).
10. Remember that the forced-air oil burner does not switch on immediately when heat is required, the air supply fan only switches on once the target temperature has been reached.
11. Check whether the operating lights for the burner and fan are lit up on the control box.
12. Close the door.
13. Lock the door to protect the unit from unauthorised operation.

Operating mode

The unit operates fully automatically according to the pre-selected room temperature.

If the suction temperatures or resistance on the unit output increased, the burner can be temporarily switched off during heating mode by the temperature monitor (TW).

After the temperature has fallen, the burner automatically starts again. You should avoid starting the burner frequently during unit operation.

If the temperature increases too much on the air outlet, the STB interrupts heating mode permanently!

The maximum air suction temperature may not exceed 30 °C.

Circulation mode

In this operating mode, only the air supply fan runs and the unit can be used to circulate air.

Thermostat regulation and heating operation are not possible.

1. Set the operating switch on the control box to "II" (= ventilate).

Shutting Down the Unit

1. Set the operating switch on the control box to "0" (off).
2. Shut off the fuel supply.

Important information about the cool-down phase of the unit.

The air supply fan continues to run to cool the combustion chamber and the heat-exchanger and switches off at a later time.

The fan can be run several times until the unit is finally switched off.

Never interrupt the power supply (except in emergencies) before the cool-down phase is complete.
We assume no liability for damage to the unit by overheating.

Troubleshooting

The unit doesn't start

1. Check the power connection and the power fuses.
2. Set the operating switch to "I".
3. Make sure the plug of the room thermostat is positioned properly.
4. Check the setting of the room thermostat.
   The set temperature must be higher than the current room temperature.
5. Check the fuses F1 and F6 in the control box.
6. Check whether the safety temperature limiter was triggered. In this case, release it by pressing the "Overheating Reset" button on the control box.
7. Prior to a STB reset, you must analyse the causes and fix this problem.
8. Set the operating switch to "II" (ventilating).
   If the air supply fan now starts, look for the problem with the burner.

The burner doesn't start

1. Open the shut-off valve on the oil filter.
2. Check the oil filter for dirt.
3. Make sure that the fuel tank has an adequate amount of fuel.
4. Check the heating oil for paraffin accumulation.
   Paraffin can build up at temperatures as low as 5 °C!
5. Check the oil lines for damage.
   There is a danger that there are air bubbles in the lines.
6. Check whether the safety temperature limiter (STB) was triggered.
   This could be caused by the following:
   - The unit was not able to cool down because the power supply was interrupted.
   - The air outlet temperature is too high because air is not being directed properly.
   - Air cannot flow freely in and out.
7. Prior to a STB reset, you must analyse the causes and fix this problem.
8. Check that the temperature monitor (TW) is functioning properly using appropriate means.
9. Check the sensors and the capillary pipes of the three-speed combination regulator for damage and dirt.
   See "Safety Mechanisms" chapter.
10. Check whether the "Burner" malfunction light is lit up. If so, release the burner by pressing the "Burner Reset" button on the control box.
    The burner tries to start.

Important information about releasing the burner

◊ If the burner switches off again due to a malfunction during the start phase, it may only be reset after waiting 5 min.

◊ Resetting the burner again is strictly prohibited. There is a danger of explosion.

The air supply fan does not start

1. Check whether the "Fan" malfunction light is lit up. If so, to press the "Fan Reset" button on the control box.
2. Check the fuses F1 to F3 in the control box.
3. Check the control fuse F6 in the control box.
4. Check the electrical cord to the fan for damage.
5. Check that the temperature regulator (TR) is functioning properly with appropriate means.

Repair and maintenance work on the burner or electrical installations may only be performed by authorised personnel for safety reasons.

Maintenance and Service

Regular maintenance and observance of some basic principles are required to ensure a long service life and to keep the unit functioning properly.

The power cord must be unplugged before any work is done on the unit.

You must observe the following:

- ◊ Keep the unit free of dust and other deposits.
- ◊ Use a clean, slightly moist cloth to remove external dirt from the surface of the unit.
- ◊ Do not expose the unit to a direct stream of water. *High-pressure cleaners, etc.*
- ◊ Do not use any abrasive cleaning agents, those that contain solvents or are harmful to the environment.
- ◊ When the unit is extremely dirty, use only suitable cleaning agents.
- ◊ Use only clean heating oil or diesel
  Keep paraffin from accumulating, do not use biodiesel.
- ◊ Check the fuel filters for dirt on a regular basis.
  Replace dirty filters if necessary.
- ◊ Check the unit for mechanical damage and replace defective parts if necessary.
- ◊ Check the fan blades and combustion chamber with heat-exchanger on a regular basis for dirt and clean them if necessary.
- ◊ Check the customer-installed oil tanks for dirt and foreign bodies on a regular basis and clean them if necessary.
- ◊ Make sure that the exhaust gas and combustion air can always be properly expelled.
- ◊ Regularly check the safety mechanisms to ensure that they are working properly.
- ◊ Always keep the sensor of the three-speed combination regulator free of dust and dirt.
- ◊ Have the forced-air oil burner checked by authorised personnel on a regular basis to ensure that the exhaust values are correct.
  For safety purposes, we recommend entering into a maintenance contract.
- ◊ Observe the regular maintenance and service intervals.
- ◊ When not in use, store the unit in a place that is dry and free of dust.

Adjustment and maintenance work may only be performed by authorised personnel.

Cleaning

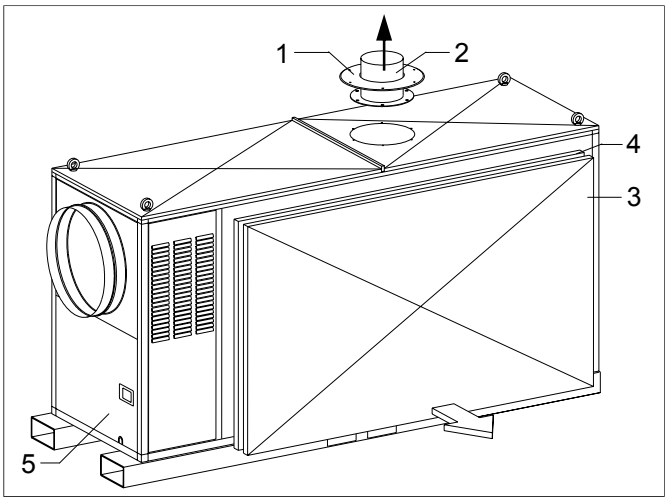
The complete unit including heat-exchanger, combustion chamber and forced-air oil burner must be cleaned for dust and dirt after every heating period or before if necessary, depending on the operating conditions.

