

■ Operating and installation instructions

REMKO HTL-EC series **Oil heating systems**

HTL 200-EC, HTL 250-EC



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Carefully read this operating manual prior to commissioning/using the units!

This operating manual is a translation of the German original.

This manual is an integral part of the unit and must always be kept in the vicinity of the installation location or on the unit itself.

Subject to modifications; no liability accepted for errors or misprints!

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Safety notes

As a matter of principle, always observe the respective local building code and fire prevention guidelines as well as the guidelines of the accident prevention and insurance associations when using the unit.

- The units may only be operated by persons that have been instructed in their operation
- The units must be installed and operated in such a way that personnel are not endangered by exhaust, warm air and radiant heat and no fires can occur
- The units must be installed in a stable position.
- The units must then only be operated in areas where the units can be supplied with an adequate amount of air for the combustion
- If the units are being operated without exhaust gas routing then they may only be operated in well-ventilated areas. Under such circumstances it is forbidden for personnel to remain in these areas for extended periods. Appropriate prohibition signs should be put up at the entrances
- A safety zone of 1.5 m should be maintained around the units - incl. non-combustible items
- The units may only be installed on a level and non-combustible surface
- The units must not be installed or operated in potentially flammable or explosive environments
- All electrical cables for the units must be protected against damage (e.g. by animals etc.)
- The units must not be exposed to direct jets of water e.g. pressure washers etc.
- Portable fuel containers may only be installed if they comply with the technical rules for combustible liquids "TRbF 210 and 280"
- The protective grid of the unit's intake must always be kept free of dirt and loose objects
- Never insert foreign objects into the units
- The power plug must be pulled out of the mains socket before the start of work on the unit as a matter of principle
- Safety devices must not be bypassed or disabled
- The personnel tasked with operating the units must check the units for visible defects on the operating and safety devices as well as the presence of the protective devices at the start of work. If defects are discovered these must be reported to the supervisor
- In the case of defects that endanger the operational safety of the unit, it must be taken out of service immediately
- The units should be checked as required in accordance with the operating conditions. However, they must be checked at least once a year by a specialist to ensure that they are in a condition that is safe to use. The exhaust gas values for the burners must be checked
- The units may only be operated for room heating with a room thermostat (accessory)

ATTENTION

The units must only be installed in well ventilated spaces and not in living areas or similar recreational areas.

NOTE

The units are not designed for use as a fixed installation.

CAUTION

The units may never be disconnected from the mains prior to the completion of the follow-up cooling phase (except in emergencies).

NOTE

Only type-approved forced-air oil burners in WLE design per DIN 4787 and DIN EN 267 should be used.

NOTE

For optimum operation the units should not be operated above an ambient temperature of 25 °C.

Unit description

The units are portable, directly fuelled 2-stage fan-assisted heaters (WLE) with a heat exchanger and an exhaust gas connection exclusively for commercial applications.

The units are fuelled directly with EL heating oil or Diesel fuel.

The units are fuelled by a separate 2-stage forced-air oil burner and a 2-stage supply air fan and are also suitable for temporary outdoor installation.

The units are equipped with a large-volume fuel pre-heater (300 W) as standard.

All components have been fitted behind a lockable door to protect them against the effects of weather and unauthorised operation.

The units are equipped with a noise-optimised and low-maintenance high-performance special-purpose fan and fitted switching and control devices.

The units have been designed for 2-stage operation as standard and have a number of useful optical indicators on the control cabinet.

The units consist of a stable frame structure supported by robust stainless steel transport runners.

The units conform to the fundamental health and safety requirements of the appropriate EU stipulations and are simple to operate.

Operating sequence

If the units are set to heating mode 1 or 2 then the forced-air burner starts automatically.

After the burner has run for 1 minute the supply air fan switches on. Warm air is blown out.

The temperature monitor "TW" monitors the internal temperature of the unit.

When operating with a room thermostat this process is repeated automatically depending on the heat demand.

After switching off the units via the operating switch or the room thermostats the supply air fan runs to cool the combustion chamber with the heat exchanger for a certain time and then switches off. This process may be repeated several times.

Locations at which units are used

As mobile, directly fuelled fan-assisted heaters, the units deliver instant heat. They are designed exclusively for heating and ventilation purposes in a commercial setting.

The units may be used for the heating, temperature adjustment or drying of:

- Warehouses
- Exhibition halls
- Trade fairs
- Lightweight construction halls
- Large tents/marquees
- Large construction sites

Installation instructions

The safety regulations of the accident prevention and insurance associations, the respective regional building regulations and the combustion appliances regulations apply to operation of the units.

- The units may only be installed and operated in areas where the units can be supplied with an adequate amount of air for the combustion and the exhaust gases can be routed to the outside via exhaust gas ducting. There is enough natural air supply for the combustion if, for example, the space in m³ is at least 10 times the nominal heating capacity in kW of all of the units operating in the space and if the natural circulation of air is guaranteed by windows and doors.

NOTE

Overpressure and underpressure in the installation area should be avoided as this will inevitably lead to combustion-related faults.

- Ensure that there is an adequate fresh air supply appropriate to the respective forced-air burner capacity (see name plate). The forced-air oil burner may need to be fitted with a separate air supply for combustion
- The fresh air supply required for trouble-free combustion must be ensured. It is practical to have the fresh air supply provided by windows and doors or through appropriately dimensioned openings in the outside wall

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Unit installation

- The units may be operated in a space without exhaust gas ducting if this is well ventilated (both incoming and outgoing air) and the proportion of health endangering substances in the breathing air does not reach a detrimental concentration. Good natural ventilation and exhaust extraction is provided, if for example, the room volume in m³ is at least 30 times the nominal heating capacity of all of the units operating in the space and if the natural exchange of air is guaranteed by windows and doors or there are non-closable openings for incoming and outgoing air in the vicinity of the ceiling and floor whose size in m² is at least 0.003 times the nominal heating capacity of all of the units operating in the space.
It is forbidden for personnel to remain in these areas for extended periods. Appropriate prohibition signs should be put up at the entrances.

Safety distances

- In order to guarantee safe operation and maintenance of the units, 1.5 m safety distance should be maintained around the unit
- Flooring and ceilings must be fire retardant
- Intake and outlet diameters must not be narrowed or blocked with foreign objects

When installing the units, the local and country-specific regulations (LBO) and combustion plant order (FeuVO) of the respective state must be observed.

When determining the installation location indoors or outdoors, the requirements must be coordinated in regard to:

- Fire protection and operational hazard
- Adherence to appropriate safety distances
- The function
Space heating, free air delivery or duct system, underpressure and overpressure possible at the place of installation!
- General concerns
Heat requirements, room temperature, nominal flow rate, air distribution, air circulation or fresh air requirements and spatial requirements
- Exhaust gas ducting
- Installation, repair and maintenance possibilities

- Indoor installation
Ratio of spatial volume to nominal heating capacity particularly in regard to naturally ventilated spaces!
- Ordinance for implementation of Federal Emissions Control Regulations (BImSchG) and the subsequently issued legislation (ENEG)

Installation

- Both indoors and outdoors, the units must be installed stably on a level, load-bearing and non-flammable surface and away from traffic zones e.g. away from the operating areas of cranes
- If the substrate is soft, suitable substructures such as square timbers must be installed under the transport runners
- The units must be installed and operated in such a way that personnel are not endangered by exhaust gases and radiant heat and no fires can occur
- The units must be installed in such a way that they do not present a hazard or unreasonable inconveniences.
Vibration, oscillation or noises



ATTENTION

Before carrying out any work, ensure that the unit is installed horizontally and that it is in a de-energised state.

- The units must be set up and installed in such a way that they are easily accessible for repair and maintenance work
- Control elements that could cause dangerous operational states if used incorrectly must be protected against unauthorised actuation
- The units must not be installed or operated in potentially flammable or explosive environments or areas

Exhaust gas ducting

It is also possible to operate the units outdoors or in open halls without special-purpose exhaust ducting.

To protect individuals against inconvenience and to prevent precipitation from penetrating the combustion chamber, a 1 m exhaust pipe with an integrated rain hood (accessory) should always be fitted to allow for safe removal of exhaust gases.

If the unit is installed indoors (enclosed halls), exhaust ducting must be fitted in accordance with the applicable regulations.



NOTE

In order to avoid the combustion chamber being damaged due to moisture (condensate) from the exhaust ducting, make sure that the exhaust system is correctly installed with a condensate trap.

