# Operating and installation instructions

## REMKO VRS-C series

## Universal heating units for oil and gas firing

VRS-C 30, VRS-C 50, VRS-C 70, VRS-C 100, VRS-C 120, VRS-C 170

## Content



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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!*

## Safety notes

### 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 units.

The units have been subjected to extensive material, functional and quality inspections prior to delivery. However, dangers can result from the units if they are used improperly or not as intended by

untrained personnel.

Please observe the following notes:

- The units may only be operated by persons that have been instructed in the operation of the equipment
- The units must be installed and operated in such a way that personnel are not endangered by radiant heat and no fires may occur
- The units must only be operated in areas where the units can be supplied with an adequate amount of air for combustion **If this cannot be ensured, a separate burner fresh air intake from outside must be installed.**
- The units may only be installed on a non-combustible surface
- The units may only be mounted on stable structures or ceilings made of non-flammable construction materials and with sufficient bearing capacity
- The fastening must take place with bearing anchors, which are to be fastened to the unit
- The units may not be installed or operated in potentially flammable or explosive environments
- The units must be installed away from traffic zones - also by crane, for example.
- A safety zone with a clearance of 1 m must be ensured
- The protective grid of the intake must always be kept free of dirt and loose objects
- Never insert foreign objects into the unit
- The units must not be exposed to direct jets of water e.g. **pressure washers, etc.**
- Never allow water to enter the inside of the units
- All electrical cables for the units must be protected against damage (including damage caused by animals)
- Portable fuel containers must only be set up and used in observance of the technical rules for combustible liquids "TRbF 20".
- This unit can be used by children above the age of 8, as well as by people with impaired physical, sensory or mental capabilities or a lack of experience and knowledge if they are supervised or have received instruction in the safe operation of the unit, and if they understand the associated potential hazards. Children must never play with the unit. Cleaning and user maintenance must not be carried out by unsupervised children.

**⚠ CAUTION**

*If the unit is delivered from the factory without a forced-air burner and a third-party burner brand is used, it is essential to ensure that it is suitable for the respective type and brand of fan-assisted heater.*

**NOTE**

*Only type-approved forced-air oil burners in WLE design per DIN EN 298 and DIN EN 267 (oil) as well as DIN EN 676 (gas) should be used.*

# Unit description

The units are stationary, directly fired fan-assisted heaters (WLE) with heat exchanger and exhaust gas connection.
The units can be directly fired with EL heating oil, diesel fuel, liquid gas or natural gas.

The units are designed exclusively for operation with separate forced-air burners in **1-stage operation** and, as of the VRS-C 100, with **2-stage operation**.

For the safe discharge of exhaust gases above the roof, the units must be connected to a suitable exhaust system.

The units are equipped as standard with 1-stage, low-noise/low-maintenance centrifugal fans and with attached and electrically wired switching and control devices.

The robust construction and careful processing of the units, which are made exclusively of high-quality materials, guarantee many years of trouble-free operation.
Further plus points are the simple, fast and cost-effective installation and service-friendliness of the units.

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

**Locations at which units are used**

As directly fired fan-assisted heaters (WLE), the units deliver instant heat.
The units are designed exclusively for industrial or commercial use.
The units can be equipped with air ducts on the intake/outlet side if designed accordingly.

As a rule, there are hardly any restrictions on their use with regard to the installation location.

**The units may be used among other things for the following:**

- Heating / temperature control of workshops
- Heating / temperature control of warehouses
- Heating / temperature control of event halls
- Heating / temperature control of exhibition halls
- Heating / temperature control of lightweight-construction halls
- Heating / temperature control of sales rooms
- Heating or frost protection in garden/agricultural outbuildings

**NOTE**

*The units are not suitable for the heating of living spaces or the like.*

**CAUTION**

*The units are to be used exclusively for industrial and commercial applications. They are not intended for the heating of living spaces or the like.*

## Mode of operation

After switching on the units by pressing the "Heating" selector switch, the forced-air burner switches on.

The lamp on the "Heating" selector switch lights up as an indicator.
The combustion chamber with heat exchanger is now heated up.

When the setpoint temperature is reached, the supply air fan switches on automatically.
The "Fan" operating lamp on the ventilation selector switch lights up.
Warm air is blown out.

When operating with a room thermostat, this process is repeated automatically depending on the heating requirement.

The controller unit and the automatic burner (component of the forced-air burner) execute all unit functions fully automatically and ensure reliable monitoring.

After switching off the units via the operating switch or the room thermostats, the supply air fan runs to cool the combustion chamber and the heat exchanger for a certain time and then switches off automatically.

In the event of irregularities or if the flame is extinguished, the automatic burner switches off and interlocks the burner.

The automatic burner fault lamp and the red "burner" fault lamp light up.
The units can only be restarted after manually resetting the automatic burner.

The safety temperature limiter (STB) interrupts the burner function in the event of overheating.
Manual resetting of the STB can only be implemented after the unit has cooled down.

**⚠ CAUTION**

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

**NOTE**

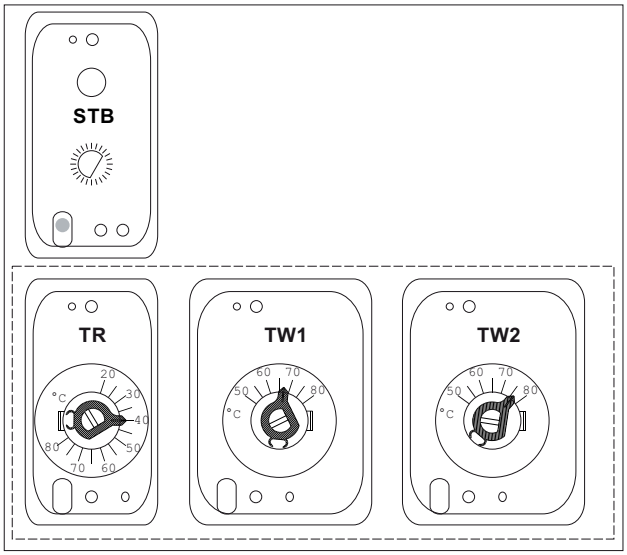
*Before resetting the automatic burner relay or safety thermal cut-out, first always determine the causes of the fault shut-down.*

# Safety device

### Controller unit per DIN EN 14597

Oil-fired or gas-fired warm air heaters must be equipped with intrinsically safe control devices in accordance with DIN EN 14597.

### REMKO controller unit




### The 4 functions of the controller unit:

1. **Fan controller (TR)**
   Controls the switching on and off of the fan. The switching point is set via the "setting lever TR".

2. **Temperature monitor for the burner (TW 2)**
   The temperature monitor limits the discharge temperature. The switching point is set via the "setting lever TW 2".
   **Setpoint value approx. 75 – 80°C**

3. **Temperature switch for the second stage of the burner (TW 1)**
   The temperature switch controls the stage of the burner. If the set temperature is exceeded, the burner is switched to the lower stage (partial load operation). The switching point is set via the "setting lever TW1".
   **Setpoint approx. 10-15 K below TW2**

4. **Safety thermal cut-out (STB)**
   Takes over the control function of the temperature monitor. Switching point fixed at 100°C. A restart interlock prevents the burner from restarting after tripping. The reset button (RESET) must be operated manually from the outside with the housing cover closed.

**⚠ CAUTION**

*In order to prevent a renewed exceedance of the triggering temperature the operating conditions of the unit should be checked before resetting the STB.*

**NOTE**

*When replacing the controller unit, only an original REMKO spare part may be used!*

### Controller unit

The controller unit has a probe self-monitoring function and is cold-proof down to -20°C. The unit switches off below -20°C, but switches on again when the temperature rises and is then fully functional.
In the event of the probe or the capillary tube being damaged, as well as if a temperature of approx. 220°C is reached, the filling medium will be emptied and the controller unit will switch off for safety. The controller unit is no longer fully functional and must be replaced.

**To replace the controller unit, observe the following instructions, among others:**

- The capillary tubes must not be damaged or kinked during installation
- Bends may only be made on the capillary tube and not on the probe
- For safe operation of the unit, the probes must always be exposed in the hot air flow
- The probes must always be free of dust and dirt
- Capillary tubes and probes must not show any damage
- The probes must not be in contact with the combustion chamber or other metal parts

**⚠ CAUTION**

*Careful and professional installation or assembly must be ensured.*

**⚠ CAUTION**

*Safety devices may not be bypassed or disabled during unit operation!*

## Installation instructions

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

The first enactment of the (German) Federal Emission Control Act (1st BlmSchG) and the statutory provisions of the ordinance governing small combustion plants (1st BlmSchV) must also be applied.

The fuel supply must be installed in accordance with DIN 4755 for oil-fired warm air heaters, DVGW Code of Practice G 600 for gas-fired warm air heaters and TRF for liquid gas.

However, fan-assisted heaters in particular are excluded from some points.

**NOTE**

*Only type-approved forced-air oil burners in WLE design (per DIN EN 267) or gas burners (per DIN EN 676) should be used.*

**NOTE**

*If the units are supplied from the factory with an oil or gas forced-air burner, separate operating instructions for the burner are enclosed.*

**CAUTION**

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

**CAUTION**

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

### Selection of the installation location

With determination of the installation location, the requirements must be coordinated in regard to:

1. Fire protection and operational hazard.

2. Function:
   Space heating free-blowing or with duct system.
   **Observe pressure conditions in the installation room.**

3. Operational issues:
   Heat requirement, air volume flow, recirculation or fresh air operation, humidity, air distribution, room temperature, space requirement.

4. Facility for connecting to an exhaust gas system.

Oil and gas-fired fan-assisted heaters (also with a nominal heat output of more than 50 kW) may generally be installed outside of heating rooms in compliance with the FeuVo.

The building authority guideline for the "Erection and installation of combustion appliances" must be observed.

For rooms in which highly flammable substances or mixtures are processed, stored or produced in such quantities that ignition creates hazards, exceptions may be permitted if suitable measures are taken to ensure that the substances or mixtures cannot be ignited by the combustion appliance.

### Combustion air supply

Sufficient supply of combustion air must be generally ensured by the respective building authority requirements.

Excerpts from the M-FeuVO (may differ slightly per federal state).