Parts subject to wear and tear, such as flue gas brakes, seals, oil filter inserts and oil nozzles are to be checked and replaced if necessary.

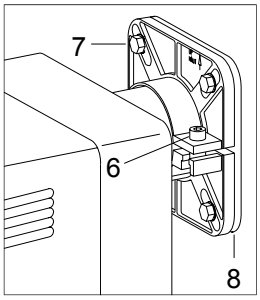
Removing the combustion chamber

To clean the unit, it is necessary to completely remove the combustion chamber with heat-exchanger.

1. Set the operating switch on the control box to “0” (off)
2. Unplug the power supply.
3. Remove the fixing screws of the rosette **1**.
4. Pull the rosette from the exhaust gas connection **2**.
5. Remove the exhaust gas connection from the combustion chamber and pull it up and out.
6. Remove the lining plate on the side **3** and the insulation **4**.
7. Open the front lock cover **5**.



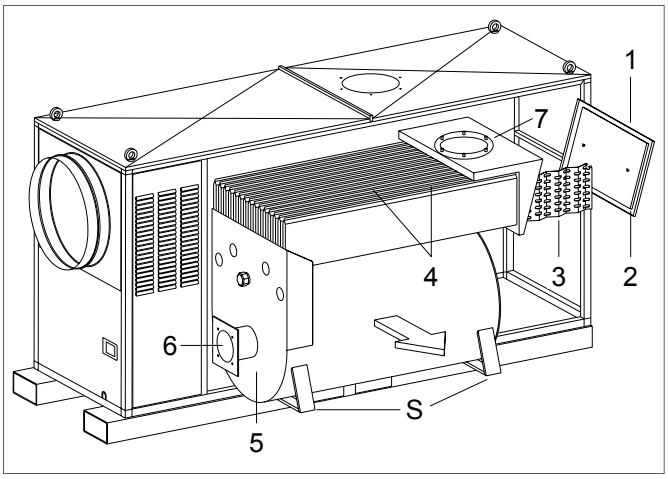
8. Remove the attachments grew **6** and pull the burner out.
9. Remove the fixing screws **7** on the burner flange and remove the burner flange.
   *Do not damage the flange seal **8** when doing so*



10. Remove the fixing screws on the combustion chamber supports.
11. Pull the combustion chamber out to the side.
12. **Remember**: the combustion chamber supports S may not be bent or damaged!
    See Fig. on page 11.

Cleaning the heat-exchanger and combustion chamber

1. Remove the inspection cover **1**.
2. Remove the flue gas brakes **3**.
3. Clean all exhaust gas passages **4**.
   A special cleaning brush can be purchased as an accessory.
4. Clean or replace the flue gas brakes.
5. Check or replace the seals **2** of the inspection cover.



6. Clean the combustion chamber **5** with a vacuum cleaner through the burner opening **6**.
   Special boiler cleaning sets can be purchased as accessories for the REMKO industrial vacuum cleaner.

Burner maintenance

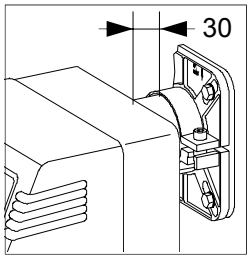
1. Have the forced-air oil burner checked by authorised personnel on a regular basis to ensure that the settings are correct
2. To service the burner, please observe the instructions and information in the operating instructions.
3. For safety purposes, we recommend entering into a service agreement!

Reassembly and reinstallation of the burner

1. Put together the disassembled parts in the opposite order
2. Make sure that the inspection cover is positioned properly and that the fixing screws are all tightened uniformly.
   If fixing screws are not tightened uniformly, this can cause leaks!
3. Place the combustion chamber carefully into the unit and align it properly.
4. Loosely turn the fixing screws of the combustion chamber.

Assembling the burner flange and the burner

1. Check the flange seal and replace it if necessary.
2. Attach the burner flange with the four screws to the unit housing.
   Pay attention to the "OBEN" (UP, HAUT) label!
3. Tighten the upper screws.



4. Tighten the lower screws only slightly so that the burner flange can still be pulled together.
5. Slide the flame tube of the burner into the burner flange. *Keeping a distance of 30 mm.*
6. Attach the flame tube to the flange by lifting the burner slightly (3° incline).
7. Finally, tighten the lower screws.

Final steps

1. Tighten the fixing screws of the combustion chamber firmly.
2. Attach the lining plate and insulation.
3. Attach the exhaust connection properly.
   *Check the seal **7** and replace if necessary*.
4. Reattach all lines and connections and check them.
5. Put the unit into operation and check that all operating modes are working properly.

Exhaust gas losses are to be restricted in accordance with §11 of the German Law on emissions for small gas-fired units.

Customer Service and Guarantee

For the guarantee to be valid, the customer must completely fill out the "**guarantee certificate**" enclosed with all heating units and send it back to REMKO GmbH & Co. KG in a timely manner after purchasing the unit and putting it into operation.

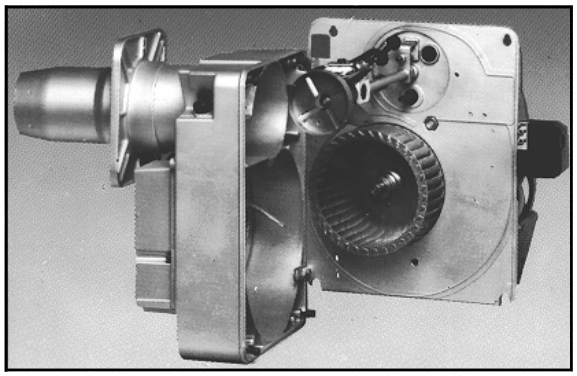
The units have undergone several tests to ensure proper functioning at the factory. If there are still malfunctions that cannot be fixed by the operator using the troubleshooting instructions, please contact your dealer or contract partner.

An operation/use other than indicated in these instructions is prohibited!
In the case of non-compliance, we assume no liability and our guarantee becomes null and void.