Outdoor installation

- Operation of the units must not present a hazard or unreasonable discomfort
- The unit operator must ensure that it is not possible for unauthorised persons to manipulate either the unit or the power supply
- Precipitation such as rain or snow can be sucked in through the supply air fan. For this reason suitable weather protection should be provided

Fuel supply

An adequate fuel supply that makes use of suitable and approved safety tanks and suitable pipelines must be provided by the customer.

The suction line in the base of the tank must be fitted with a foot valve as a matter of principle. It must also be ensured that the line cross-section is suitable for the total line resistance, the suction height and increased viscosity at low oil temperatures.

Under certain circumstances, it may be necessary to use an oil feed unit.

The respective local regulations and the TRbF 20 regulations must be adhered to at all times.

Even at low temperatures, an adequate supply of flowing heating oil must be ensured.

- The factory-fitted oil pre-heating system is only active if the unit is connected to a functional mains socket and the ambient temperature is lower than 10°C
- It is not possible to rectify paraffin separation that has already occurred using the pre-heating system. If paraffin has already formed it is necessary to clean out the complete fuel system



NOTE

Paraffin formation can start at temperatures below 5°C. To avoid this appropriate preventative measures must be implemented, e.g. winter Diesel.

Electrical connection

- The units are operated with 400/3N~/50 Hz three-phase current
- The electrical connection is made using a built-in mains cable with a 16A CEE plug



- The mains cable must be selected based on the connection power of the unit and the cable length while also taking the local circumstances into account
- Cable extensions must be suitable for the application and may only be used in fully unreeled or reeled off condition



NOTE

The electrical connection for the units must be made at a separate feed point with a residual current device in accordance with VDE 0100, Section 55.



ATTENTION

All cable extensions must only be used in fully un-reeled or reeled off condition.



ATTENTION

Work on the electrical installation must be performed exclusively by authorised specialists for safety reasons.

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Distribution of warm air

The units are equipped with a special-purpose high-performance fan. This fan is designed to specifically and effectively transport the heated air as per the respective requirements.

The distribution of the air is preferably implemented via ducting or special warm air or membrane hoses.

The possible lengths depend on the air-side resistances of the air ducts used.

NOTE

The hot air hoses must only be used in fully extended form and without any constrictions.

It is essential that the following points be observed if warm air hoses are used:

- Only ever use warm air hoses (accessory) that have been approved by us
- The inner overlapping on the seams of the warm air hoses must point in the direction of the air flow
- It is necessary to ensure that the pipes or hoses are fastened securely to the unit outlet nozzle
- There should be no kinks or bends in the hose lines in order to prevent hot-spots forming
- Ideally, spiral ducts should be used

- Whenever possible, only warm air or membrane hoses should be used for straight air ducts
- Membrane hoses must not be twisted
- Heating enclosed spaces by way of hot air ducting must not lead to excessive overpressure
- The forced-air oil burner can be switched off briefly during operation by the temperature monitor (TW) in the event of increased intake temperatures or resistance at the unit's outlet
After the temperature drops again the burner restarts automatically!

- If the cycle intervals are too short the length and layout of the hot air ducting should be checked

NOTE

Cycled operation of the forced-air oil burner with run times under 5 min. should certainly be avoided.

NOTE

If a build-up of heat should occur then the heating operation will be interrupted by the STB permanently!

NOTE

The maximum air intake temperature of 30 °C must not be exceeded.

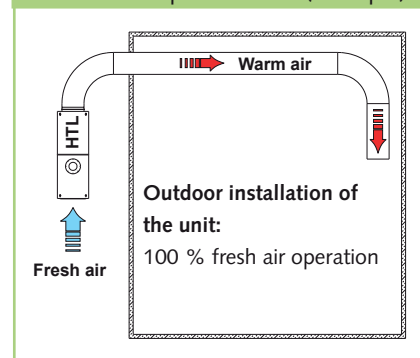
Modes of operation

The units can be used for fresh air, air recirculation or mixed air operation.

Fresh air operation

The air intake is implemented at the factory on the rear side of the unit.

Schematic representation (example)



Recirculation operation

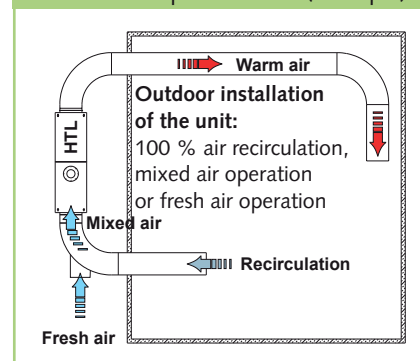
To use the unit exclusively for air recirculation, a pipe nozzle (accessory) must be fitted on the air intake side.

NOTE

Air feeds on the intake side must always be implemented by means of non-distorting hoses/ducts (no unstable hoses).

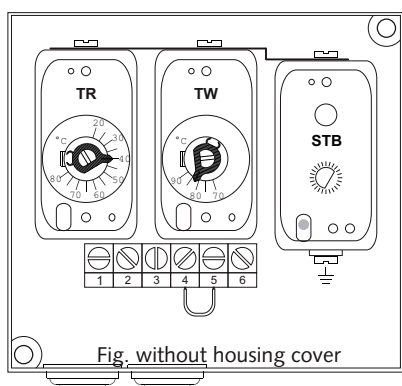
Ideally, a spiral duct or something similar should be used for the air circulation intake if the unit is installed outdoors.

Schematic representation (example)



Safety equipment

Triple-function combination controller



NOTE

The triple-function combination controller is located inside the control cabinet.

The units have the following control or safety equipment:

Temperature controller (TR)

The temperature controller determines when the recirculating fan is switched off.
Setpoint approx. 40 °

Temperature monitor (TW)

The temperature monitor limits the unit or outlet temperature in heating mode via the burner.
Setpoint approx. 80 - 85 °C.

Safety temperature limiter (STB)

The safety temperature limiter (STB) interrupts the heating function in case of extreme overheating or a failure or malfunction of the TW. The red fault indicator light "Overheating" on the control cabinet illuminates.

ATTENTION

Safety devices must not be bypassed or disabled.

The STB is unlocked by pressing the "Overheating" reset key on the control cabinet. This is only possible once the unit has cooled down.

ATTENTION

It is essential to identify the potential reasons why the STB was triggered before releasing the STB for recommissioning.

The supply air fan is monitored by an integrated, active temperature management system. Unit operation is interrupted if the motor is overloaded or in the event of a phase failure

Automatic circuit breakers provide all of the electrical components with additional protection. These can only be disconnected once the control cabinet is opened.

NOTE

The unit must be disconnected from the mains power supply before opening the control cabinet.

WLE-type automatic burners

The unit is permanently switched off by the automatic burner through the optical flame monitoring in the event of irregularities in the combustion, the flame extinguishing, fuel deficiencies etc. Manual resetting is required.

NOTE

Only type-approved forced-air oil burners in WLE design per DIN EN 230 and DIN EN 267 should be used.

Regulating devices

The temperature sensor of the controller is self-monitoring. The probes are cold-resistant down to -20 °C.  At temperatures below -20 °C the controller current flow will be interrupted - if the temperature rises above -20 °C the current flow will be released again. In the event of the probe or the capillary tube being damaged, as well as if an overtemperature of ca. 220 °C is reached, the filling medium will be emptied and the safety device is permanently triggered. Resetting is no longer possible. The controller is no longer fully functional and must be replaced.

Only use "**REMKO original replacement parts**" when replacing safety devices.

- Ensure that the device is fitted properly
- The capillary tubes on the triple-function combination controller must not be kinked or bent in the immediate vicinity of the soldering points
- The probes must only be fitted at the fastening points provided by the factory
- The probes must always be free of dust and dirt in order to be sure of their correct functioning

ATTENTION

After working on the safety equipment, it is essential that this be checked to ensure that it is functioning correctly.

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Commissioning

One person, who has been adequately trained in the handling of the units, should be tasked with the operation and monitoring of the units.

NOTE

After fulfilling the respective local regulations as well as a professional installation of the unit, the exhaust values for the forced-air burner must be checked and adjusted if necessary by authorised specialists.

Starting the unit

1. Open the lockable door on the rear side of the unit.

2. Check that the operating switch has been moved to the "0" (Off) position.



3. Place the room thermostat at a suitable location.

The thermostat probe must not be positioned in the warm air flow and must not be placed directly on a cool substrate.