(1) For room-air dependent combustion appliances with a total nominal heat output of up to 35 kW, the combustion air supply shall be deemed to be verified if the combustion appliances are installed in a room that:
1. Has at least one door to the outside or a window that can be opened (rooms with connection to the outside) and a room volume of at least 4 $m^3$ per kW total nominal heat output or
2 . Has an opening leading to the outside with a clear cross-section of at least 150 $cm^2$ or two openings of 75 $cm^2$ each or pipes leading to the outside with cross-sections equivalent in terms of flow.

(2) For room-air dependent combustion appliances with a total nominal heat output of more than 35 kW and not more than 50 kW, the combustion air supply shall be deemed to be verified if the combustion appliances are installed in rooms that meet the requirements per paragraph 1 No. 2.

(3) For room-air dependent combustion appliances with a total nominal heat output of more than 50 kW, the combustion air supply shall be deemed to be verified,

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if the units are installed in rooms that have an opening or pipe leading into the open air. The cross-section of the opening must be at least 150 $cm^2$ and 2 $cm^2$ more for each kW of nominal heat output exceeding 50 kW. The pipes must be dimensioned to be equivalent in terms of flow. The required cross-section may be divided between a maximum of two openings or lines.

(4) Combustion air openings and lines must not be closed or blocked unless special safety devices ensure that the combustion appliance can only be operated when the closure is open. The required cross-section must not be narrowed by the closure or grille.

(5) By way of derogation from paragraphs 1 to 3, a sufficient combustion air supply may be demonstrated in another way for room-air-dependent combustion appliances. For example through: A continuous pipe of sufficient cross-section connected to the burner or its casing to the outside. This cross-section must be adapted to the available suction power of the burner and the line resistances (including the intake guard) so that proper combustion is ensured.

**Set-up**

- The units must then 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 a suitable exhaust gas system
- Room-air dependent units may only be installed in rooms or buildings from which air is extracted by means of fans, such as ventilation or exhaust air systems, etc., if:
  1. Simultaneous operation of the unit and the air extracting system(s) is prevented by safety devices,
  2. The exhaust gas routing is monitored by special safety devices,
  3. The exhaust gases from the unit are discharged via the air extraction system(s) or
  4. The design or dimensioning of the system ensures that no dangerous negative pressure can occur
- The units must be set down stably on a non-combustible surface away from traffic zones - also by crane, for example
- 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 may occur
- The equipment must be installed in such a way that it does not cause any hazards or unacceptable nuisances, e.g. due to vibrations, oscillations 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 whose improper operation can lead to dangerous operating conditions must be protected against unauthorised operation if they are generally accessible
- Direct intake of outside air is not recommended with the standard combustion chamber. When installing mixed air dampers (accessories), they must be coupled in opposite directions. The proportion of fresh air supplied should not exceed 30%
- The units may not be installed or operated in potentially flammable or explosive environments or areas

**NOTE**

*The units are suitable for use with accessories on the intake/ outlet side.*

**CAUTION**

*The standard version of the units is not suitable for exclusive use as supply air units.*

### Mounting on the ground

The units must be set down stably on a non-combustible surface away from traffic zones - by crane, for example.

To protect the units from damage in commercial premises, for unhindered maintenance and repair on the unit and burner, and for unhindered air intake and exhaust, a protective zone of 1 m around the unit must be kept clear.

This protection zone shall be marked by a sign with the following inscription:

**Protection zone**
**Keep a distance of 1 m**

Fixed demarcation is recommended for frequently used areas.

### Wall installation

The wall intended for installation must also consist of non-flammable materials. Its load capacity must be checked (reinforcements must be installed when necessary).

The brackets must be sufficiently anchored to the wall and the units must be securely fastened to them.

Sufficient clearances for maintenance of the heat exchanger, burner, fan and flue gas system must be provided.

- It must be possible to actuate control elements for the units and fuel supply from the ground
- If auxiliary equipment is required for monitoring, maintenance and repair work, this must be provided by the operator

### Mounting hanging units

The units may only be mounted on stable structures or ceilings made of non-flammable construction materials and with sufficient bearing capacity.

The fastening must take place with suitable anchors, which are to be securely fastened to the unit.

The requirements listed in the "Wall mounting" section must also be observed.

### Room heating

Fan-assisted heaters may only be operated in closed rooms and halls via a room thermostat.

### Fuel supply

The fuel supply must be installed in accordance with DIN 4755 for oil-fired warm air heaters, DVGW Code of Practice G 600 for gas-fired warm air heaters and TRF for liquid gas.

Particularly in the case of heating oil pipes, care must be taken to ensure that their cross-section is sufficiently large.
The suction lift, the total line resistances and increased viscosity at lower temperatures must be taken into account in the determination.
Appropriate separate oil production units may need to be provided.
The lines must be laid in such a way that they can be easily bled and are protected against corrosion and mechanical damage.

**⚠ CAUTION**

*The measured pressure of the suction pipe should not exceed minus 0.3 bar and must not exceed minus 0.4 bar.*

### Electrical installation

**⚠ CAUTION**

*The electrical connection of the unit must be carried out by authorised specialists in accordance with DIN EN 60335-1 and DIN EN 50156-1.*

Ensure that an impermissible undervoltage due to a mains overload is not possible, even if this is only temporary.

For the connection of the units, use cables with cross-sections that do not cause an impermissible drop in voltage even when the fan starts up.

When connecting the units in 400 V version, ensure the correct phase sequence of the rotating field (right).
An incorrectly made connection can lead to the fan turning in the wrong direction.

An emergency switch must be fitted in an easily accessible place in the room where the unit is installed for units with a rated heat power of 50 kW or more.

**⚠ CAUTION**

*All switches, if generally accessible, must be protected against damage and unauthorised use!*

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## Exhaust gas ducting

### Annual inspection and maintenance

In accordance with the operating conditions, the units must, if necessary, be checked at least yearly by a specialist to ensure that they are in a condition that is safe to use.

For reasons of operational readiness, functional safety, economic efficiency and compliance with the emission limits, the operator must have the units inspected at least once a year by a representative of the installer company or another expert.
For the measurement of the combustion values, the legal provisions of the BImSchV. shall be applied.

If defects are found, the operator must be informed that they must have components repaired or replaced immediately.

**The following applies to this:**
Repair work on the limiting devices, the self-regulating devices and the flame monitoring devices as well as on other safety devices may only be carried out on the individual device by the respective manufacturer or their authorised representative.

**NOTE**

*We recommend concluding a maintenance contract with an authorised specialist company for regular maintenance and cleaning work.*

As a rule, the units must be connected to a suitable and type-approved exhaust gas system.

**NOTE**

*The construction of the flue gas system is in any case subject to approval.*

Exhaust systems are structural installations in or on buildings that are exclusively intended to safely discharge exhaust gases from combustion appliances via the roof.

For the planning and construction of flue gas systems, the following are of particular importance:

- The respective combustion systems ordinance [FeuVo]
- The respective state building code [LBO]
- DIN 18160 Part 1, Planning and execution
- DIN EN 13384 Part 1, Thermal and fluidic calculation methods
- Technical rules for gas installation DVGW-TRGI 2018

**With the planning and installation of exhaust gas systems, the following points must be observed:**

- The installation and assembly of the flue gas system must be carried out professionally and in accordance with the applicable regulations
- The dimensions of the flue pipe must be designed in accordance with the unit power rating and the structural conditions or requirements
- Exhaust systems must be dimensioned in terms of clear cross-section and height in such a way that the exhaust gases are discharged into the open air in all intended operating conditions and no dangerous positive pressure can occur with respect to rooms
- The mouths of exhaust systems must project at least 40 cm above the ridge or be at least 1 m away from the roof surface
- If dynamic pressures are to be expected, e.g. due to downdrafts or from neighbouring buildings, the chimney head must be designed accordingly
- In the case of roof or wall ducts, the flue gas system must be routed through a pipe sleeve or a shaft to allow free expansion of the flue gas pipe when it heats up
- The unit connection must be tight and secured against unintentional loosening by means of a rivet or screw
- Horizontal flue gas sections should preferably be kept as short as possible
- A resealable measuring opening at a distance of 2 x flue pipe D(Ø) behind the unit connection must be provided

**CAUTION**

*There must be no counter pressure arising from incorrect installation of the exhaust gas ducting under any circumstances.*

# REMKO VRS-C Series

**Application examples:**

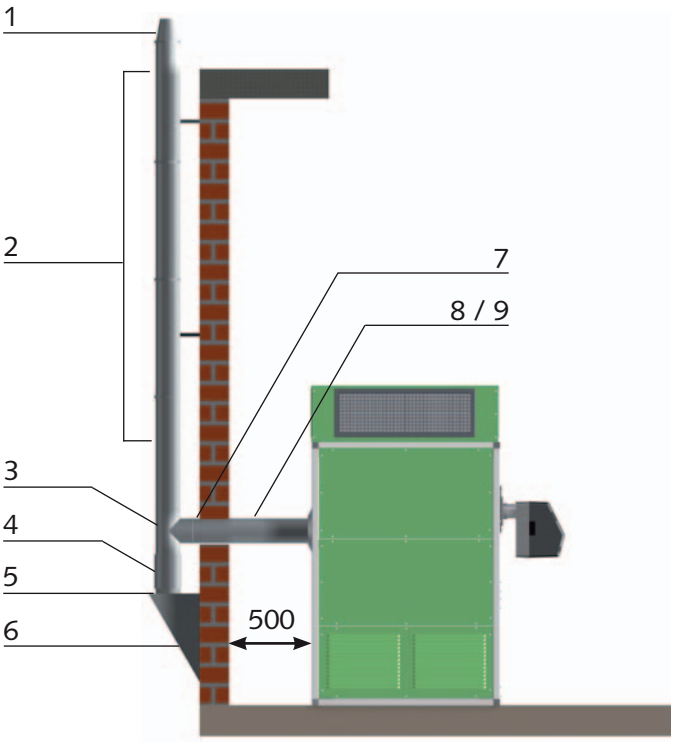
**REMKO ASD exhaust system**
Stainless steel, double-walled, outdoor mounting

**REMKO ASE exhaust system**
Stainless steel, single-walled, indoor mounting

The exhaust gas system components are connected very simply through mating, and are secured with clamps.

All REMKO stainless steel exhaust systems are generally approved by the institute for construction technology [Institut für Bautechnik].