Forced-Air Oil Burner

After loosening the 4 housing screws and the additional 2 screws (pay attention to the arrow), the assembly base plate is removed from the housing and suspended to the side.

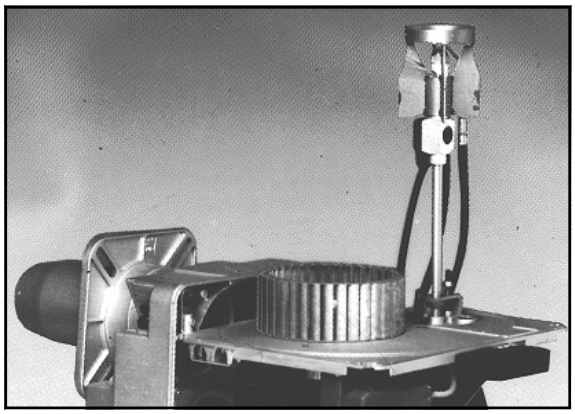
The most important functional components for maintenance are immediately accessible.



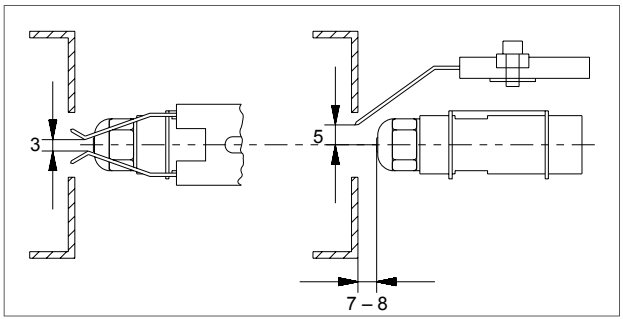
The assembly base plate can also be suspended horizontally for maintenance, installation and replacement of the nozzle.

Proceed as follows:

1. Hold the assembly base plate horizontally.
2. Slide the right mount sideways into the suspension.
3. Suspend the left side up into the lug..



Adjusting the ignition electrode and swivel disc



All dimensions are approximate values in mm. The optimum setting must be adjusted to the local and structural conditions.

Adjusting the air intake nozzle

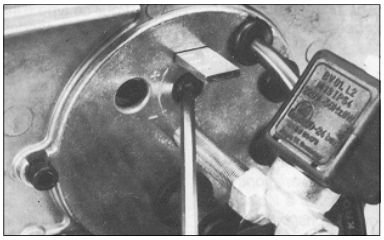
The necessary burner pressure can be adjusted without changing the outlet diameter using the adjustable air intake nozzle depending on the combustion chamber resistance and chimney draft.

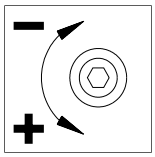
Loosen the Allen screw and rotate the air intake nozzle to the desired position (pay attention to the arrow).

"min" = lower burner pressure
"max" = higher burner pressure

After the nozzle has been changed and the air intake nozzle adjusted, the assembly base plate is reinserted in the reverse order.

Adjusting the secondary air
(nozzle connection rod setting)





Left rotation (+) = higher scale value
⇨ lower pressure behind the swivel disc
⇨ higher performance range.

Right rotation (-) = lower scale value
⇨ higher pressure behind the swivel disc
⇨ lower performance range.

Adjusting the pump pressure

The oil pressure must be adjusted and/or checked prior to operation and maintenance.

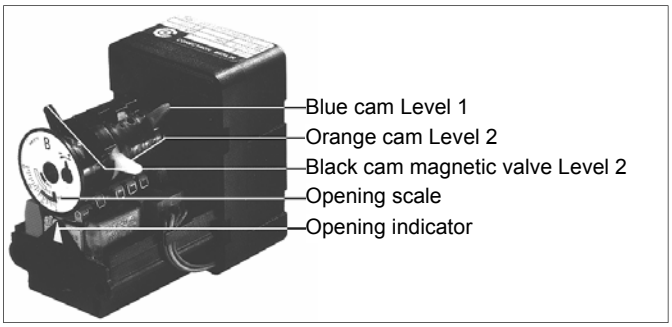
Do not run the pump without oil!

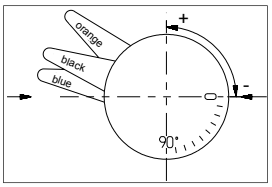
1. Remove the plug on the "P" measuring connection. *Pay attention to the seal.*
2. Open all oil shut-off mechanisms and switch the burner on with the unit operating switch.
3. Adjust the necessary oil pressure in accordance with the nozzle size and the unit capacity.
4. Remember that the required oil pressure first has to be set for the full capacity phase (DV2) and then the oil pressure for the start-up phase (DV1) because the pressure adjustment DV2 can also affect DV1.
5. Switch the burner off on the unit operating switch.
6. Disassemble the manometer and reinsert the plugs with seals.

The burner may only be operated at the second level. The first level may only be used as start-up relief!

Adjustment motor function

The adjustment motor has three set positions as well as an activation contact for the “Magnetic valve level 2”.

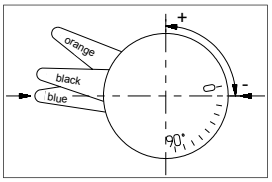




Air flap closed

Air flap closed

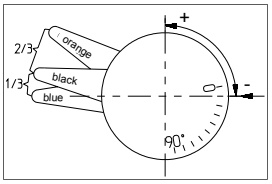
If the burner is not in operation, the adjustment motor is set to air flap closed (scale: 0).
This position (rear cam without adjustment lever) is set at the factory and may not be changed.



Air quantity “Level 1”

Air quantity “Level 1”

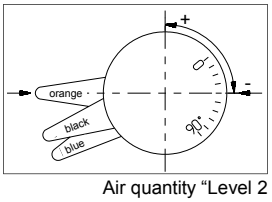
For pre-ventilation, starting and operation at a “lower” performance, the adjustment motor rotates to the activation point of the **blue** adjustment lever.
This results in a fixed opening angle for the air flap and a constant quantity of air for the first level.
This adjustment lever can be used to regulate air quantity “Level 1” for different air quantities ; standard value: approx. 30°.



Activation point “Magnetic valve 2

Activation point “Magnetic valve 2“

The **black** adjustment lever “Magnetic valve 2” should be placed a third of the way between the **blue** and **orange** levers.