4. Connect the room thermostat to the thermostat socket on the control cabinet.

5. Set the desired room temperature on the room thermostat.

The temperature set must be higher than the current room temperature.

6. Connect the unit to a properly installed and fused mains socket.

7. Check that the green indicator lights for the grid phase and the control phase are illuminated on the control cabinet.

10

8. Open all of the fuel supply shut-off devices.
9. Move the operating switch on the control cabinet to the "1" (Heating) position.
10. If heat is required, the forced-air oil burner is switched on immediately. The supply air fan is switched on after a time delay of 1 minute.
11. Close the rear lockable door.
12. The lockable door should be closed at all times to prevent the unit from being operated by unauthorised personnel.

Operation

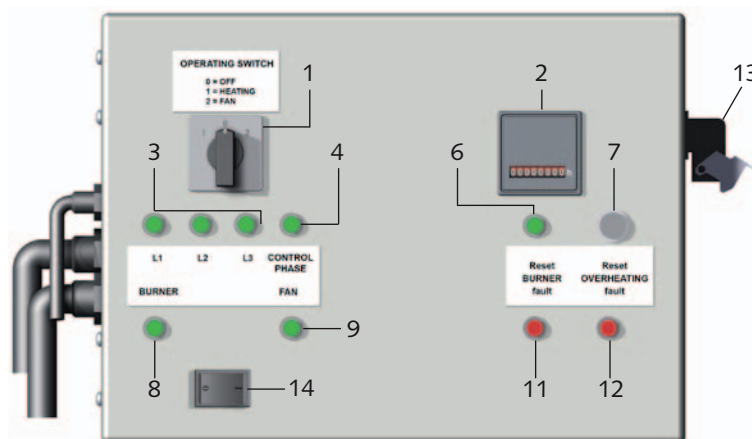
The unit operates in a fully automatic manner subject to the pre-selected room temperature and power stage.

The burner can be switched off briefly during operation by the temperature monitor (TW) in the event of increased intake temperatures or resistance at the unit's outlet.

After the temperature drops again the burner restarts automatically. Avoid restarting the burner on a frequent basis during unit operation.

In the event of an excessive and lasting increase in temperature at the outlet, the heating operation will be interrupted by the STB permanently!

Control panel on the control cabinet



- | | |
|--|--|
| 1 = Mode selector switch | 9 = Indicator light -GREEN- "Fan operation" |
| 2 = Operating hours counter | 11 = Indicator light -RED- "Burner fault" |
| 3 = Indicator lights -grid phase- | 12 = Indicator light -RED- "Overheating" (STB) |
| 4 = Indicator light -GREEN- "Control phase" | 13 = Thermostat receptacle |
| 6 = Reset "Burner fault" | 14 = Heating stage switch, 0 = 1st stage/1 = 2nd stage |
| 7 = Reset "Overheating" (STB) | |
| 8 = Indicator light -GREEN- "Burner operation" | |

Care and maintenance

Fan

In this operating mode, the supply air fan runs permanently. The units can be used for air recirculation or ventilation purposes.

1. Move the operating switch on the control cabinet to the "2" (Fan) position.

Thermostatic regulation and heating operation are not possible in this operating mode.

Shutdown

1. Move the operating switch to the "0" (Off) position.



2. Shut off fuel supply.

3. In the event of long periods of inactivity, disconnect the unit from the mains power supply.



The supply air fan runs on to cool the combustion chamber and the heat exchanger and only switches off after the cooling down phase is complete.

The fan can switch on and run several times before the final shutdown.

ATTENTION

Never interrupt the power supply prior to the completion of the follow-up cooling phase. There is no guarantee entitlement in case of damage to the units due to overheating.

Regular care and observation of some basic points will ensure trouble-free operation and a long service life.

ATTENTION

Before undertaking any work on the unit, the unit must be completely disconnected from the power supply and secured to prevent unauthorised start-up.

NOTE

Adjustment and maintenance work may only be carried out by authorised and qualified technicians.

- Keep the units free of dust and other deposits

- Only clean the units with a dry or moistened cloth

- Never subject to direct jets of water **e.g. pressure washers etc.**

- Check the units for mechanical damage and have defective parts replaced if necessary

- Never use abrasive or solvent-based cleaners

- Use only suitable cleaners, even for heavy contamination

- It must be ensured that the exhaust air ducting and combustion air ducting are fully functional at all times

- Use only clean EL heating oil or diesel fuel

Beware of paraffin formation!

- Check the fuel filter(s) for contamination at regular intervals. Replace contaminated filter if necessary

- Check the units for mechanical damage and have defective parts properly replaced

- Check the fan wheel and combustion chamber with heat exchanger for contamination at regular intervals and clean these if necessary

- Check the on-site oil tanks regularly for contamination and foreign bodies and clean these if necessary

- Check that the safety devices are operating correctly at regular intervals

- Keep the probes for the safety devices free of dust and dirt

- Have the exhaust gas values for the forced-air burner checked by authorised specialists at regular intervals

- Adhere to maintenance and care intervals

- Store the unit in a dry and dust-free location when it is not in use

NOTE

For safety reasons we recommend that you enter into a maintenance contract.

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Cleaning tasks

The entire unit, including the heat exchanger, combustion chamber and forced-air oil burner must be cleared of dust and dirt after every heating period, or possibly earlier depending on the operating conditions.

Wearing parts, such as exhaust gas suppressors, seals, oil filter inserts and oil nozzles for example, should be checked and replaced if necessary.

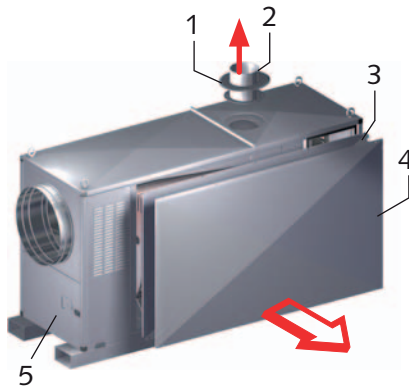
Removing the combustion chamber

For cleaning purposes, it is necessary to remove the entire combustion chamber and heat exchanger.

1. Move the operating switch to the "0" (Off) position.

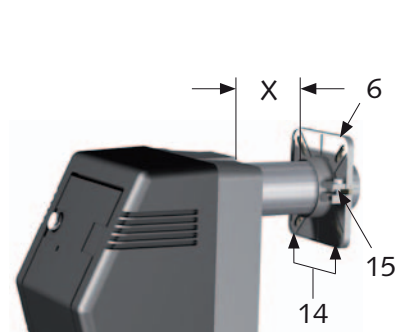


2. Remove the power plug from the mains socket.



3. Remove the collar [1] from the exhaust gas nozzle.
4. Remove all of the upper cover panels on the housing
5. Remove the exhaust gas nozzle [2] from the exhaust gas collector and pull it upwards and out.

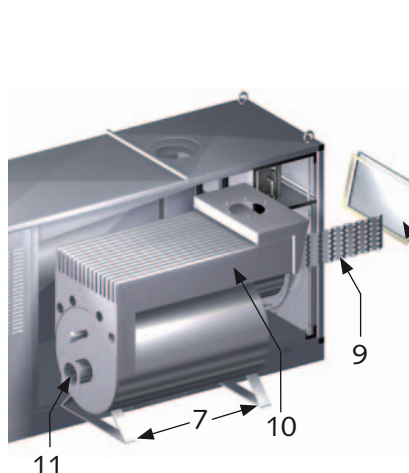
6. Remove the lateral casing panel [4] and the insulation [3].
7. Open the lockable door at the front [5].
8. Undo the 2 lower fastening screws [14] on the burner flange [6].
9. Undo the clamping screw [15] on the burner flange [6], lift the burner slightly and pull it out to the rear.



10. Remove the burner flange [6] from the unit in its entirety. Take care not to damage the flange seals.

Damaged flange seals can result in incorrect air induction.

11. Remove all fastening screws from the combustion chamber supports [7].
12. Remove the combustion chamber from the housing sideways.



Cleaning the heat exchanger and combustion chamber

1. Remove the inspection cover [8].
2. Remove the exhaust gas suppressors [9], clean them and replace any that are defective.
3. Clean all exhaust gas passes [10].
A special-purpose cleaning brush is available as an accessory.
4. Check the seals of the inspection cover [8] and replace any that are defective.
5. Clean the combustion chamber through the burner opening [11] with a vacuum cleaner.
A special-purpose boiler cleaning set for the REMKO industrial vacuum cleaner is available as an accessory.