**Example of upright unit installation**




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

## Condensate drainage

Correct implementation of the condensate trap is particularly important, a poorly designed trap impairs proper functioning of the unit.
The following points should be observed:

- Danger of accumulation of the condensate in the heat exchanger;
- Danger of freezing of the condensate in the pipes;
- Danger of exhaust gas discharge via the condensate drain.

**Condensate accumulation in the heat exchanger**

When installing the hot air generator, make sure that the surface is perfectly level, so that the characteristic inclination of the tube bundle is not affected.

**Connection of condensate discharge pipe**

The VRS-C heating units are delivered with condensate drainage at the side of the unit. Depending on the installation type, the condensate drainage can take one of the following forms:

- as free discharge;
- as discharge into rain gutters;

**NOTE**

*Disconnect the cap of the condensate drain before commissioning to allow regular operation.*

**Preventative measures**

The following materials should be used for condensate drains:

- Aluminium, stainless steel, silicone, Viton or EPDM hoses for hot pipes through which smoke is discharged;
- For cold pipes, through which only water flows, PVC pipes.

Do not use copper or galvanized iron.

**Anti-freeze protection**

The condensate disposal system must be effectively protected against the freezing of the circulating condensate.
It is recommended to install the condensate collection system within heated rooms. In the case of outdoor installations, the pipes must be connected by means of an open connection downstream of the siphon to prevent any ice formation in the outdoor installation from affecting the drainage of the condensate.
It is nevertheless advisable that the largest possible section is located inside the heated room, for example by collecting the condensate near the ground with a sloping pipeline in the room.

**Free discharge**

When the unit is installed outside and if the outside temperatures are not particularly low, no additional line needs to be connected to the condensate drainage line. It must be verified that the water discharge does not accumulate in the unit.
If the discharge is to occur via a pipe, an open port (cup-shaped) must be created to prevent the formation of ice in the pipe obstructing drainage of the condensate, thereby causing an accumulation of water in the heat exchanger.
In the case of drainage pipes in outdoor areas, it may be necessary to heat these by means of a heating element.

**Discharge via rain gutters**

Laying the condensate drainage in the space to be heated is a good solution to prevent the formation of ice; the drainage of the condensate can take place via rain gutters or it can be collected and treated with alkaline solutions.

**Neutralisation of the condensate**

The pH value of the resulting condensate is between 2.4-4.2 for heating oil and between 3.5-3.8 for natural gas.

If neutralization of the condensate is necessary, the corresponding articles are available as accessories. The following articles are available as accessories:

Neutralization box including calcium carbonate
EDP no.: 260400

Acid-resistant condensate pump
EDP no.: 260410

Further information can be obtained from Customer Service.

## Installation and assembly

When installing the units, the regulations and ordinances applicable to the respective federal state must always be observed.

**It should also be noted:**

**⚠ CAUTION**

*The transport pallet or timbers must be removed before installation.*

- The units must be installed in a stable position
- The units must be placed on the floor in a safe and stress-free manner, preferably on a separate vibration-damped base
- Make sure that the fan power (nominal pressure) is adapted to the respective air-side resistances **Measure nominal current!**
- Check that the inlet and outlet are free
- The supply of sufficient combustion air must be ensured
- If overpressure or underpressure or significant air impurities occur in the installation room, a separate burner fresh air intake (accessory) must be installed
- If significant air pollution is to be expected in the installation room, the recirculation air drawn in should be drawn in via appropriate filters (accessories) **The resistance on the suction side must be observed and the fan power must be adjusted accordingly!**

**NOTE**

*The air intake may only take place via the intake openings provided.*
*If the bottom of the unit is not designed as an intake variant, it must always be closed to prevent false air intake.*

### Exhaust gas connection

The design must comply with DIN 18160 Part 1, the dimensions with DIN EN 13384 Part 1.

- Proper exhaust gas routing must be ensured
- The flue gas connection must be carried out professionally in accordance with the applicable regulations
- The flue gas connection may only be made to a previously approved flue gas system

### Electrical connection

The electrical connection of the unit must be carried out by authorised specialists in accordance with DIN EN 60335-1 and DIN EN 50156-1.

- An emergency switch must be fitted in an easily accessible place on units with a nominal heat power rating of more than 50 kW
- The emergency switch must be protected against unauthorised operation

**NOTE**

*All connection terminals of the electrical wiring are to be checked for firm seating and tightened as necessary.*

### Room thermostat connection

The room thermostat (accessory) must be placed in a convenient location for temperature control.

The thermostat probe must not be located directly in the warm/cold air flow and must not be mounted directly on a cold base.

The same procedure must be followed when installing an automatic day/night temperature control or other temperature controls available as accessories.

### 400V unit versions

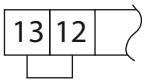
A room thermostat or a day/night temperature control is connected to the corresponding terminal blocks in the control box for these versions.

The connection must be made as follows:

Remove the factory cable bridge and connect the terminals with the corresponding wires of the respective control system.

***The respective separate connection diagrams of the control system and the unit must be observed!***

Terminal block **X2**




factory-made cable bridge

### Burner installation

The forced-air burner supplied by the factory is mounted on the front of the unit with a clamping flange.
**Observe the following points:**

- Only type-tested forced-air oil burners per DIN EN 267 in WLE design or forced-air gas burners (per DIN EN 676) may be used
- A power limitation for 1-stage burner operation (up to 70 kW) is not required for fan-assisted heaters (WLE)
- It is essential to set the burner to the full heat load of the unit
- The separate operating instructions for the factory-supplied burner must be observed
- When using forced-air burners from other manufacturers, it is essential to ensure that they are suitable for the unit (WLE version)

### Heating oil connection

Sufficient and professional fuel supply must be ensured.

- The suction pipe in the heating oil tank must be fitted with a foot valve as a matter of principle
- Even at low outside temperatures it is necessary to ensure that there is an adequate supply of heating oil that is capable of flowing. Depending on the quality of the heating oil, paraffin formation can start from approx. 5°C. **Appropriate measures must be taken to avoid this!**

### Gas connection

Adequate gas pressure and quantity of gas, in accordance with unit performance, must be continuously available during unit operation.

- Installation of the gas connection should be performed only by authorised specialists
- The DVGW Code of Practice G 600 for gas-fired fan-assisted heaters and the TRF for liquid gas must be observed
- Gas pressure regulators and shut-off valves must be provided by the customer as a matter of principle
- The cross-section of the pipe-work should be determined in accordance with the connection value of the unit, the total pipe-work resistance and the amount of gas supply pressure

**NOTE**

*Before initial commissioning, the gas supply line must be thoroughly cleaned and checked for leaks!*

**CAUTION**

*Assembly, set-up and maintenance work on the gas supply may only be carried out by specialist personnel authorised by the gas supply company!*

## Commissioning

### Commissioning the fan motor

#### Testing the drive

1. Check that the fastening screws of the entire fan are firmly seated.

2. Check the pretension of the drive belt(s).

**⚠ CAUTION**

*The correct rotating direction of the fan must be checked.*

### Measuring the current consumption

1. To avoid faulty measurements, open the grilles in the air duct or the exhaust hood.
   All intake or blanking plates provided are to be mounted on the unit.

2. Check the mains voltage for correctness.

3. Carry out the necessary measurements and adjust the settings if necessary.

**NOTE**

*To exclude measurement errors, each phase should be measured separately.*

The measured rated current must not exceed the value specified on the motor's name plate.

### Current consumption too high

If the fan motor draws too much current despite proper electrical connection and sufficient mains voltage, the air-side resistors (intake and outlet side) must be checked for correct dimensioning. Implement appropriate measures to remedy the situation

### Initial commissioning

The initial commissioning of the units and their forced-air burners must be carried out by the manufacturer or another authorised expert appointed by him. In doing so, all regulating, control and safety equipment must be checked for correct function and correct settings.

- The commissioning of oil and gas-fired units must always be carried out by authorised specialist personnel
- All screws and nuts of the fan and burner fastening must be checked for firm seating
- All air outlet grilles must be opened and adjusted if necessary
- The settings and function of the controller unit are to be checked
- Switch on the local main switch or fuses/breakers
- Set the room thermostat higher than the existing room temperature
- Open the fuel supply and switch on the “Heating” selector switch
- The fuel oil or gas flow rate must be set in accordance with the heat load of the unit
  **See unit name plate!**
- The burner must be set to optimum values in accordance with the manufacturer's specifications, but at least to those of the federal emission control act
- A measurement report must be generated and handed over to the operator for safekeeping
- The operator must be familiarised with the operation of the system
- The specialist contractor declaration and the contractor certificate of the respective installation company carrying out the work must be submitted to the responsible authorities

**NOTE**

*If the units are not set to their nominal heat load (see name plate) or if the design is too large for the required heat demand, the burners operate in cycle mode.*

*Since the required operating temperature of the heat exchangers cannot be reached in cycle mode, condensate formation inevitably increases.*

### Heating mode

The units operate fully automatically and in accordance with the room temperature.

1. Switch on the local main switch or fuse(s)/breaker(s).

2. Open the fuel supply.

3. Set the desired temperature on the room thermostat.

4. Switch on the "Heating" selector switch.

It should be noted that the forced-air burner switches on immediately when heat is required, but the supply air fan is only switched on automatically after the setpoint temperature has been reached. **This prevents the unwanted blowing out of cold air.**

### Ventilation

1. Switch on the ventilation selector switch.

In this switch position, the supply air fan runs permanently.
The units can be used for air recirculation or ventilation purposes.
Thermostatic control is not possible.

## Shutdown

Switch off both selector switches.

The supply air fan continues to run to cool down the heat exchanger and may start several times until it is finally switched off.

**⚠ CAUTION**

*The unit may never be switched off via the main switch or an emergency switch prior to the completion of the cool-down phase (except in emergencies).*

For longer periods of inactivity, the units should be disconnected from the mains and the fuel supply shut off.

## Care and maintenance

For reasons of operational readiness, functional safety, economic efficiency and compliance with emission limits, the operator shall have the installation inspected by an authorised expert at least once a year.