Air quantity “Level 2

Air quantity “Level 2”

If the burner is released for the second level, the adjustment motor rotates to the activation point of the **orange** lever.
While rotating, the black lever releases the oil quantity for the second level; standard value: approx. 50°.

Adjusting the air flap

The air flap is opened or closed until the soot pattern displays an oil-free colour, soot “0 - 1” and value 12-14 % for the CO_2. When making the adjustment, keep in mind that when there is a lot of excess air, the soot increases again and oil can reappear in the soot pattern. If, when the air flap is completely open, the flame emits soot or does not burn evenly, the pressure behind the swivel disc must be reduced with the adjustment screw.

Setting “Air quantity level 1”
(adjustment lever **blue**)

Unplug the 4-pin multi-purpose connection.
Thermostat level 2.

Turn the **orange** adjustment lever “Air quantity Level 2” and the **black** adjustment lever “Magnetic valve 2” clockwise until both activation cams are initially not pressed down so that the setting the activation cam for the “Air quantity 1” is not blocked.

Less air Level 1:

Set the blue adjustment lever counter-clockwise to the smaller opening angle. When the burner is running, the adjustment motor automatically adjusts.

More air Level 1:

Set the blue adjustment lever clockwise to the larger opening angle. When the burner is running, the adjustment motor automatically adjusts.

Activation point “Magnetic valve 2”
(adjustment lever **black**)

The adjustment lever for “Magnetic valve 2” is now rotated back counter-clockwise and the activation point “Air quantity 2” is placed briefly behind the “Air quantity 1” activation point. This activation point works between the positions “Air quantity Level 1” and “Air quantity Level 2”.

Important information

Please make sure that the activation cam from “Magnetic valve 2” is not pressed before activation cam “Air quantity level 1” because otherwise the “Magnetic valve 2” in the “Air quantity 1” area opens and the burner would run with an insufficient quantity of air.

Setting “Air quantity level 2”
(adjustment lever **orange**)

Turn back the adjustment lever for the “Air quantity level 2” counter-clockwise. Determine the activation point for the “Air quantity level 2” based on the burner capacity behind the activation point “Magnetic valve 2”. Plug in the 4-pin multi-purpose connection of thermostat level 2 again.

Less air Level 2:

Set the **orange** adjustment lever counter-clockwise to the smaller opening angle. Switch to the burner briefly back to Level 1.
After the unit is switched back to Level 2, the adjustment motor’s speed adjusts to the changed quantity of air.

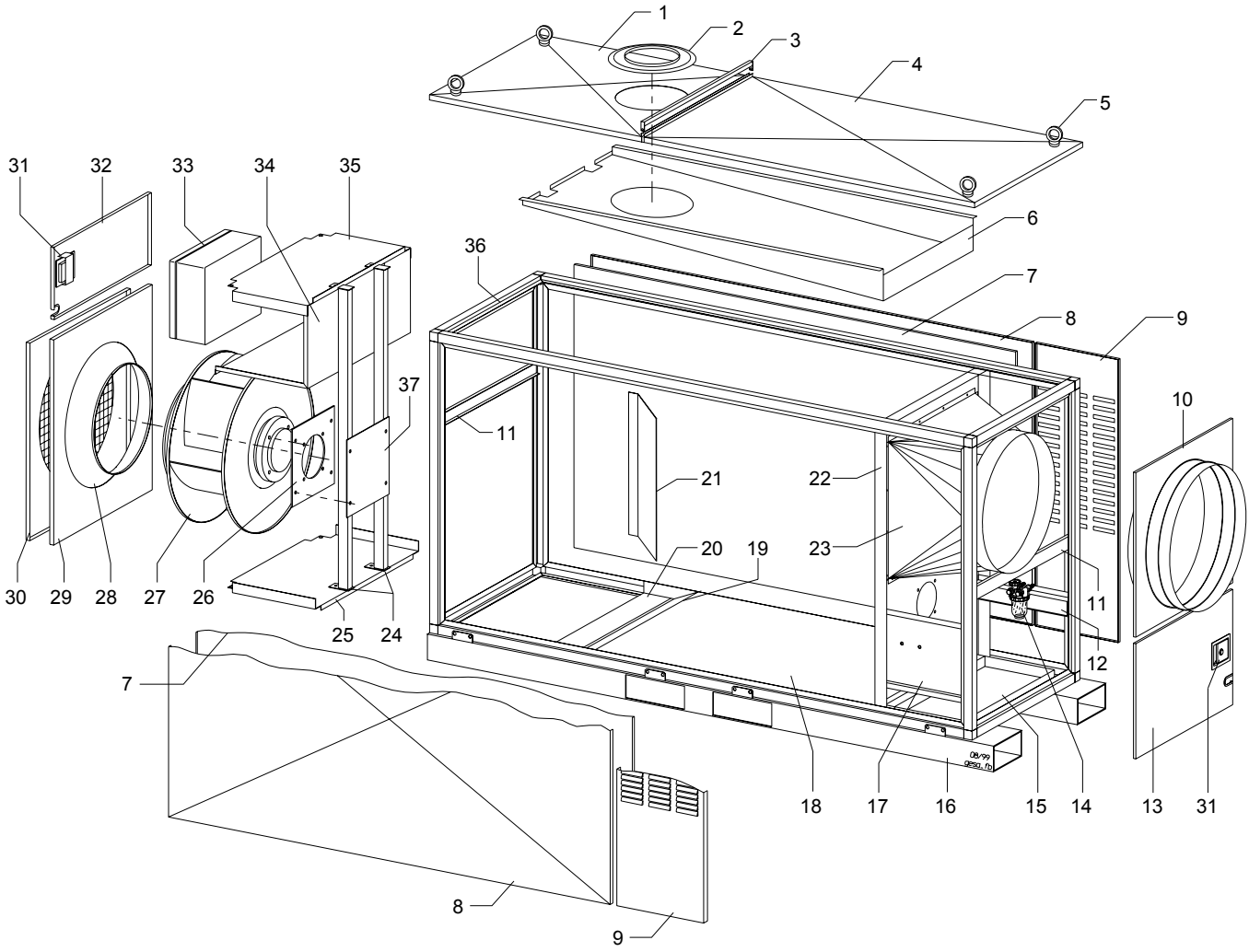
More air Level 2:

Set the **orange** adjustment lever clockwise to the larger opening angle. When operating at Level 2, the speed of the adjustment motor adjusts automatically.