Assembly and installation

1. Assemble the dismantled parts by reversing the removal procedure.
2. When fitting the inspection cover ensure that the fastening screws are seated correctly and tightened evenly.
Unevenly tightened fastening screws can result in leaks!
3. Insert the combustion chamber carefully into the unit and align it correctly before fastening it into place.
4. Check the flange seals and replace any that are defective before assembling the burner flange.
5. Fit the burner flange onto the unit housing using the four screws.

Note the "UP" sign!

6. Tighten the upper 2 fastening screws firmly and then tighten the lower ones [14] gently so that the burner flange can still be pulled together.
7. Slide the flame tube of the burner into the burner flange.
Note dimension X (30 mm).
8. Clamp the flame tube firmly into place with the flange whilst lifting the burner slightly (3° tilt).
9. Finally, tighten the two lower screws [14] an.

Concluding work

1. Tighten the fastening screws on the combustion chamber supports.
2. Fit in the insulation and the lateral casing panel.
3. Fit the exhaust gas connection correctly.
Check the seals on the exhaust gas nozzle replace any that are defective.
4. Fit all cover panels by reversing the removal procedure and ensure that they and any seals are fitted correctly.
5. Re-establish all connections and check them.
6. Put the unit into operation and check that all operating modes are functioning correctly.

REMKO HTL-EC series

Commissioning of forced-air oil burners

Preparatory tasks

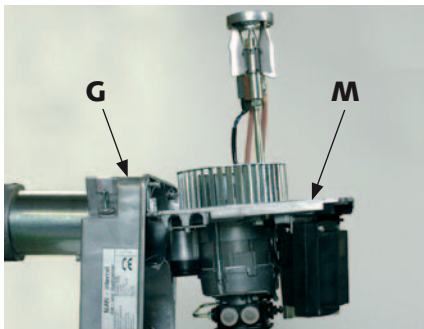
⚠ CAUTION

The commissioning of the forced-air oil burner may only be carried out by trained specialists.

After removing the 6 fastening bolts, the mounting baseplate [M] is pulled off the housing [G].

💡 NOTE

Because the air flap, up to size 44 is spring-loaded, this should be closed beforehand with the help of the adjustment screw 3 (turn adjusting screw approx. as far as scale value 1).

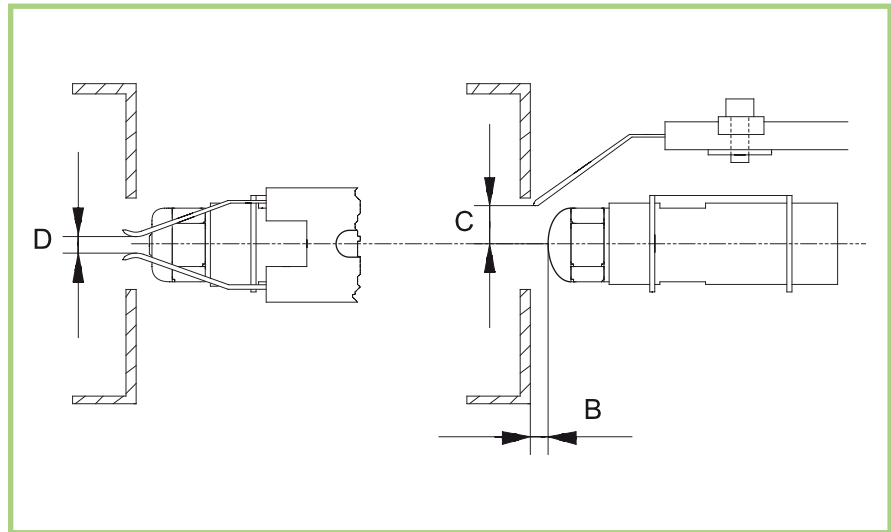


The most important functional parts for the installation/maintenance are now immediately accessible, as per the respective requirements.

Required nozzle sizes

The selection of the required oil nozzle is dependent on the pump pressure and the unit capacity. Only a nozzle that is approved for the respective combustion chamber geometry with corresponding spray angle and cone characteristics may be used. Refer to the technical data for the required oil nozzle size.

Adjusting the ignition electrode and baffle plate



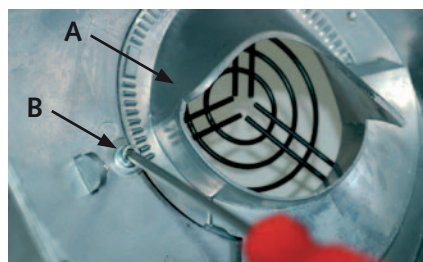
Air inlet nozzle

The required blower pressure can be adjusted with the adjustable air inlet nozzle [A] in accordance with the combustion chamber resistance and chimney draft, without having to change the output diameter.

1. Undo the Allen screw [B].
2. Turn the air inlet nozzle [A] to the desired position (note arrows!).

“min” = Smaller blower pressure

“max” = Larger blower pressure



Size/dimensions	B	C	D
HTL 200	7	5	3
HTL 250	7	5	3

All sizes are approximate values and are in mm. The optimum setting must be adapted to the unit-specific and structural conditions.

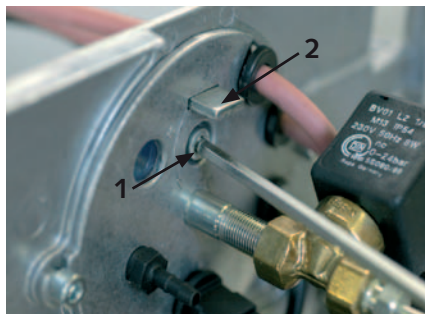
Mounting baseplate

After replacing the nozzle and carrying out any adjustments required to the air inlet nozzle [A], the mounting baseplate is re-fitted in reverse order.

💡 NOTE

The restrictions on exhaust gas losses per §11 of the ordinance on small furnace systems (1st. BImSchV) must be observed.

Adjusting the secondary air (nozzle fitting adjustment)



Carry out the presetting of the secondary air as follows:

Set the nozzle fitting [2] to the desired value with the adjusting screw [1].

Turning to the left (+)
= larger scale value
lower pressure behind the baffle plate
upper capacity range.

Turning to the right (-)
= smaller scale value
higher pressure behind the baffle plate
lower capacity range.



NOTE

The burner setting must be checked after every change of location and adapted to the new environmental conditions and atmospheric conditions if necessary.

Setting the pump pressure

The pump pressure should be adjusted, and checked if necessary, during burner commissioning and during every service.

Adjust the pump pressure as follows:

1. Remove the stopper on the measurement nozzle "P".
Remember to remove the seal.
2. Fit a suitable oil pressure manometer here.
3. Open all oil shut-off devices.
4. Switch on the burner.
5. Set the required oil pressure in accordance with the nozzle size and the unit capacity.
6. Please note that the required oil pressure of the full load stage (DV2) must be set up before the oil pressure of the partial load stage (DV1) because the DV2 pressure adjustment can have an impact on DV1.
7. Switch off the burner after completing the adjustments.
8. Remove the oil pressure manometer again.
Re-fit stopper incl. seal.



NOTE

Never let the pump run for extended periods without any fuel. Never leave the units for extended periods with a pump that has run dry.



ATTENTION

If the burner should carry out a fault shut-down once again after the start phase, then another reset should be carried out after a waiting period of 5 minutes has passed.

Further reset procedures must be prohibited as there is a danger of deflagration.

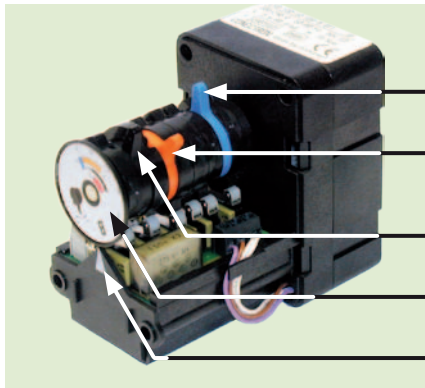


NOTE

All values provided are only preliminary settings and must be adapted or calibrated in accordance with the exhaust gas analysis.

REMKO HTL-EC series

Function of the actuator



- “Blue” shift lever, stage 1
- “Orange” shift lever, stage 2
- “Black” shift lever, solenoid valve stage 2
- Opening scale
- Opening indicator

The actuator LKS 130 has three stop positions and a switching contact for solenoid valve 2.