**⚠ CAUTION**

*Prior to maintenance or repair work, the unit must be disconnected from the mains power supply.*

**⚠ CAUTION**

*It is not sufficient to switch off the unit only via the operating switch!*

- The entire unit, including the heat exchanger, combustion chamber and forced-air burner, must be cleaned of adherent dust or dirt
- The combustion residues in the combustion chamber and in the heat exchanger are to be removed by appropriate means
- The V-belt tension and the motor fastening must be checked regularly
- Wear parts such as flue gas brakes, seals, oil filter insert, oil nozzles etc. must be checked and replaced if necessary
- It is essential to follow the maintenance instructions for the separate forced-air burners.
- The restrictions on exhaust gas losses per §1 paragraph 1 of the ordinance on small furnace systems (1st. BImSchV must be observed
- Proof of the work carried out by authorised specialist personnel, together with the usual logs, is therefore mandatory

**⚠ CAUTION**

*Adjustment and maintenance work on the unit and forced-air burner may only be carried out by authorised and qualified technicians!*

**NOTE**

*We recommend concluding a maintenance contract with an authorised specialist company for regular maintenance and cleaning work.*

**⚠ CAUTION**

*If the operational cleaning and burner adjustment intervals are not adhered to, all warranty claims will be invalidated!*

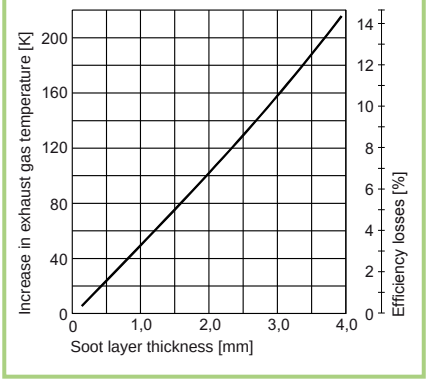
**NOTE**

*Contact the unit manufacturer before you replace the parts with parts or components other than those listed in the spare parts list.*

### Soot deposits

Even small deposits of soot on the heat transfer surfaces of the combustion chamber and heat exchanger will insulate the heat output.
This results in a deterioration of the combustion efficiency.

A soot layer just 1 mm thick can cause an exhaust gas temperature increase of approx. 50 K (see diagram).




As can be seen from the above, optimal burner adjustment and regular maintenance are indispensable for maintaining efficiency and emission limits.

## Cleaning the combustion chamber and heat exchanger

1. Disconnect the unit from the power supply.

**⚠ CAUTION**

*It is not sufficient to switch off the unit only via the operating switch!*

2. Shut off the fuel supply.

**Dismantle the following components:**

1. The forced-air burner.
2. Burner plate with burner flange.
3. Front cladding panel(s).
4. A side cladding panel and the insulation panel behind it (left or right, depending on the structural conditions).
5. The front inspection cover.
6. The side inspection cover.
7. Pull the flue gas brakes out of the heat exchanger tubes and clean them or replace them if damaged.
   **Note the arrangement of the exchanger tubes!**
8. Clean the heat exchanger tubes with suitable cleaning agents to remove adherent combustion residues.
9. Remove combustion residues from the front and rear collection boxes with a suitable vacuum cleaner.
10. The combustion residues in the combustion chamber must also be removed through the burner opening with a suitable vacuum cleaner.

    **A special boiler cleaning set for the REMKO industrial vacuum cleaner is available as an accessory.**
11. After the cleaning work is complete all parts should be carefully re-fitted in reverse order.

**⚠ CAUTION**

*The burner and all control devices must be checked for correct functioning.*

12. Ensure that the exchanger tubes are correctly seated and that all seals are in good condition.

    **Damaged or deformed seals must be replaced.**
13. Burner maintenance must also be carried out in accordance with the burner's separate operating instructions.

**NOTE**

*The restrictions on exhaust gas losses per §10 of the ordinance on small furnace systems (1st. BImSchV) must be observed.*

## Troubleshooting

### The unit does not start

- Check the customer-provided mains power supply
- Check the fuses in the control box.
  (400 V three-phase version only)
- Move the operating switch to the "I" or Heating position
- Check whether the "Burner" indicator light in the control box is illuminated (400 V version only)
- Check the thermostat connection or, if necessary, the cables of the room thermostat
- Check the setting of the room thermostat.
  The temperature set must be higher than the current room temperature
- Check whether the safety thermal cut-out (STB) has tripped

**⚠ CAUTION**

*Prior to maintenance or repair work, the unit must be disconnected from the mains power supply.*

**⚠ CAUTION**

*Before resetting safety equipment, the cause of the trigger must be identified and rectified.*

**NOTE**

*Safety devices may not be bypassed or disabled during operation of the unit!*

### The burner does not start

- Check the oil filter(s) for contamination. Replace contaminated oil filter(s)
- Check whether the shut-off cock on the oil filter is open
- Check the fuel tank for sufficient fuel level
- Check the fuel and the filter for paraffin precipitation.
  **Paraffin precipitation is possible as soon as the temperature drops below 5°C!**
- Check the oil hoses for damage and leaks
  **Air may be sucked in!**
- Check the safety thermal cut-out (STB)
- Check the temperature monitor (TW)
- Check the capillary tubes and probes of the triple/or quadruple combination controller for damage and correct positioning of the probes
- Check whether the fault lamp of the automatic burner lights up
- If the fault lamp illuminates, unlock the automatic burner by pressing the fault button.
  **The fault lamp extinguishes and the burner attempts to start!**

**⚠ CAUTION**

*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.***

**The supply air fan does not start**

Switch on the ventilation selector switch.
The supply air fan should now start!

**If not:**

- Check the customer-provided mains power supply
- Check the fan and drive can move freely
- Check the electrical cables on the fan motor for damage

**NOTE**

*If all of the functional checks have been carried out without any findings, please contact an authorised service station.*

**CAUTION**

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

**CAUTION**

*Adjustment and maintenance work on the unit and forced-air burner may only be carried out by authorised and qualified technicians!*

**Possible causes of malfunction:**

- The units were not able to cool down because the electrical connection was interrupted. Even a brief interruption of the power supply can cause the STB to trip
- Too high an outlet temperature due to incorrectly implemented air ducting or air louvre settings
- The air inlet or air outlet is not free
- Check the temperature controller (TR) for function and correct setting
- Check the temperature monitor (TW) for function and correct setting

# REMKO VRS-C 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 seals replaced | | | | | | | | | | | | | | | | | | | | |
| Burner flange gasket replaced | | | | | | | | | | | | | | | | | | | | |
| Fuel filter replaced | | | | | | | | | | | | | | | | | | | | |
| Safety equipment checked | | | | | | | | | | | | | | | | | | | | |
| Unit checked for damage | | | | | | | | | | | | | | | | | | | | |
| All fastening screws checked | | | | | | | | | | | | | | | | | | | | |
| Electrical safety check | | | | | | | | | | | | | | | | | | | | |
| Burner maintenance *) | | | | | | | | | | | | | | | | | | | | |
| Test run | | | | | | | | | | | | | | | | | | | | |

*) Have the forced-air oil or gas burner maintained and adjusted only by authorised specialist personnel and in accordance with the legal provisions (1st BImSchV.). An appropriate measurement log must be created and retained.

**Comments:** .....

.....

.....

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

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

## 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 unit design allows the use of air ducts on the intake and outlet side or unit accessories with the appropriate fan and motor design.

In the standard version, the units are not designed for exclusive use as supply air units.

The units must only be operated by appropriately instructed personnel.

A failure to observe the manufacturer's specifications, the respective local legal requirements or arbitrary alterations to the units, exempts the manufacturer from liability for resulting damage.

**⚠ CAUTION**



## 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 have been tested several times in the factory 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.

**NOTE**

*Adjustment and maintenance work may only be carried out by authorised specialist personnel.*

**NOTE**

*Operation that differs from that specified in this operating manual is prohibited.*
*Failing to observe this renders any manufacturer liability or guarantee claims void.*

## Environmental protection and recycling

### Disposal of packaging

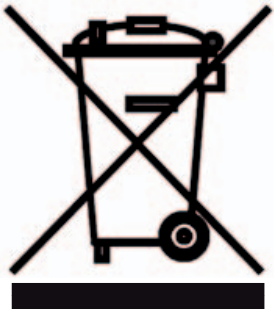
When disposing of packaging material, please consider our environment.
Our units are carefully packed and delivered in stable transport packaging and, if applicable, on a wooden pallet.
The packaging materials are environmentally-friendly and can be recycled.
By recycling packaging materials, you make 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.

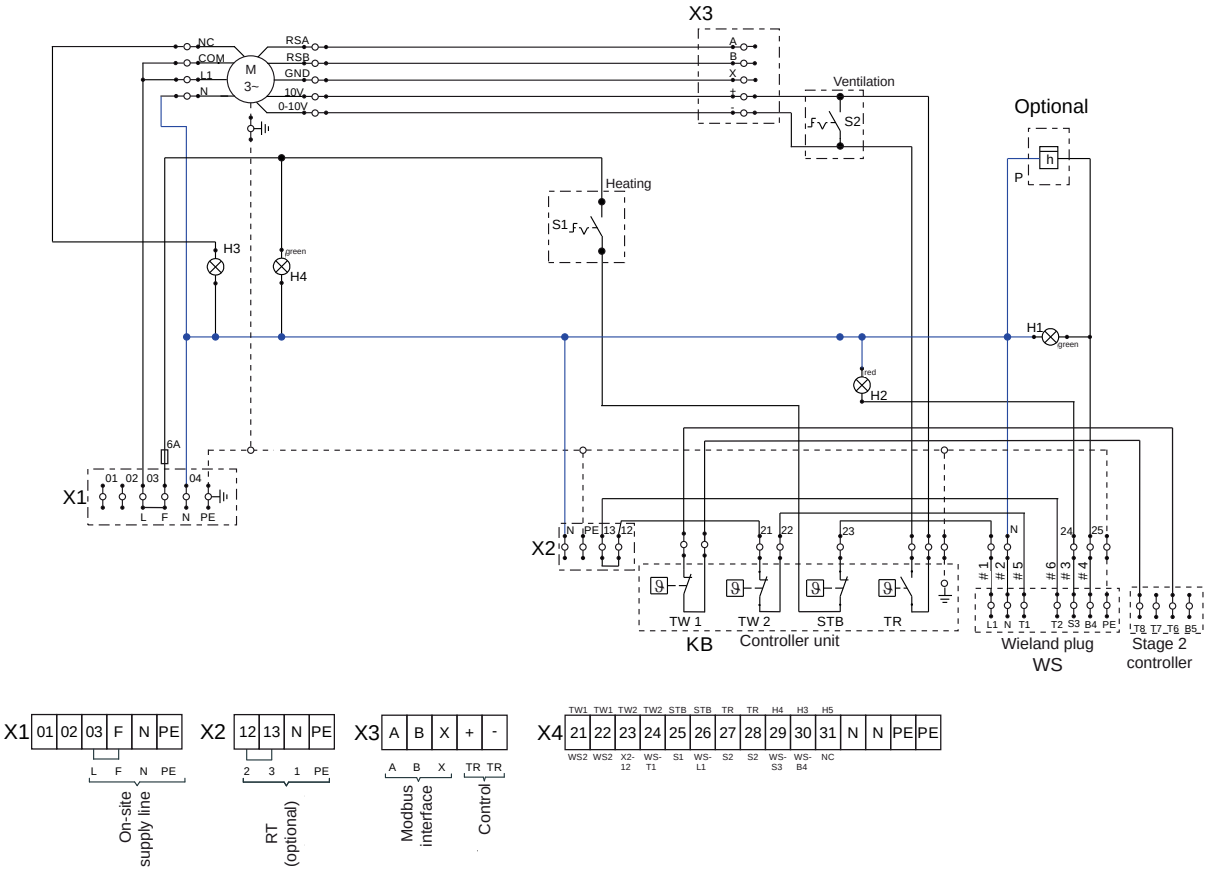
You also contribute to environmental protection by ensuring that your old equipment is only disposed of in an environment friendly manner.