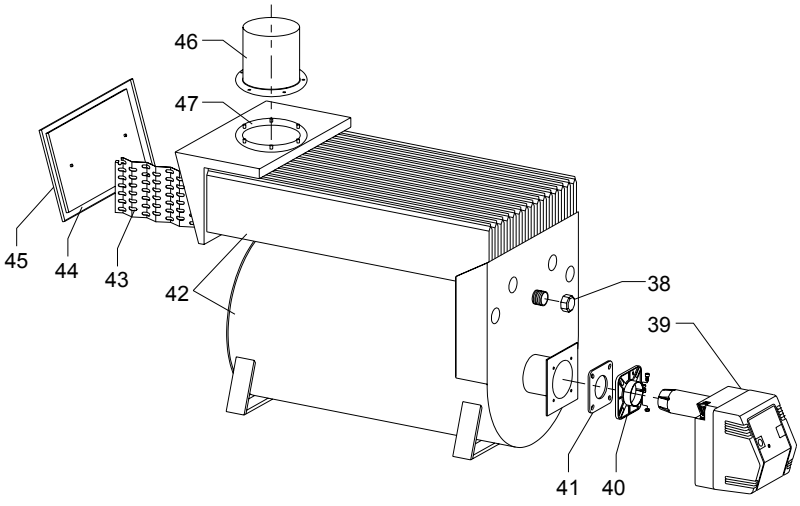
Make sure that there are no mechanical defects on the adjustment motor or the air flap otherwise the adjustment motor will be damaged.

Exploded View

Unit housing



Combustion chamber with heat-exchanger

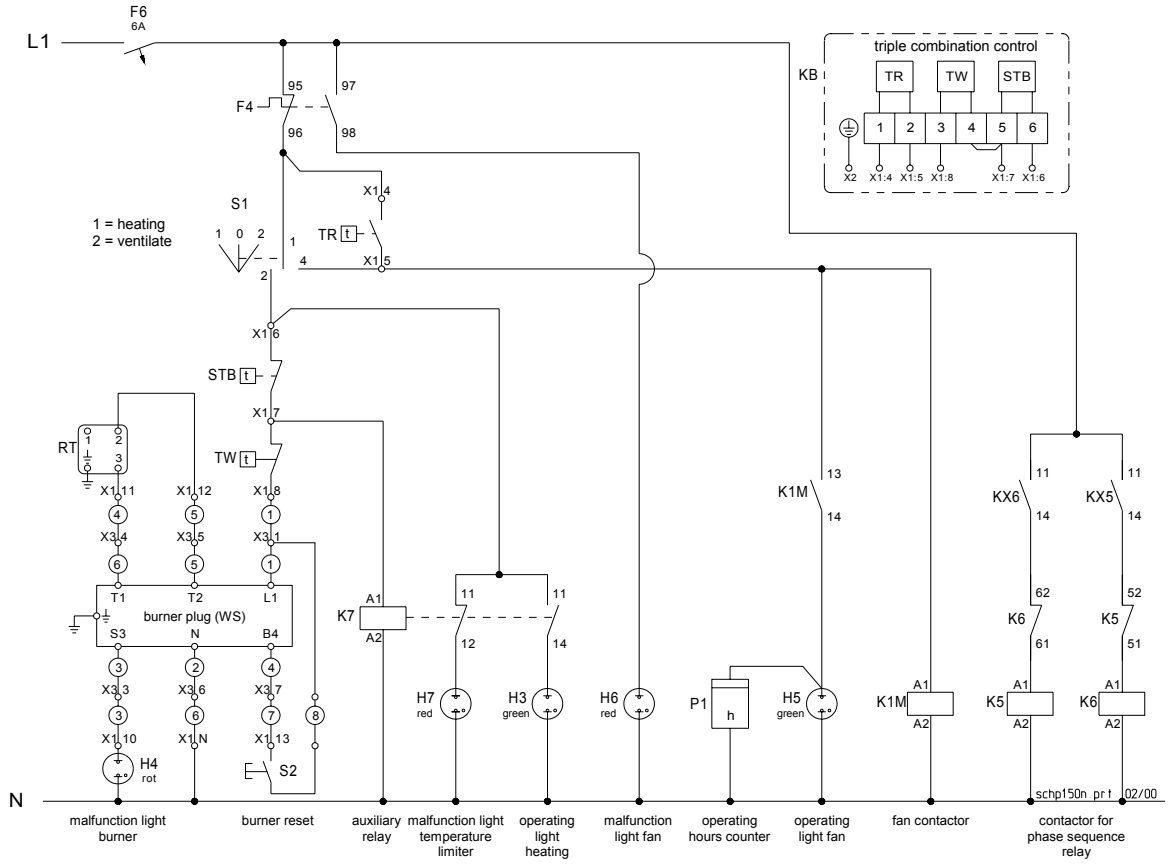


We reserve the right to make changes to dimensions and design in the interest of technical progress.