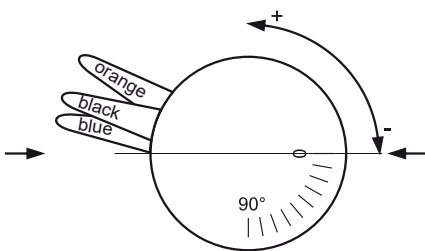


NOTE

The motor cam or air flap must not be adjusted manually (by hand). This will damage the actuator!

1.) Exclusion of air

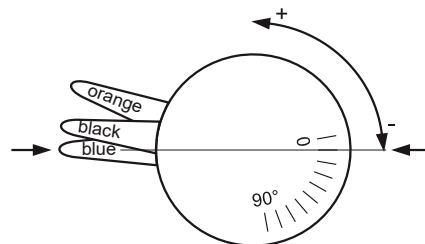
If the burner is not in operation, then the actuator will find itself in the air flap position (scale value 0). This position is pre-set in the factory and must not be changed.



Air volume “stage 1”

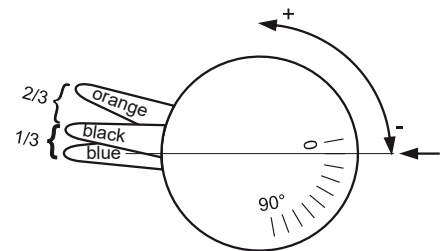
For pre-ventilation, start-up and operation with a “low” output, the actuator rotates to the switching point of the blue cam.

This results in a fixed opening angle for the air flap and a constant air volume for the 1st stage. If the air requirement is different, the air volume “stage 1” can be regulated using this adjusting level; standard value: approx. 30°.



Switching point “solenoid valve 2”

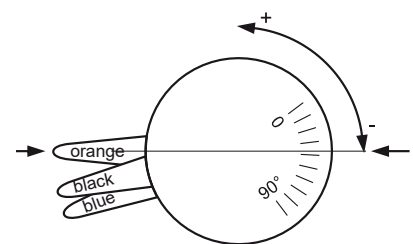
The black adjusting lever “solenoid valve 2” should be placed approx 1/3 of the way between the blue and orange levers.



4.) Air volume “stage 2”

If the burner is released for the second stage, the actuator rotates to the switching point of the **orange** cam.

While it is rotating, the black cam releases the oil volume for the second stage. *Standard value approx. 50°.*



IMPORTANT

During normal shutdown, the actuator moves back to the zero point that is pre-set in the factory.

The burner must be connected in accordance with the circuit diagram (permanent phase on L1).

Adjusting the air flap

The air flap is opened or closed until the soot pattern has an oil-free colour, soot "0 – 1" and the CO₂ value is 12 - 14 %. When carrying out the settings, keep in mind that the soot level may climb and oil may appear in the soot pattern if there is significant excess air.

If the flame should give off sooty smoke or break away with a fully opened air flap, reduce the pressure behind the baffle plate using the adjusting screw.

Adjusting the air volume "stage 1"

Blue shift lever

Disconnect the 4-pin plug connection (thermostat stage 2). Rotate the **orange** shift lever "air volume stage 2" and **black** shift lever "solenoid valve 2" in a clockwise direction to such an extent that neither switching cam is pressed in order to ensure that adjustments to the switching cam "air volume stage 1" are not hindered.

Stage 1, less air:

Move the **blue** shift lever in an anti-clockwise direction to a smaller opening angle. If the burner is operational, the actuator will rotate automatically.

Stage 1, more air:

Move the **blue** shift lever in a clockwise direction to a larger opening angle.

If the burner is operational, the actuator will rotate automatically.

Adjusting the switching point "solenoid valve 2"

Black shift lever

Rotate the shift lever for "solenoid valve 2" back in an anti-clockwise direction and place the switching point "solenoid valve 2" just behind the switching point "air volume stage 1". The switching point "solenoid valve 2" will now work between the settings "air volume stage 1" and "air volume stage 2".



IMPORTANT

Ensure that the switching cam of "solenoid valve 2" cannot under any circumstances be pressed before the switching cam "air volume stage 1", otherwise "solenoid valve 2" in the area "air volume 1" will open and the burner will operate with a significant air deficiency.

Adjusting the air volume "stage 2"

Orange shift lever

Rotate the shift lever for "air volume stage 2" back in an anti-clockwise direction and place the switching point for "air volume stage 2" behind the switching point "solenoid valve 2" in line with the burner output. Re-establish the 4-pin plug connection (thermostat stage 2). The actuator moves to the position "air volume stage 2" via "solenoid valve 2".

Stage 2, less air:

Move the **orange** shift lever in an anti-clockwise direction to a smaller opening angle. Switch the burner back to stage 1 briefly. After re-activating stage 2, the actuator rotates to the modified air volume.

Stage 2, more air:

Move the **orange** shift lever in a clockwise direction to a larger opening angle.

If stage 2 is operational, the actuator will rotate automatically.



ATTENTION

The actuator or the air flap must not be subjected to mechanical contact at any point or this will result in damage to the actuator.



IMPORTANT

Once the calibration of stage 2 is complete, fine-tuning of the 1st stage may only be carried out using the blue adjusting lever or the pump pressure for the small load. Changes to the nozzle fitting or the air inlet nozzle will eliminate the settings for the 2nd stage

REMKO HTL-EC series

Troubleshooting

The unit does not start

CAUTION

Before undertaking any work on the units, the power plug must be removed from the mains socket.

1. Check power supply.
2. Move the operating switch to the "1" (Heating) position.
3. Check if the strapping connector or the room thermostat plug, if fitted, is seated properly and making good contact.
4. Check the setting of the room thermostat.
The temperature set must be higher than the current room temperature.
5. Check whether the safety temperature limiter (STB) has tripped.
6. Before resetting the STB, ensure that the causes have been analysed and rectified.

The following causes are possible:

- The unit was not able to cool down because the electrical connection was interrupted.
 - The outlet temperature is too high due to incorrectly implemented air ducting when operating with hoses.
 - Air inlets or outlets are not free or are inadequate.
7. Move the operating switch to the "2" (Fan) position.
If the supply air fan now starts up the fault may well be in the burner area.

Forced-air burner and power supply

1. Check the oil filter(s) for contamination. Replace contaminated oil filter(s).
2. Check whether all of the stopcocks for the oil supply are open.
3. Check the fuel tank for sufficient fuel level.
4. Check the heating oil for paraffin separation.
Possible even from 5 °C!
5. Check the oil supply for damage and potential leaks.
6. Check the probes and capillary tubes on the triple-function combination controller for damage (see description in "Safety equipment")
7. Check whether the fault indicator light "Burner fault" is illuminated; if so, reset the burner.
8. Check the forced-air burner for possible damage to the nozzles, baffle plate, filter etc.

ATTENTION

If the forced-air burner carries out a fault shutdown during the start phase, then another reset should be carried out after a waiting period of 5 minutes has passed.

Further reset procedures must be prohibited as there is a danger of deflagration!

Supply air fan does not start

1. Check whether switching relay K1 is engaged.
2. Check if the fan blade rotates freely and runs smoothly.
3. Check the mains fuses F1-F3 in the control cabinet.
4. Check the electrical cable in the fan for damage.
5. Use appropriate means to check that the temperature controller (TR) is functioning properly.

ATTENTION

Repair and maintenance work on the burner and the electrical installation must be performed exclusively by authorised specialists for safety reasons.

Intended use

The units are designed exclusively for heating and ventilation purposes in industrial or commercial use (not for living space heating in private use) on the basis of their structural design and equipment.

The units must only be operated by appropriately instructed personnel.

With non-observance of the manufacturer's specifications, the respective local legal requirements or after arbitrary alterations to the units, the manufacturer shall not be liable for resulting damages.

Customer service and guarantee

As a prerequisite for any guarantee claims to be considered, it is essential that the ordering party or their representative complete and return the **"Certificate of guarantee"** to REMKO GmbH & Co. KG at the time when the units are purchased and commissioned.

The units were tested at the factory several times to verify their correct function. However, if malfunctions should arise that cannot be remedied by the operator with the assistance of the troubleshooting section, please contact your specialist dealer or contractual partner.



Environmental protection and recycling

Disposal of packaging

When disposing of packaging material, please consider our environment.

Our units are carefully packed and delivered in stable transport packaging and, if applicable, on a wooden pallet.

The packaging materials are environmentally-friendly and can be recycled.

By recycling packaging materials, you make a valuable contribution to the reduction of waste and conservation of raw materials.