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



# REMKO VRS-C Series

## Electrical wiring diagram 230 V







**Legend:**

F = Fuse, 6A
H1 = Heating indicator lamp (in the switch)
H2 = Ventilate indicator lamp (in the switch)
H3 = Burner operating lamp
H4 = Burner fault lamp
KB = Controller unit
M = Fan motor
P = Operating hours counter (optional)
RT = Room thermostat or regulation (optional)
S1 = Heating selector switch
S2 = Ventilate selector switch
STB = Safety thermal cut-out
TR = Fan controller
TW = Temperature monitoring device
X1 = Connection terminals supply line
X2 = Connection terminals room thermostat
X3 = Fan controller connection terminals

An emergency switch must be installed in an easily accessible place in the installation room (but outside any possible hazard zone).

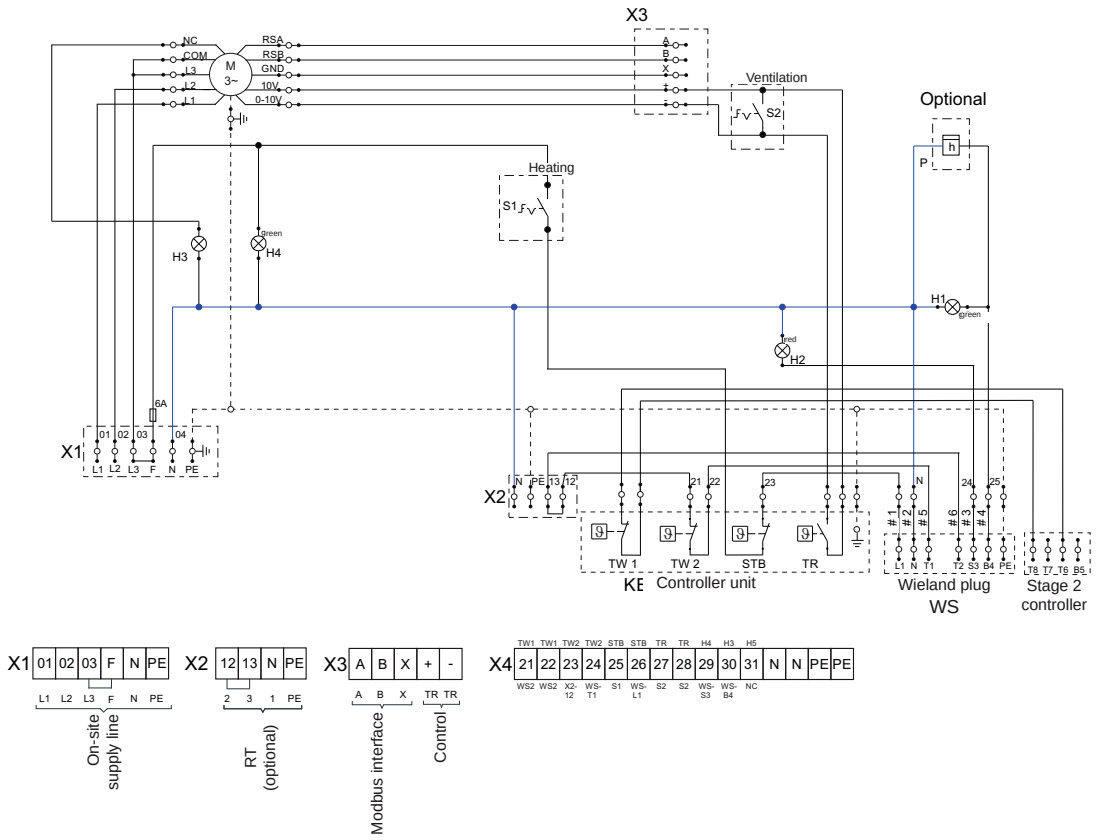
This must be protected against damage and unauthorised use!

**⚠ CAUTION**

*The electrical unit connection must only be carried out by authorised specialist personnel in accordance with the specifications of the local power supplier.*

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

# Electrical wiring diagram 400 V




**Legend:**

F = Fuse, 6A
H1 = Heating indicator lamp (in the switch)
H2 = Ventilate indicator lamp (in the switch)
H3 = Burner operating lamp
H4 = Burner fault lamp
H5 = Fan operating lamp
H6 = Phase indicator lamp
KB = Controller unit
M = Fan motor
P = Operating hours counter (optional)

RT = Room thermostat or regulation (optional)
S1 = Heating selector switch
S2 = Ventilate selector switch
STB = Safety thermal cut-out
TR = Fan controller
TW = Temperature monitoring device
X1 = Connection terminals supply line
X2 = Connection terminals room thermostat
X3 = Fan controller connection terminals

An emergency switch must be installed in an easily accessible place in the installation room (but outside any possible hazard zone).

This must be protected against damage and unauthorised use!

**⚠ CAUTION**

*The electrical unit connection must only be carried out by authorised specialist personnel in accordance with the specifications of the local power supplier.*

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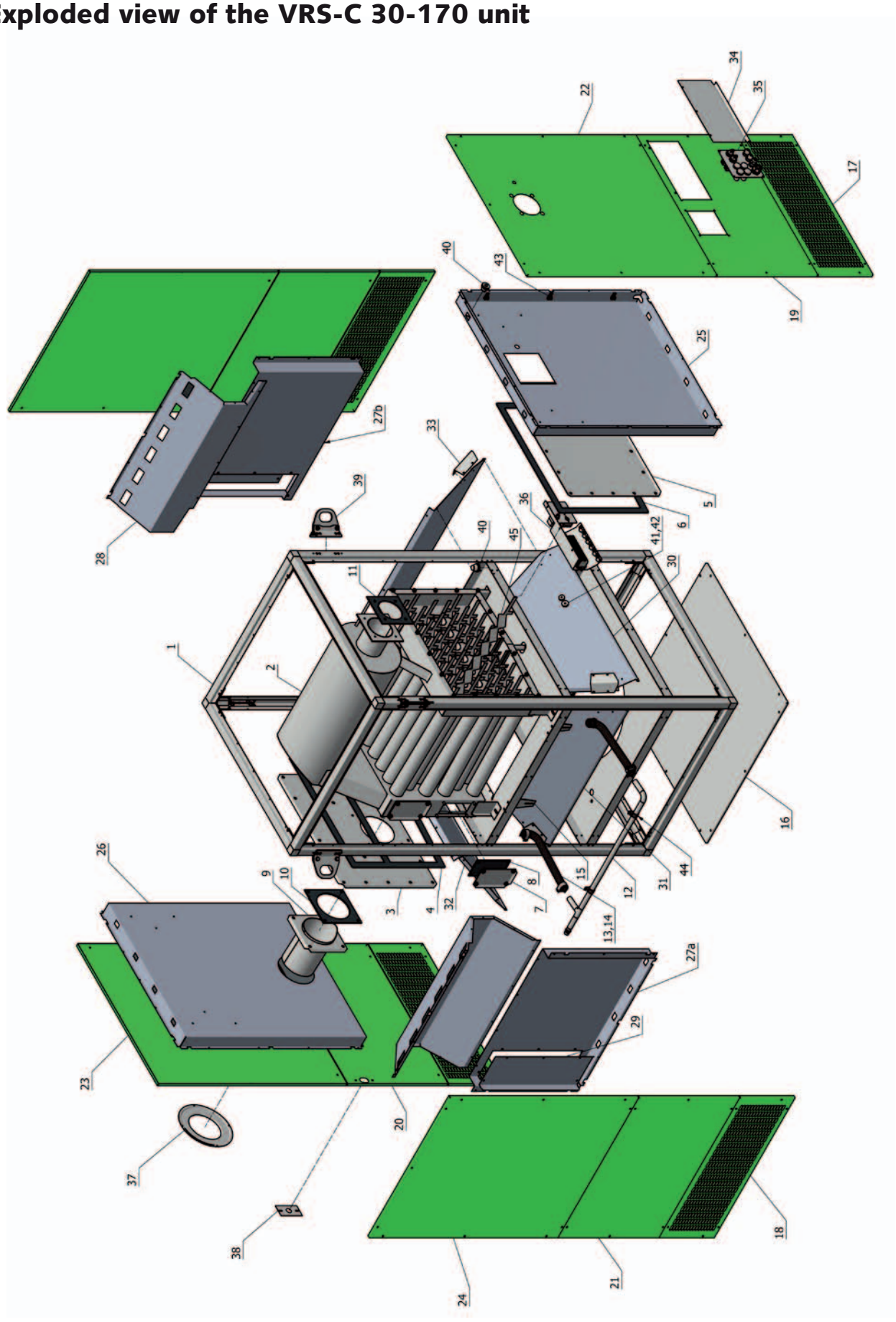
# REMKO VRS-C Series