Spare Part List

No.	Description	HTL 150 FB Ref. No.	HTL 200 FB Ref. No.	HTL 250 FB Ref. No.
1	Cover plate, rear	1105335	1105335	1105335
2	Rosette for exhaust gas connection	1103023	1103023	1103023
3	Connecting profile	1105312	1105312	1105312
4	Cover plate, front	1105336	1105336	1105336
5	Crane lug	1102554	1102554	1102554
6	Insulation, top	1105412	1105412	1105412
7	Insulation, left/right	1105413	1105413	1105413
8	Lining plate, side, rear (left/right)	1105339	1105339	1105339
9	Lining plate, side, front (left/right)	1105411	1105411	1105411
10	Air outlet pipe	1105341	1105341	1105341
11	Assembly rail front/rear	1105414	1105414	1105414
12	Assembly plate for oil filter	1105342	1105342	1105342
13	Lock door burner	1105382	1105382	1105382
14	Oil filter with shut-off valve	1102526	1102526	1102526
15	Oil collector	1105344	1105344	1105344
16	Substructure	1105345	1105345	1105345
17	Assembly plate, electrical	1105346	1105346	1105346
18	Insulation, bottom	1105347	1105347	1105347
19	Air baffle (in front of base plate)	1105385	1105385	1105385
20	Base plate	1105386	1105386	1105386
21	Air baffle (left/right)	1105387	1105387	1105387
22	Buffer wall, front	1105352	1105352	1105352
23	Multi-connection adapter	1103029	1103029	1103029
24	Fan mount	1105388	1105388	1105388
25	Insulation bottom, rear	1105389	1105389	1105389
26	Fan console	1105390	1105391	1105391
27	Fan	1105375	1105377	1105380
28	Start up nozzle	1105376	1105378	1105378
29	Air intake plate	1105392	1105393	1105393
30	Lining plate, rear (with grille)	1105394	1105395	1105395
31	Latch incl. lock	1105302	1105302	1105302
32	Lock door electrical	1105398	1105398	1105398
33	Control box, cpl.	1105396	1105397	1105397
34	Assembly plate for control box	1105399	1105399	1105399
35	Insulation top, rear	1105401	1105401	1105401
36	Unit frame, cpl.	1105402	1105402	1105402
37	Insulation fan	1105403	1105403	1105403
38	Lock cap	1103032	1103032	1103032
39	Forced-air oil burner, cpl.	948010	948510	948510
40	Burner flange	1108539	1108539	1108539
41	Flange seal	1108538	1108538	1108538
42	Combustion chamber with heat-exchanger, cpl.	1103054	1103055	1105381
43	Flue gas brakes, set	1105404	1105405	1105405
44	Seal for inspection cover	1105406	1105406	1105406
45	Inspection cover	1105407	1105407	1105407
46	Exhaust gas connection	1105360	1105360	1105360
47	Seal exhaust gas connection	1103020	1103020	1103020
not shown				
	Oil preheater	1105301	1105301	1105301
	Triple combination control	1102562	1102562	1102562
	Connection cable with plug	1105362	1105362	1105362
	Thermostat socket, angle	1102048	1102048	1102048
	Shunt plug	1101019	1101019	1101019
	Double power socket	1105408	1105408	1105408
	Distribution box	1105409	1105409	1105409
	Thermostat plug (accessory)	1101020	1101020	1101020

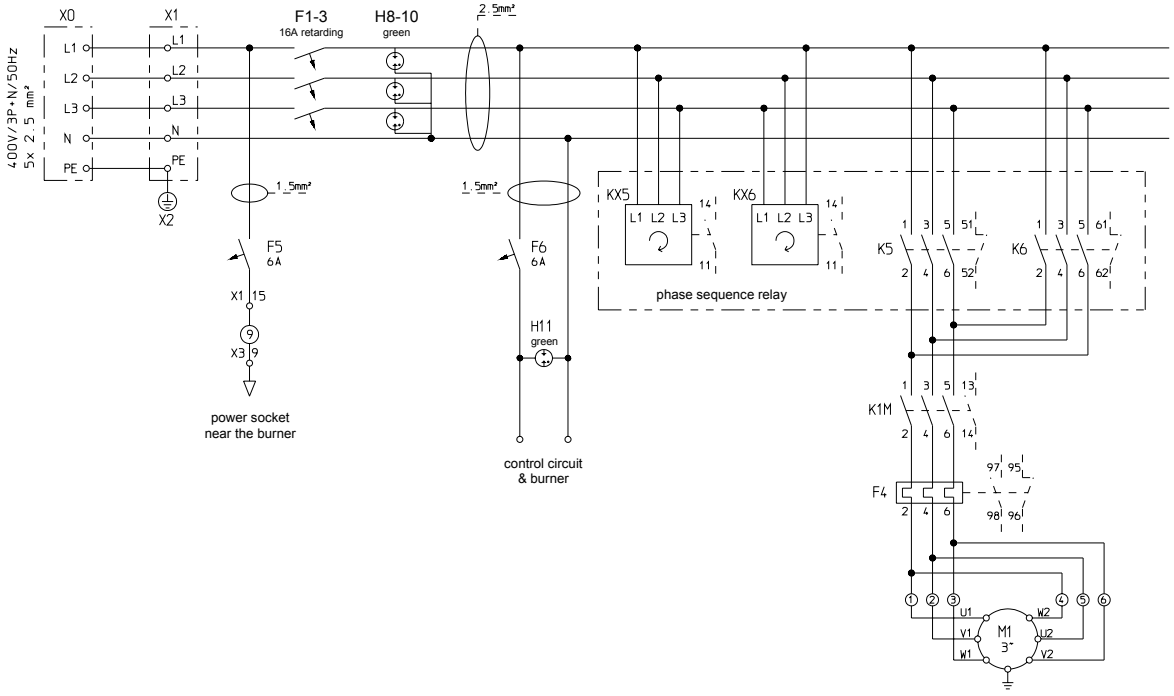
Wiring Diagram HTL 150 FB



F1-3 = Power fuses
F4 = Motor protection switch
F5 = Back-up fuse (plug)
F6 = Control fuse
H3 = Operating light (heating)
H4 = Malfunction light (burner)
H5 = Operating light (fan)
H6 = Malfunction light (fan)
H7 = Malfunction light (temperature limiter)