Therefore, only dispose of packaging material at appropriate collection points.

Disposal of the old unit

The manufacturing process for the units is subject to continuous quality control.

Only high-grade materials are processed, the majority of which are recyclable.

You also contribute to environmental protection by ensuring that your old equipment is only disposed of in an environment friendly manner.

Therefore, only bring the old unit to an authorised recycling business or to an appropriate collection point.



NOTE

Operation that differs from that specified in this operating manual is prohibited. With non-observance, any manufacturer liability or guarantee claims are voided.

NOTE

Adjustment and maintenance work may only be carried out by authorised and qualified technicians.

NOTE

We recommend entering into a maintenance contract with an authorised specialist company to allow for regular maintenance and cleaning work to be carried out.

CAUTION

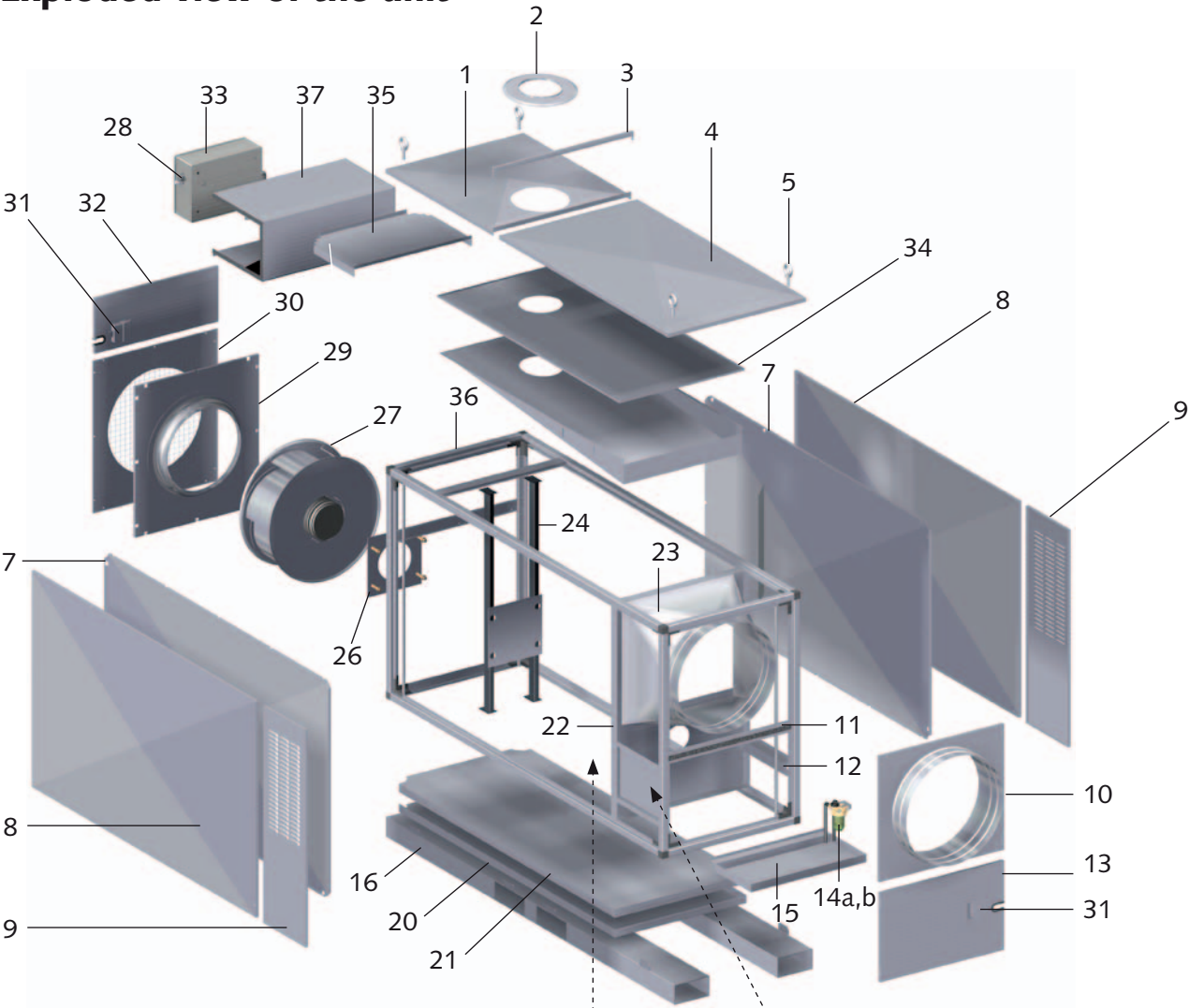
Failing to adhere to the operational cleaning and burner adjustment schedule nullifies any warranty claims against the manufacturer!

ATTENTION

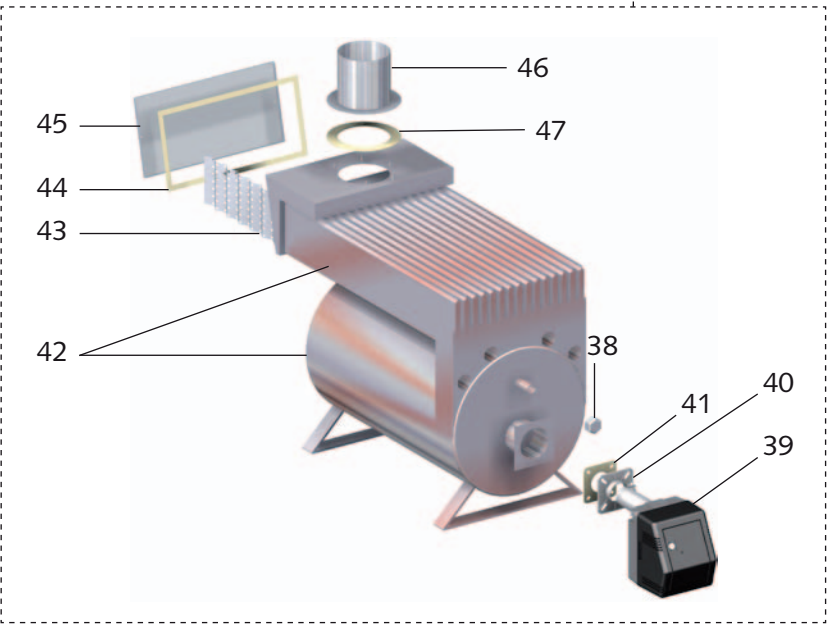
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REMKO HTL-EC series

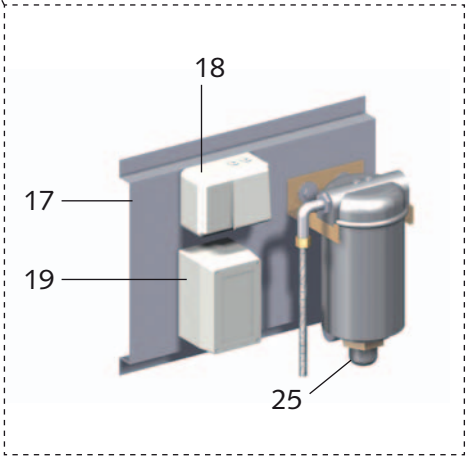
Exploded view of the unit



Combustion chamber with heat exchanger



Mounting panel, electrical, with attachments



We reserve the right to modify the dimensions and design as part of the ongoing technical development process.