## Exploded view of the VRS-C 30-170 unit




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

## Spare parts list

| Item | Designation | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|---|
| | | EDP no. | EDP no. | EDP no. | EDP no. | EDP no. | EDP no. | EDP no. |
| 1 | Frame | 1125913 | 1125914 | 1125915 | 1125916 | 1125916 | 1125917 | 1125918 |
| 2 | Combustion chamber, compl. | 1125919 | 1125920 | 1125921 | 1125922 | 1125922 | 1125923 | 1125924 |
| 3 | Rear inspection cover | 1125925 | 1125926 | 1125927 | 1125928 | 1125928 | 1125929 | 1125930 |
| 4 | Seal, rear inspection cover | 1125931 | 1125932 | 1125933 | 1125934 | 1125934 | 1125935 | 1125936 |
| 5 | Front inspection cover | 1125937 | 1125938 | 1125939 | 1125940 | 1125940 | 1125941 | 1125942 |
| 6 | Seal, front inspection cover | 1125943 | 1125944 | 1125945 | 1125946 | 1125946 | 1125947 | 1125948 |
| 7 | Lateral inspection cover | 1125949 | 1125950 | 1125950 | 1125950 | 1125950 | 1125950 | 1125950 |
| 8 | Seal, lateral inspection cover | 1125951 | 1125952 | 1125952 | 1125952 | 1125952 | 1125952 | 1125952 |
| 9 | Exhaust gas nozzles | 1125953 | 1125954 | 1125954 | 1125955 | 1125955 | 1125955 | 1125955 |
| 10 | Exhaust gas nozzle seal | 1125956 | 1125957 | 1125957 | 1125958 | 1125958 | 1125958 | 1125958 |
| 11 | Seal, burner flange | 1125959 | 1125959 | 1125959 | 1125960 | 1125960 | 1125960 | 1125960 |
| 12 | Condensate drain, complete | 1125961 | 1125961 | 1125961 | 1125962 | 1125962 | 1125962 | 1125963 |
| 13 | Condensate hose, 22 mm, m | 1125964 | 1125964 | 1125964 | 1125964 | 1125964 | 1125964 | 1125964 |
| 14 | Condensate hose clamp | 1125965 | 1125965 | 1125965 | 1125965 | 1125965 | 1125965 | 1125965 |
| 15 | Bracket, condensate hose | - | - | 1125966 | 1125966 | 1125966 | 1125966 | 1125966 |
| 16 | Base plate | 1125967 | 1125967 | 1125968 | 1125969 | 1125969 | 1125969 | 1125970 |
| 17 | Air intake panel, front/rear | 1125971 | 1125971 | 1125972 | 1125972 | 1125972 | 1125972 | 1125972 |
| 18 | Air intake panel, left/right | 1125972 | 1125972 | 1125972 | 1125973 | 1125973 | 1125973 | 1125974 |
| 19 | Cladding panel, bottom, front | 1125975 | 1125975 | 1125976 | 1125977 | 1125977 | 1125978 | 1125979 |
| 20 | Cladding panel, bottom, rear | 1125980 | 1125980 | 1125981 | 1125982 | 1125982 | 1125983 | 1125984 |
| 21 | Cladding panel, bottom, side | 1125985 | 1125985 | 1125986 | 1125987 | 1125987 | 1125988 | 1125989 |
| 22 | Cladding panel, top, burner side | 1125990 | 1125991 | 1125992 | 1125993 | 1125993 | 1125994 | 1125995 |
| 23 | Cladding panel, top, exhaust side | 1125996 | 1125997 | 1125998 | 1125999 | 1125999 | 1126000 | 1126001 |
| 24 | Cladding panel, top, side | 1126002 | 1126003 | 1126004 | 1126005 | 1126005 | 1126006 | 1126007 |
| 25 | Insulation panel, front | 1126008 | 1126009 | 1126010 | 1126011 | 1126011 | 1126012 | 1126013 |
| 26 | Insulation panel, rear | 1126014 | 1126015 | 1126016 | 1126017 | 1126017 | 1126018 | 1126019 |
| 27a | Insulation panel, left | 1126020 | 1126022 | 1126024 | 1126026 | 1126026 | 1126028 | 1126030 |
| 27b | Insulation panel, right | 1126021 | 1126023 | 1126025 | 1126027 | 1126027 | 1126029 | 1126031 |
| 28 | Air baffle, top, side | 1126032 | 1126032 | 1126033 | 1126034 | 1126034 | 1126035 | 1126036 |
| 29 | Cover, inspection opening | 1126037 | 1126038 | 1126039 | 1126040 | 1126040 | 1126041 | 1126042 |
| 30 | Air baffle, fan, front | 1126043 | 1126043 | 1126044 | 1126045 | 1126045 | 1126045 | 1126046 |
| 31 | Air baffle, fan, side | 1126047 | 1126047 | 1126048 | 1126049 | 1126049 | 1126049 | 1126050 |
| 32 | Air baffle, fan, rear | 1126051 | 1126051 | 1126052 | 1126053 | 1126053 | 1126053 | 1126054 |
| 33 | Angle brackets, air baffle | 1126055 | 1126055 | 1126055 | 1126056 | 1126056 | 1126056 | 1126057 |
| 34 | Cover, control box | 1126058 | 1126058 | 1126058 | 1126058 | 1126058 | 1126058 | 1126058 |
| 35 | Control panel, without components | 1126059 | 1126059 | 1126059 | 1126059 | 1126059 | 1126059 | 1126059 |
| 36 | Mounting bracket, control box | 1126060 | 1126060 | 1126060 | 1126060 | 1126060 | 1126060 | 1126060 |
| 37 | Exhaust gas nozzle collar | 1126061 | 1126061 | 1126061 | 1126062 | 1126062 | 1126062 | 1126062 |
| 38 | Cover, condensate drainage connection | 1126063 | 1126063 | 1126063 | 1126063 | 1126063 | 1126063 | 1126063 |
| 39 | Crane lugs | 1126064 | 1126064 | 1126064 | 1126064 | 1126064 | 1126064 | 1126064 |
| 40 | Cable gland, sensors | 1126065 | 1126065 | 1126065 | 1126065 | 1126065 | 1126065 | 1126065 |
| 41 | Cable gland, fan 8-14 | 1126066 | 1126066 | 1126066 | 1126066 | 1126066 | 1126066 | 1126066 |
| 42 | Cable gland, fan 7-10 | 1126067 | 1126067 | 1126067 | 1126067 | 1126067 | 1126067 | 1126067 |
| 43 | Fastening, sensors | 1126068 | 1126068 | 1126068 | 1126068 | 1126068 | 1126068 | 1126068 |
| 44 | Fastening, condensate pipe | 1126069 | 1126069 | 1126069 | 1126069 | 1126069 | 1126069 | 1126069 |
| 45 | Flue gas brakes, set | 1126070 | 1126070 | 1126070 | 1126073 | 1126073 | 1126073 | 1126076 |

When ordering spare parts, please state the EDP number, the unit type and serial number (see name plate)!

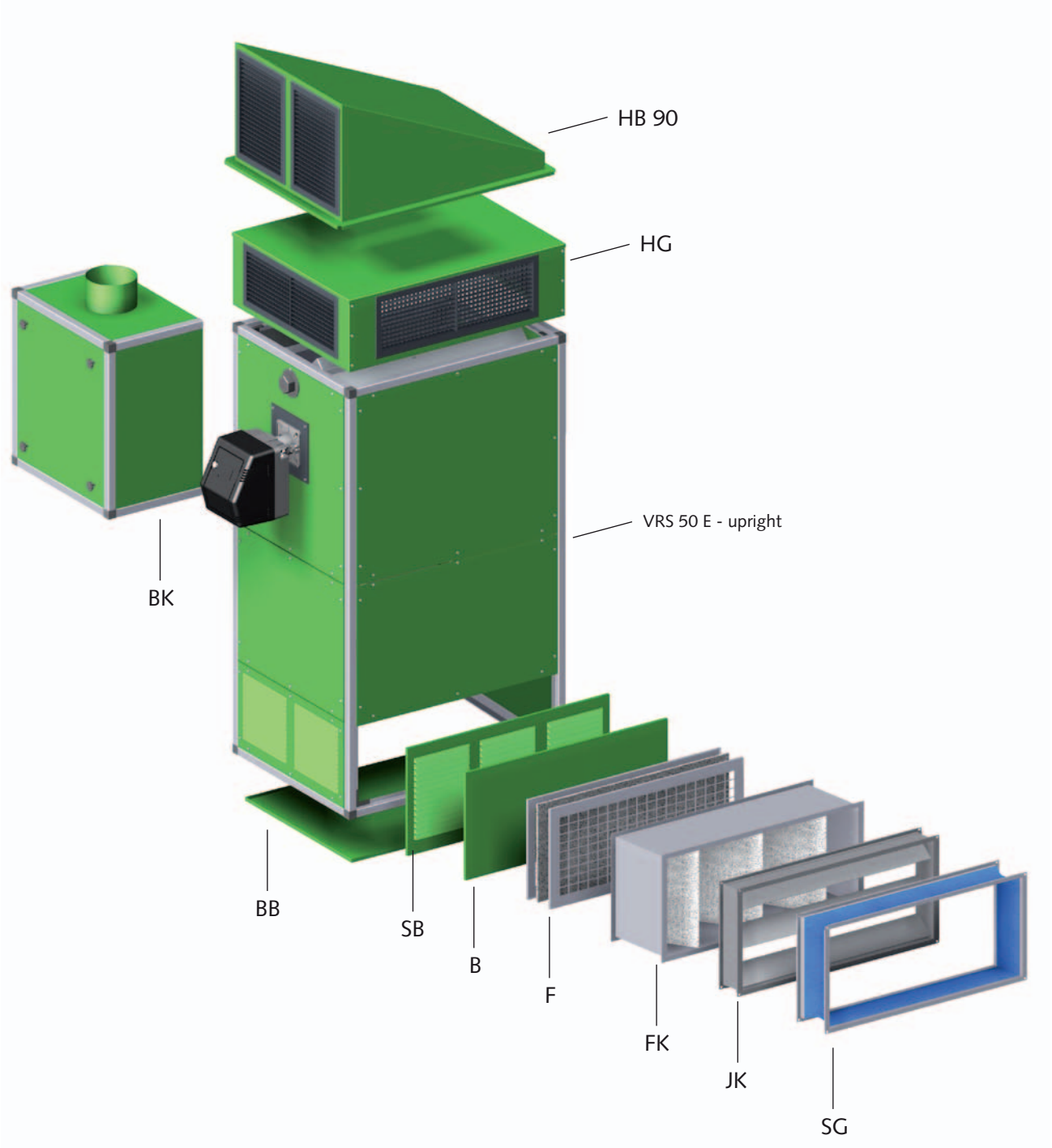
# REMKO VRS-C Series

## Spare parts list (continued)

| Designation | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| Spare parts not illustrated | **EDP no.** | **EDP no.** | **EDP no.** | **EDP no.** | **EDP no.** | **EDP no.** | **EDP no.** |
| **Fan, complete** | **Depending on the respective device version and device compression** | | | | | | |
| Safety limiter (STB) | 1101197 | 1101197 | 1101197 | 1101197 | 1101197 | 1101197 | 1101197 |
| FAN controller (TR) | 1103166 | 1103166 | 1103166 | 1103166 | 1103166 | 1103166 | 1103166 |
| Temperature monitor (TW1/TW2) | 1103146 | 1103146 | 1103146 | 1103146 | 1103146 | 1103146 | 1103146 |
| Burner connector (7-pole) | 1102537 | 1102537 | 1102537 | 1102537 | 1102537 | 1102537 | 1102537 |
| Burner connector (4-pole) | 1108585 | 1108585 | 1108585 | 1108585 | 1108585 | 1108585 | 1108585 |

When ordering spare parts, please state the EDP number, the unit type and serial number (see name plate)!