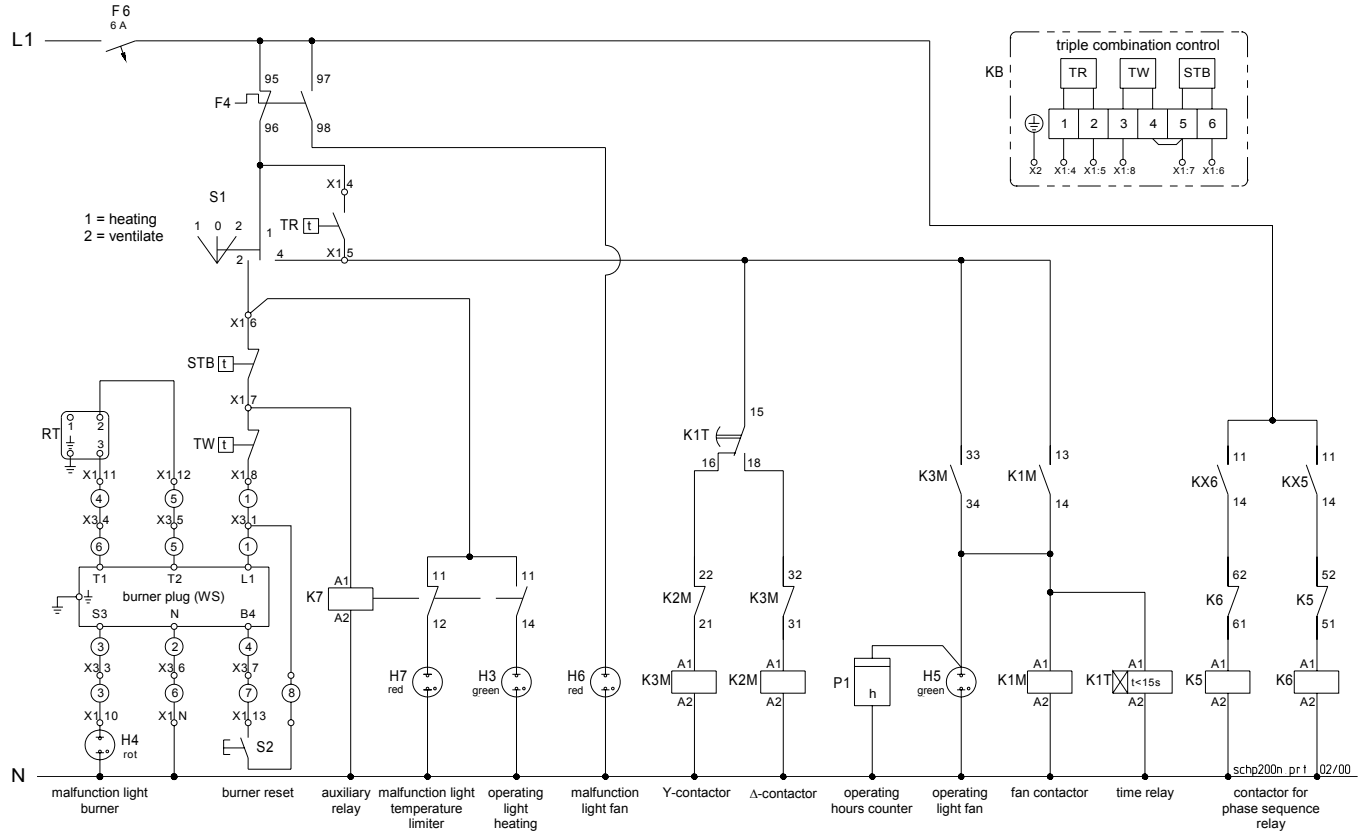
H8-10 = Control lights (phases)
H11 = Control light (control phase)
K1M = Fan contactor
K5-6 = Contactor for phase sequence relay
K7 = Auxiliary relay
KX5-6 = Phase sequence relay
KB = triple combination control
M1 = Fan motor
P1 = Operating hours counter
RT = Room thermostat socket

S1 = Operating switch
S2 = Burner reset
STB = Safety temperature limiter
TR = Temperature control thermostat
TW = Temperature monitor
X0 = Connection cable with 16A plug
X1 = Terminal strip in control box
X2 = Terminal strip PE
X3 = Terminal strip in terminal box (front)



We reserve the right to make changes to dimensions and design in the interest of technical progress.

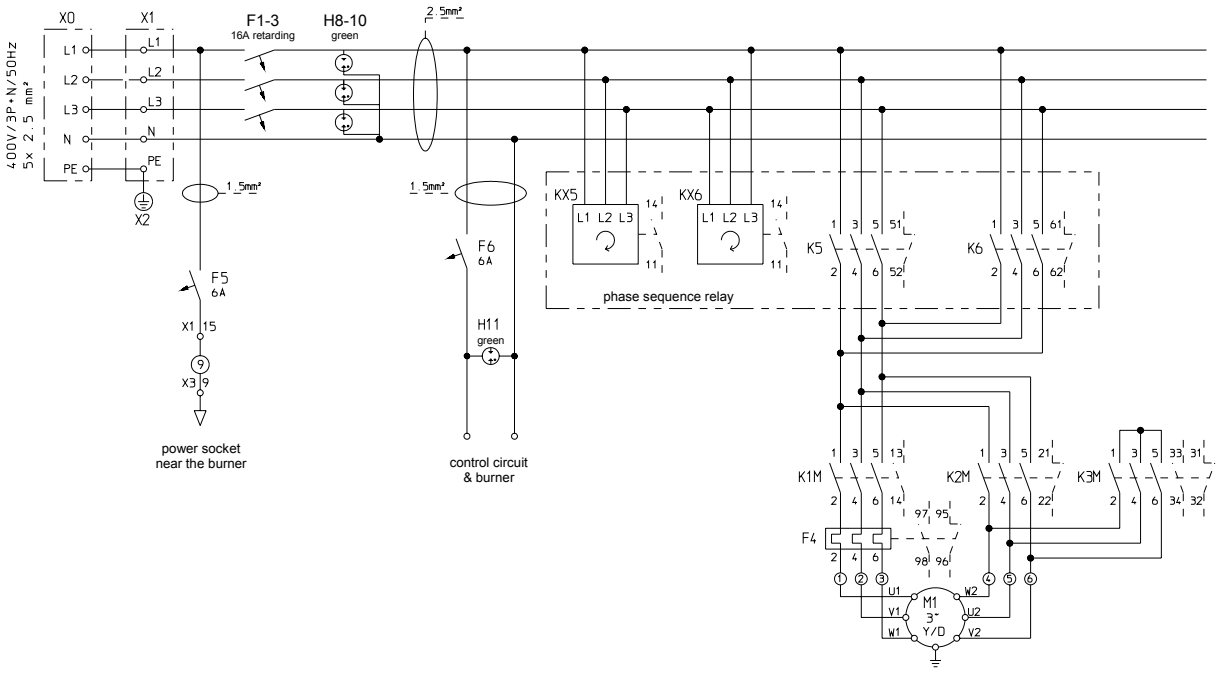
Wiring Diagram HTL 200/250 FB



F1-3 = Power fuses
F4 = Motor protection switch
F5 = Back-up fuse (plug)
F6 = Control fuse
H3 = Operating light (heating)
H4 = Malfunction light (burner)
H5 = Operating light (fan)
H6 = Malfunction light (fan)
H7 = Malfunction light (temp.limiter)
H8-10 = Control lights (phases)
H11 = Control light (control phase)