Spare parts list

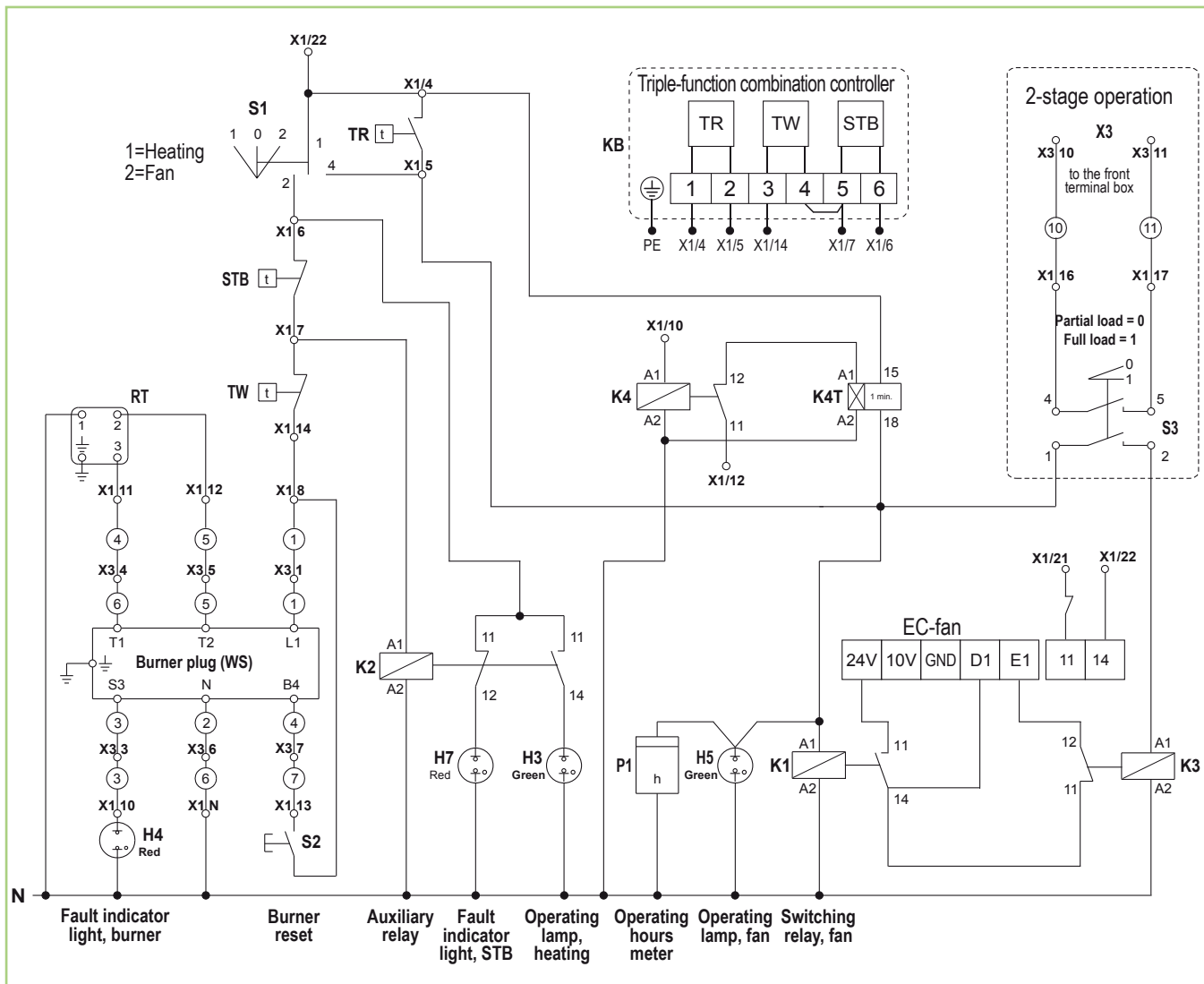
No.		HTL 200-EC	HTL 250-EC
		EDP no.	EDP no.
1	Cover panel, rear	1105335	1105335
2	Collar for exhaust gas nozzle	1103023	1103023
3	Connection profile	1105312	1105312
4	Cover panel, front	1105336	1105336
5	Crane eye	1102554	1102554
6	Insulation, top	1105433	1105433
7	Insulation, left/right	1105413	1105413
8	Casing panel, lateral, rear (left/right)	1105339	1105339
9	Casing panel, lateral, front (left/right)	1105411	1105411
10	Outlet nozzle	1105341	1105341
11	Mounting rail, front/rear	1105414	1105414
12	Mounting panel for oil filter	1105342	1105342
13	Lockable door on burner	1105382	1105382
14 a	Oil filter with stopcock (2-line)	1102526	1102526
14 b	Oil filter with stopcock (1-line)	1002501	1002501
15	Oil basin	1105344	1105344
16	Substructure	1105345	1105345
17	Mounting panel, electrical	1105346	1105346
18	Double socket	1105408	1105408
19	Distribution box	1105409	1105409
20	Base plate	1105386	1105386
21	Insulation, bottom	1105347	1105347
22	Partition, front	1105352	1105352
23	Outlet nozzle	1103029	1103029
24	Fan support	1105388	1105388
25	Oil pre-heater	1105301	1105301
26	Fan base	1105297	1105297
27	EC-fan	1105258	1105298
28	Thermostat receptacle bracket	1102048	1102048
29	Suction panel with inlet nozzle	1105279	1105279
30	Casing panel, rear (with protection grid)	1105278	1105278
31	Snap lock with padlock	1105302	1105302
32	Lockable door, electrical	1105398	1105398
33	Switching cabinet, compl.	1105259	1105259
34	Sealing panel	1105448	1105448
35	Insulation, top, rear	1105449	1105449
36	Complete unit frame	1105463	1105463
37	Mounting panel for switch box	1105403	1105403
38	Sealing cap	1103032	1103032
39	Complete forced-air oil burner	948510	948510
40	Burner flange	1108539	1108539
41	Flange seal	1108538	1108538
42	Complete combustion chamber with heat exchanger	1103055	1105381
43	Exhaust gas suppressor, set	1105299	1105299
44	Seal for inspection cover	1105406	1105406
45	Inspection cover	1105407	1105407
46	Exhaust pipe nozzle	1105360	1105360
47	Seal for exhaust pipe nozzle	1103020	1103020
xx	Triple-function combination controller	1102562	1102562
xx	Mains cable with plug	1105362	1105362
xx	Thermostat plug (accessory)	1101020	1101020
xx	Strapping plug	1101019	1101019
xx	Seal for cover panel, rear	1105452	1105452

xx = not illustrated

When ordering spare parts, please state the EDP no., unit number and type (see name plate)!