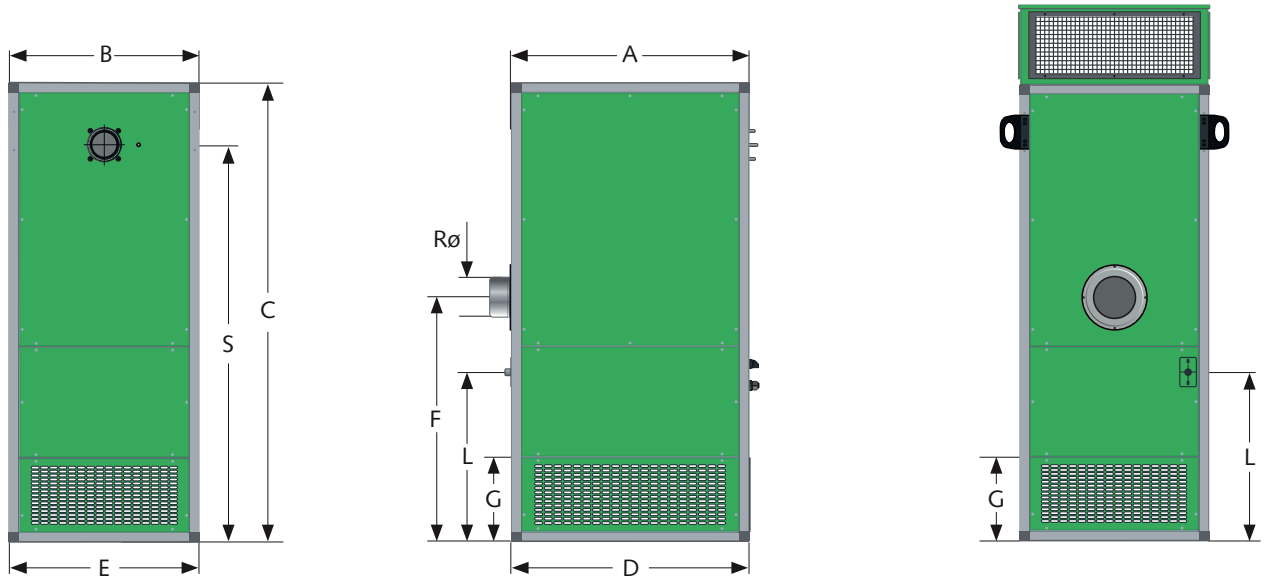
## **Unit specifications -** upright




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

# REMKO VRS-C Series

## Unit dimensions

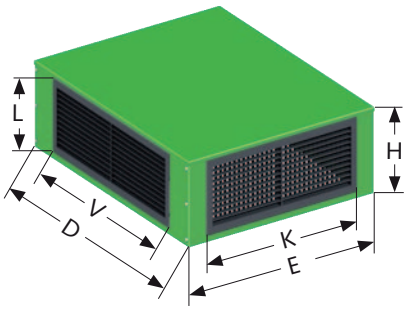



| Measurements mm | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| **A** | 904 | 904 | 904 | 1206 | 1206 | 1206 | 1306 |
| **B** | 721 | 721 | 904 | 904 | 904 | 904 | 904 |
| **C** | 1595 | 1744 | 1843 | 1935 | 1935 | 2135 | 2345 |
| **D** | 830 | 830 | 830 | 1132 | 1132 | 1132 | 1232 |
| **E** | 647 | 647 | 830 | 830 | 830 | 830 | 830 |
| **F** | 903 | 932 | 1030 | 1072 | 1072 | 1152 | 1359 |
| **G** | 282 | 282 | 282 | 282 | 282 | 282 | 282 |
| **L** | 643 | 643 | 730 | 749 | 749 | 791 | 992 |
| **R ø** | 148 | 148 | 148 | 179 | 179 | 179 | 179 |
| **S** | 1360 | 1508 | 1605 | 1655 | 1655 | 1853 | 2060 |
| **Weight kg** | 205 | 235 | 280 | 360 | 360 | 410 | 465 |

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

# Accessories

## Exhaust hood type HG



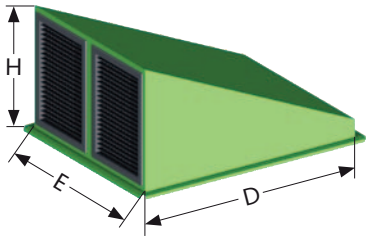

For direct exhaust to 2, 3 or 4 sides with built-in air directing louvres. All louvres are individually adjustable both horizontally and vertically.

| Measurements mm | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| D | 905 | 905 | 905 | 1207 | 1207 | 1207 | 1307 |
| E | 722 | 722 | 905 | 905 | 905 | 905 | 905 |
| H | 303 | 303 | 303 | 303 | 303 | 303 | 303 |
| L | 260 | 260 | 260 | 260 | 260 | 260 | 260 |
| V | 751 | 751 | 751 | 1052 | 1052 | 1052 | 1251 |
| K | 651 | 651 | 751 | 751 | 751 | 751 | 751 |

| Casting distance in metres | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| front + rear | 16 | 16 | 32 | 35 | 35 | 32 | 36 |
| right + left | 15 | 14 | 29 | 33 | 33 | 29 | 31 |

The specifications are always based on the respective specified positions only.

## Exhaust hood type HB-90

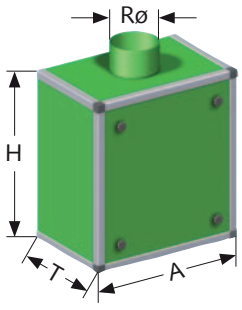



For direct exhaust to the front or rear, with built-in air directing louvres. All louvres are individually adjustable both horizontally and vertically.

| Measurements mm | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| D | 855 | 855 | 855 | 1157 | 1157 | 1157 | 1257 |
| E | 672 | 672 | 855 | 855 | 855 | 855 | 855 |
| H | 405 | 405 | 405 | 705 | 705 | 705 | 705 |

| Casting distance in metres | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| front + rear | 18 | 19 | 29 | 30 | 31 | 35 | 37 |

## Burner box type BK




With connection nozzles for piping to the outside air intake of the combustion air. This is also recommended for installation rooms with a high dust content or possible air shortage.
The positioning of the connection nozzle can take place on any of the four side positions.

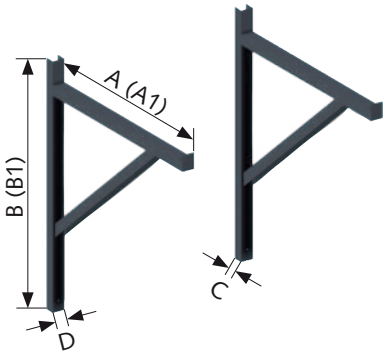
| Measurements mm | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| A | 721 | 721 | 904 | 904 | 904 | 904 | 904 |
| H | 610 | 610 | 670 | 670 | 670 | 670 | 670 |
| Rø | 149 | 149 | 149 | 149 | 149 | 149 | 149 |
| T | 385 | 385 | 435 | 435 | 435 | 435 | 435 |

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

# REMKO VRS-C Series

## Accessories

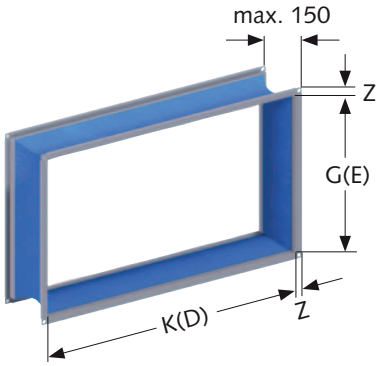
### Wall bracket type KN




U-profile design for the fastening of upright or horizontal units to the wall.
Fastening only to walls at least 24 cm thick (check statics).
End-to-end M16 threaded pins with profiled steel on the underside should ideally be used (customer-provided fastening material).

| Measurements mm | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| A | 790 | 790 | 974 | 974 | 974 | 974 | 974 |
| B | 928 | 928 | 1100 | 1100 | 1100 | 1100 | 1100 |
| C | 50 | 50 | 65 | 65 | 65 | 65 | 65 |
| D | 75 | 75 | 95 | 95 | 95 | 95 | 95 |

### Elastic nozzle type SG




Flexible connection (vibration damping) between unit and air duct system.
Installation possibility, Pos. I, II, III, IV or even combined.

| Measurements mm | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| **D** (Pos I-II) | 607 | 607 | 790 | 790 | 790 | 790 | 790 |
| **E** (Pos I-II) | 242 | 242 | 242 | 242 | 242 | 242 | 242 |
| **K** (Pos III) | 790 | 790 | 790 | 1092 | 1092 | 1092 | 1192 |
| **G** (Pos III) | 242 | 242 | 242 | 242 | 242 | 242 | 242 |
| **Z** | 20 | 20 | 20 | 20 | 20 | 20 | 20 |

### Dust filter type F for free intake

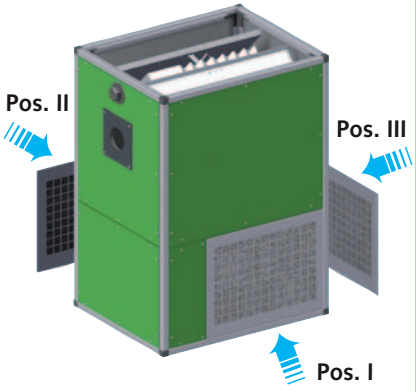



Plate filter comprised of two grating frames with intermediate, easily replaceable filter mats with the filter class G3.