K1M = Fan contractor
K2M = Δ-contactor
K3M = Y-contactor
K1T = Time relay
K5-6 = Contactor for phase sequence relay
K7 = Auxiliary relay
KX5-6 = Phase sequence relay
KB = 3-speed combination regulator
P1 = Operating hours counter
M1 = Fan motor
RT = Room thermostat socket

S1 = Operating switch
S2 = Burner reset
STB = Safety temperature limiter
TR = Temperature control thermostat
TW = Temperature monitor
X0 = Connection cable with 16A plug
X1 = Terminal strip in control box
X2 = Terminal strip PE
X3 = Terminal strip in terminal box (front)



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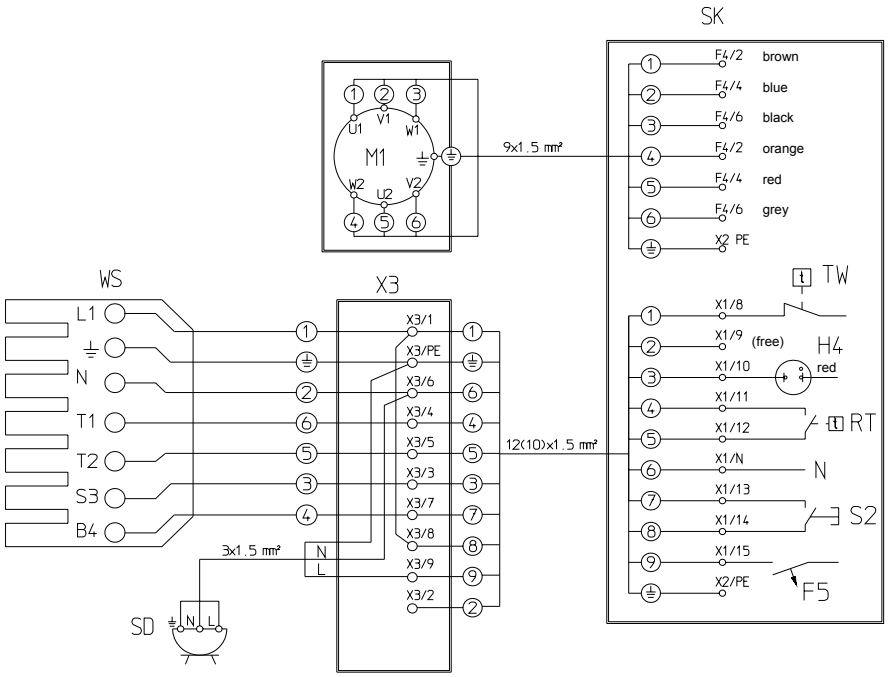
Wiring Diagram HTL FB



F5 = Back-up fuse power socket
H4 = Malfunction light burner
M1 = Fan motor
RT = Room thermostat socket
SD = Double power socket in front
S2 = Burner reset
SK = Control box
TW = Temperature monitor
WS = Wieland plug to the burner
X3 = Terminal box front

Technical Data

Model		HTL 150 FB	HTL 200 FB	HTL 250 FB
Rated heat power max,	kW	160	200	220
Rated heat output	kW	148	184	203
Rated air output [1]	m³/h	11,180	12,950	13,860
Pressure (max. total)	Pa	410	540	620
Fuel		heating oil EL according to DIN 51603 or diesel		
Fuel consumption max.	kg/h	13.5	16.8	18.0
Oil nozzle	USG	3.0 80°S	3.5 80°S	4.0 80°S
Pump pressure	bar	14	16	14.5
Exhaust gas emissions min,	%	8	8	9
Furnace resistance (in operating mode)	Pa	65	110	135
Required chimney draught	Pa	0	0	0
Electrical connection	V/Hz	400/3N~ / 50	400/3N~ / 50	400/3N~ / 50
Power consumption (max, total unit)	W	2,640	4,580	4,810
Rated current (max. total unit)	A	6.1	9.3	9.8
Power consumption (max. fan)	W	1,950	3,900	4,100
Rated current (max. fan)	A	3.6	6.8	7.1
Power consumption (fuel pre-heating)	W	300	300	300
Fuse protection (customer-installed)	A	3 x 16	3 x 16	3 x 16
Temperature increase (Δ_t)	K	56	57	59
Sound pressure level L_{pA} 1m [2]	dB (A)	71	74	74
Air intake ø (air intake connection, accessory)	mm	550	550	600
Air outlet ø	mm	550	550	550
Exhaust gas connection ø	mm	200	200	200
Length total	mm	2,400	2,400	2,400
Width total	mm	800	800	800
Height total	mm	1,370	1,370	1,370
Weight (with forced-air oil burner)	kg	460	480	505

1) (at Δ_t 45K / 1.2 kg/m³)
2) Noise measuring DIN 45635 - 01 - KL 3

We reserve the right to make changes to dimensions and design in the interest of technical progress.

Maintenance Log

Model: **: .....** **Model No.:** **: .....**

Burner **: .....** **Burner No.:** **: .....**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Clean unit -surface-																				
Clean unit -interior-																				
Clean fan																				
Clean combustion chamber																				
Clean heat exchanger																				
Clean/replace exhaust gas suppressor																				
Replace seals -inspection cover-																				
Replace seals –burner-																				
Clean/replace filter -fuel-																				
Check safety mechanisms																				
Electric safety inspections																				
Check protective mechanisms																				
Check unit for damage																				
Maintenance –burner-*)																				
Test run																				

Comments:.....

.....

1. Date :…… …… Signature	2. Date : .... Signature	3. Date : .... Signature	4. Date : .... Signature	5. Date :…… …… Signature
6. Date :…… …… Signature	7. Date : .... Signature	8. Date : .... Signature	9. Date : .... Signature	10. Date :…… …… Signature
11. Date :…… …… Signature	12. Date : .... Signature	13. Date : .... Signature	14. Date : .... Signature	15. Date :…… …… Signature
16. Date :…… …… Signature	17. Date : .... Signature	18. Date : .... Signature	19. Date : .... Signature	20. Date :…… …… Signature

***) Maintenance work may only be performed on the forced-air oil burner by authorised personnel; settings must comply with legal specifications. A corresponding test log must be kept.**

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