REMKO HTL-EC series

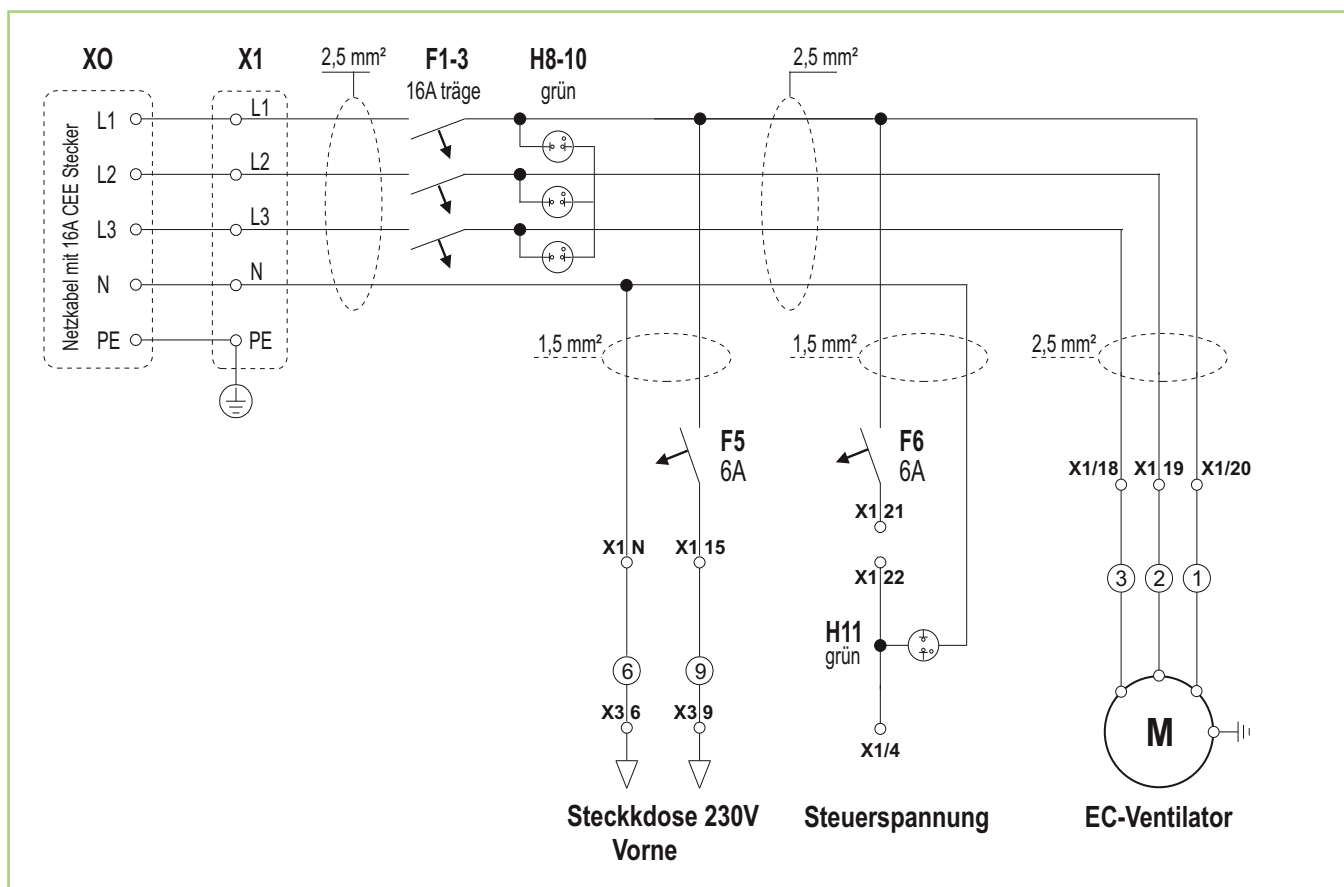
Electrical wiring diagram with EC-fan



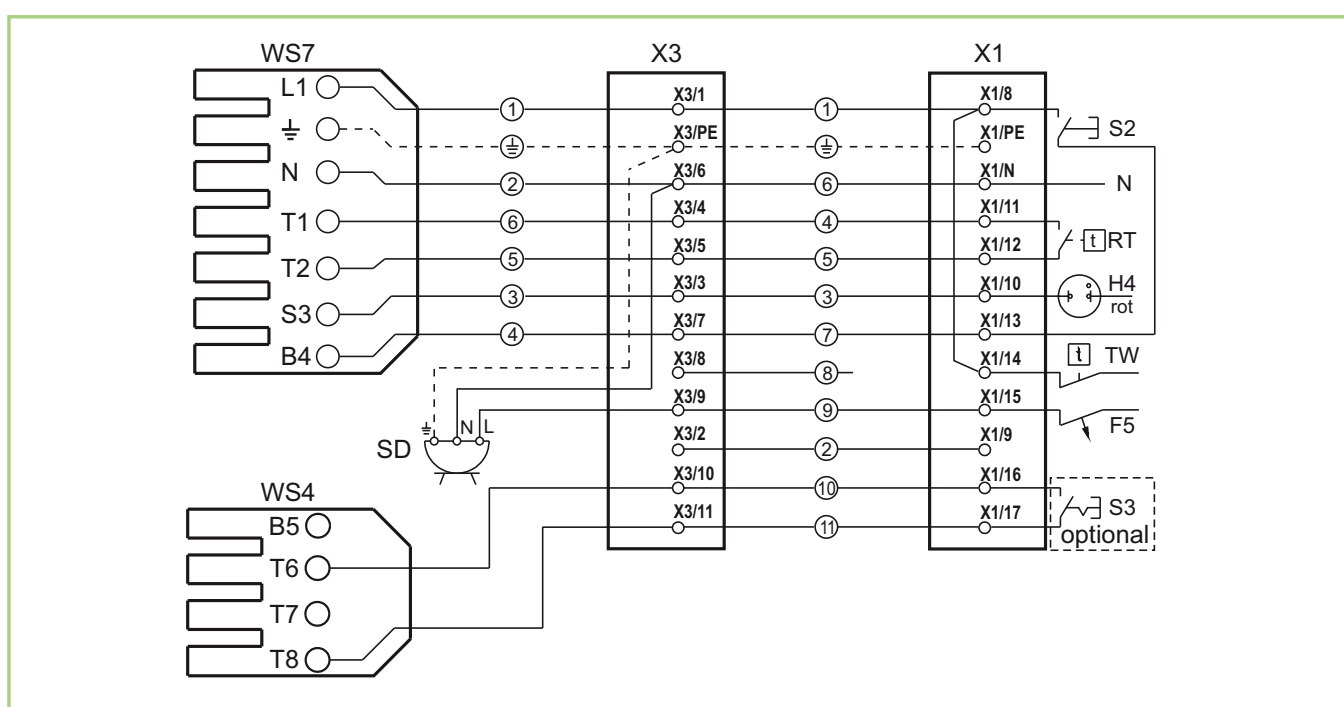
Legend:

F1-3 = Mains fuses 16A slow	KB = Triple-function combination controller
F5 = Mains fuse 6A (socket, front)	M = EC-fan motor
F6 = Control fuse 6A	P1 = Operating hours counter
H3 = Operating lamp (heating)	RT = Room thermostat socket
H4 = Fault indicator light (burner)	S1 = Operating switch
H5 = Operating lamp (fan)	S2 = Burner reset button
H7 = Fault indicator light (temperature limiter)	SD = Double socket, front
H8- = Indicator lights	STB = Safety temperature limiter
H10 (grid phases)	TR = Temperature controller
H11 = Indicator light, control phase	TW = Temperature monitoring device
K1 = Relay, fan controller	WS7 = Burner Wieland plug
K2 = Relay, display lamps	WS4 = Additional Wieland plug
K3 = Relay, switching (1st/2nd stage)	X0 = Mains cable with 16A CEE plug
K4 = Relay, burner fault	X1 = Switch box terminal block
K4T = Time relay	X3 = Terminal block, front

We reserve the right to modify the dimensions and design as part of the ongoing technical development process.



Wiring diagram for Wieland plug to the burner



REMKO HTL-EC series

Maintenance protocol



Unit type: Unit number:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Unit cleaned - outside -																				
Unit cleaned - inside -																				
Fan blades cleaned																				
Combustion chamber cleaned																				
Heat exchanger cleaned																				
Exhaust gas suppressors replaced																				
Inspection cover seal replaced																				
Fuel filter insert replaced																				
Safety equipment checked																				
Safety devices checked																				
Unit checked for damage																				
Electrical safety check																				
Burner maintenance *)																				
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

*) Have the forced-air burner maintained and adjusted only by authorised specialists and in accordance with the legal provisions (1st. BImSchV.). A corresponding measurement log should be generated.

Unit to be maintained only by authorised specialists in accordance with the statutory regulations.

Technical data

Series		HTL 200-EC	HTL 250-EC
Max. nominal heating capacity	kW	150* / 200	160* / 220
Nominal heat capacity	kW	137* / 182	146* / 201
Nominal flow rate ¹⁾	m ³ /h	9,120* / 12,750	10,980* / 14,440
(Max. total) pressure	Pa	400* / 760	560* / 870
Fuel		EL heating oil, diesel fuel, biodiesel B7/B10 ⁴⁾ , biofuel HVO ⁵⁾	
Max. fuel consumption	l/h	14.9* / 19.9	15.9* / 21.9
Danfoss oil nozzle ²⁾	USG	3.5/80°	3.5/80°
Pump pressure approx. (1st stage/2nd stage) ²⁾	bar	9*/16	10*/18
Max. exhaust gas loss	%	9	9
Combustion chamber resistance (in operational state)	Pa	110	135
Required flue draft	Pa	0	0
Power supply	V/Hz	400/3~N/ 50	400/3~N/ 50
Max. power consumption (complete unit)	kW	5.7	6.0
Max. nominal current (complete unit)	A	10.0	11.0
Max. power consumption (fan)	kW	4.9	5.2
Max. nominal current (fan)	A	7.2	8.4
Power consumption (fuel pre-heating system)	W	300	300
Electrical protection (provided by the customer)	A	3 x 16	3 x 16
Temperature increase (Δt)	K	57	56
Sound pressure level L _{pA} 1m ³⁾	dB (A)	66* / 75	69* / 77
Air intake Ø (Intake port accessories)	mm	600	600
Air outlet Ø	mm	550	550
Exhaust gas nozzles Ø	mm	200	200
Total length	mm	2,400	2,400
Total width	mm	800	800
Total height	mm	1,370	1,370
Weight (with forced-air oil burner)	kg	505	505

1) At Δt 45K / 1.2 kg/m³)

2) The specified nozzle sizes and pump pressures are based on test bench results.

The oil flow rate was derived from this.

Based on the product-specific nozzle and pressure tolerances as well as the oil temperature, the specifications should only be considered as guidelines.

3) Workplace-related emission value 1m L_{pA} as per DIN ISO 11203 (without burner mode).

4) Maximum biodiesel admixture (FAME) of 10%.

5) Hydrogenated vegetable oils that satisfy the requirements of DIN EN 590.

* 1st stage (partial load)

[illegible]



Notes

[illegible]

REMKO QUALITY WITH SYSTEMS

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