Additional filter classes are also available on request.

1 dust filter F set always consists of intake Pos. I + II + III.

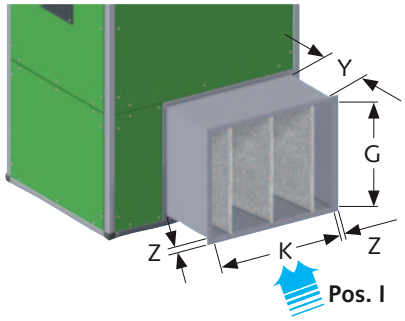
| Technical data | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| **F m²** | 0.60 | 0.60 | 0.70 | 0.79 | 0.79 | 0.79 | 0.82 |
| **A m/s** | 1.9 | 2.6 | 2.7 | 2.6 | 3.0 | 3.7 | 4.3 |

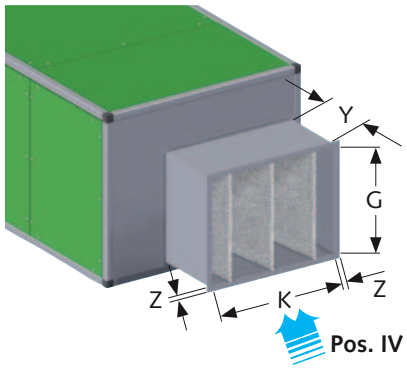
F m² = Filter surface in m²
A m/s = Flow in m/s
Starting pressure loss approx. 100 Pa with standard pressure.
With a change in filter class, the changed pressure loss must be taken into account!

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

# Accessories

**Dust filter type FK** for duct intake




Duct filters with easily replaceable plug-in filters with filter class G3. Additional filter classes are also available on request.

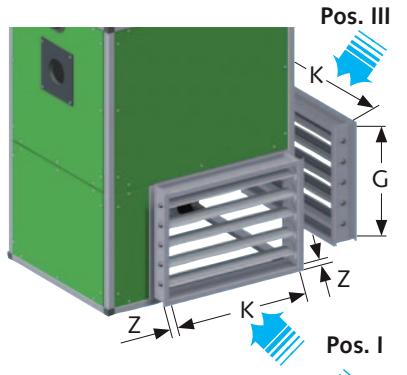
Any potentially remaining intake openings are to be closed with corresponding blank panels.

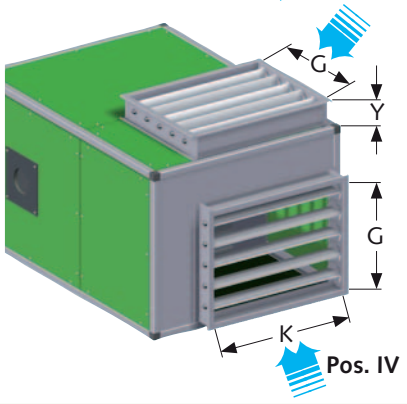
| Measurements mm | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| **G** (Pos I-II) | 607 | 607 | 790 | 790 | 790 | 790 | 790 |
| **K** (Pos I-II) | 242 | 242 | 242 | 242 | 242 | 242 | 242 |
| **G** (Pos III) | 790 | 790 | 790 | 1092 | 1092 | 1092 | 1192 |
| **K** (Pos III) | 242 | 242 | 242 | 242 | 242 | 242 | 242 |
| **Y** | 480 | 480 | 480 | 480 | 480 | 480 | 480 |
| **Z** | 20 | 20 | 20 | 20 | 20 | 20 | 20 |

| Technical data | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| **F m²** | 0.60 | 0.60 | 0.70 | 0.79 | 0.79 | 0.79 | 0.82 |
| **A m/s** | 1.9 | 2.6 | 2.7 | 2.6 | 3.0 | 3.7 | 4.3 |

F m² = Filter surface in m²
A m/s = Flow in m/s
Starting pressure loss approx. 100 Pa with standard pressure and 2-sided intake.
With a change in filter class, the changed pressure loss must be taken into account!

**Louvre dampers type JK**




Louvre dampers in galvanised steel sheet housing with connection frame. The torsion-resistant aluminium slats can be seamlessly adjusted by means of a manual lever or electric louvre adjustment motor (accessory). Combined louvres for the regulation of the recirculated/outside air ratio are connected with a perpendicular rod.

**Combination possibilities:**
Pos. I + II
Pos. I + III
Pos. II + III

Any potentially remaining intake openings are to be closed with corresponding blank panels.

| Measurements mm | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|
| **G** (Pos I-II) | 607 | 607 | 790 | 790 | 790 | 790 | 790 |
| **K** (Pos I-II) | 242 | 242 | 242 | 242 | 242 | 242 | 242 |
| **G** (Pos III) | 790 | 790 | 790 | 1092 | 1092 | 1092 | 1192 |
| **K** (Pos III) | 242 | 242 | 242 | 242 | 242 | 242 | 242 |
| **Y** | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| **Z** | 20 | 20 | 20 | 20 | 20 | 20 | 20 |

# REMKO VRS-C Series

## Technical data

| Series | Symbol | Unit | VRS-C 30 | VRS-C 50 | VRS-C 70 | VRS-C 100 | VRS-C 120 | VRS-C 150 | VRS-C 170 |
|---|---|---|---|---|---|---|---|---|---|
| Nominal thermal load | $\dot{Q}_N$ | kW | 35 | 60 | 77 | 104 | 121 | 153 | 183 |
| Nominal heat capacity | $P_{rated,h}$ | kW | 32 | 57 | 73 | 94 | 111 | 139 | 165 |
| Nominal flow rate[1)] | $\dot{V}_{nom}$ | $m^3/h$ | 4000 | 5600 | 6800 | 7300 | 8500 | 10400 | 12200 |
| Fuel | | | EL heating oil, diesel fuel, B7/B10 biodiesel, HVO biofuel, natural or liquid gas | | | | | | |
| Oil flow rate (EL heating oil) | | kg/h | 2.7 | 4.8 | 6.1 | 8.2 | 9.6 | 12.1 | 14.5 |
| Gas flow rate (natural gas H) | | $m^3/h$ | 3.1 | 5.3 | 6.7 | 9.1 | 10.6 | 13.4 | 16.0 |
| Gas flow rate (natural gas L) | | $m^3/h$ | 3.6 | 6.1 | 7.9 | 10.7 | 12.4 | 15.7 | 18.8 |
| Gas flow rate (liquid gas) | | $m^3/h$ | 1.3 | 2.2 | 2.8 | 3.8 | 4.4 | 5.5 | 6.6 |
| Gas flow rate (liquid gas) | | kg/h | 2.5 | 4.3 | 5.5 | 7.4 | 8.6 | 10.9 | 13.1 |
| Flue gas flow [2)] | $\dot{m}_{Af}$ | kg/h | 49.1 | 84.2 | 108.1 | 146.0 | 169.9 | 214.8 | 257 |
| Exhaust gas temperature, approx.[3)] | $t_w$ | °C | 60 - 150 | | | | | | |
| Flue-gas side resistance | | Pa | 5 | 16 | 10 | 12 | 18 | 20 | 50 |
| Nitrogen oxide emissions (HEL) | $NO_x$ | mg/kWh | 100 | 93 | 132 | 94 | 111 | 120 | 130 |
| Nitrogen oxide emissions (EGH) | $NO_x$ | mg/kWh | 70 | | | | | | |
| Power supply | U | V/Ph/Hz | 230/1~/50 | | 400/3~N / 50 | | | | |
| Current consumption without fan | el | kW | 0.300 | 0.363 | 0.400 | 0.504 | 0.537 | 0.502 | 0.582 |
| Current consumption, fan | el, V | kW | 0.350 | 0.750 | 0.900 | 1.200 | 1.500 | 1.900 | 2.800 |
| Current consumption | I | A | 2.826 | 4.839 | 3.038 | 3.923 | 4.500 | 4.925 | 6.570 |
| Exhaust gas connection ø | | mm | 150 | | | | 180 | | |
| Weight [4)] | | kg | | | | | | | |



REMKO GmbH & Co. KG
Klima- und Wärmetechnik
Im Seelenkamp 12
32791 Lage
Telephone +49 (0) 5232 606-0
Telefax +49 (0) 5232 606-260
E-mail info@remko.de
URL www.remko.de
Hotline within Germany
+49 (0) 5232 606-0
Hotline international
+49 (0) 5232 606-130

1) air flow at t 20 °C / 1.2 kg/m³
2) approx. quantity with oil operation
3) measured temperature minus room temperature
4) with standard design, without burner and other accessories

**max. intake temperature 40°C / max. exhaust temperature 100°C**

### Gross calorific values $H_s$ in standard condition:

| | | |
|---|---|---|
| EL heating oil | 12.61 | kWh/kg |
| Natural gas H | 11.48 | kWh/m³ |
| Natural gas L | 9.75 | kWh/m³ |
| Propane gas | 28.14 | kWh/m³ |
| Propane gas | 14.00 | kWh/kg |

### Additional specifications for fresh air and flue gas ducting

The following applies to all models in the VRS-C series:

| | |
|---|---|
| $B_1$-air heater: | no |
| $C_2$-air heater: | no |
| $C_4$-air heater: | no |

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

# **REMKO** QUALITY WITH SYSTEMS

Air-Conditioning | Heating | New Energies


**REMKO GmbH & Co. KG**
**Klima- und Wärmetechnik**

Im Seelenkamp 12
32791 Lage

Telephone +49 (0) 5232 606-0
Telefax +49 (0) 5232 606-260

E-mail info@remko.de
URL www.remko.de

**Hotline within Germany**
+49 (0) 5232 606-0

**Hotline International**
+49 (0) 5232 606-130