

User Manual

Version 2.02 / 11.05.04

VANVEX RS
Domestic Hot Water Heat Pump

Operating system
OPTIMA 160

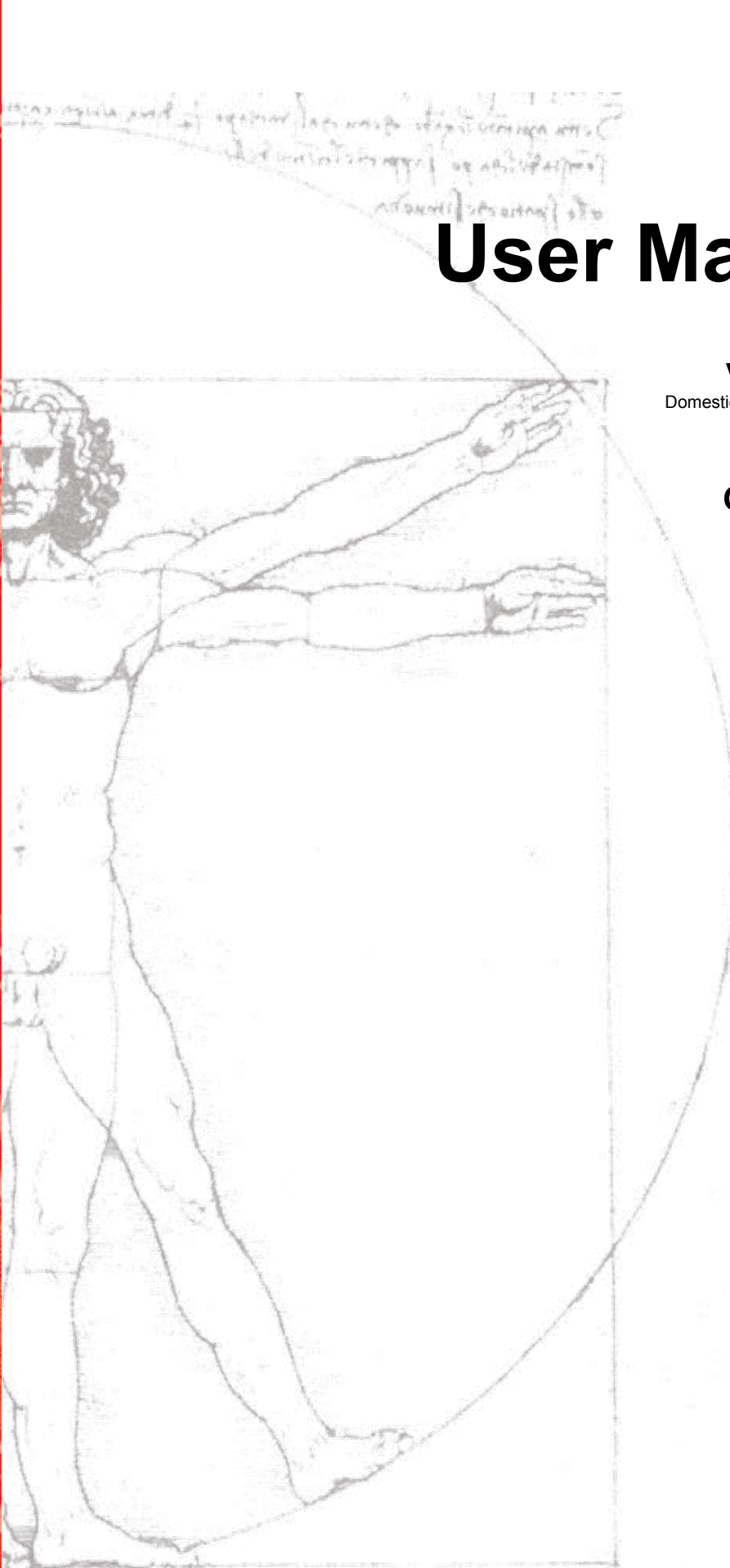


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1. Users guide

Optima 160 comes with a factory setup, which enables an immediate start of the unit. The factory setup is basic and must be adjusted to the operational requirements and demands of the individual home, in order to obtain the optimum operating benefit from the unit.

1.1 Use



Users menu

The value of a menu item is shown when pressing the key/key combination below. The value may be changed with the arrows when the key/key combination is held down simultaneously. The control will return to standard indication if no buttons have been pressed for app. 15 seconds.

P1: Step

(The step key is pressed)

On this key it is possible to switch between: standby, automatic operation, constant operation and timer controlled constant operation (level 0, level 1, level 2, level 3).

- Level 0: The heat pump is now turned off and only the control is active.
- Level 1: The fan only runs when domestic water is heated. (1. priority)
- Level 2: The fan continues running after the compressor has stopped, providing extract ventilation. (E18)
- Level 3: The fan runs in a chosen period of time, before it switches back to normal operation.

Factory setting: 1.

P2: Electrical element ON

(The electrical element key is pressed)

The heat pump is supplied with an extra heating element for heating the domestic water. On this signal key it is possible to switch on the electrical element for heating the domestic water. By adjusting the set point to 1 the electrical element will turn on whenever needed. By adjusting the set point to 0, the electrical element will not turn on if needed. At an outdoor temperature below 0°C it is an advantage to use the electric element.

Factory setting: 0 C°.

P3: Operating thermostat

The operating thermostat is pressed

The required domestic water temperature may be set between 0-55°C, which is heated by the heat pump.

Factory setting: 50°C.

P4: Stop defrosting

(The level and operating thermostat buttons are pressed simultaneously)



As a standard setting, the defrost period ends when the temperature of the evaporator has reached 10°C.

During extraordinary operating conditions it may be necessary to change this temperature.

The temperature can be set between 0-25°C.

Factory setting: 10°C.

P5: The electrical element

(The electrical element and the operating thermostat keys are pressed simultaneously)



The domestic water temperature can be set between 0-65°C. The electric heating element solely heats the top half of the container, while the heat pump still heats the lower half of the container.

Factory setting: 50°C.

Display indication

It is possible to view various temperatures in the display, by pressing the arrows until the required temperature has been shown. After app. 5 seconds, the temperature is shown. The temperature is shown for app. 30 seconds until the display returns to standard. Following temperatures may be shown:

T4: Extra sensor for free use or forced operating input

T5: Pre cooling surface

T6: Cooling surface

T7: Domestic water top



T8: Domestic water bottom







T9: Extra sensor

1.2 Altering of the operation data

Usually, the display shows the water temperature.



Press  (arrow up) and  (arrow down) simultaneously for app. 10 seconds in order to enter the operating menu. To show the chosen value press. The display will now show the first point **E0** in the operating menu. The operating menu will close and return to the main menu if a button has not been pressed for 15 sec.

If you wish to scroll through the operating menu, it may be done by pressing  (arrow up) and  (arrow down). The value of a point is shown when pressing  (temp button). The value may be changed with the  (arrow up) and  (arrow down), while simultaneously pressing  (temp button).

The control will return to standard indication if no buttons have been pressed for app. 15 seconds.

1.3 Operating menu

E0: Factory default

If the system does not function as expected, even though the set-points have been adjusted, and the cause is impossible to locate, it is recommended to note down the settings in the schedule. Thereafter, the setpoint must be adjusted to 1 and wait until the control returns to standard settings. Now all the set points have been changed to the factory default.

It is now possible to start all over and adjust the set points.

Factory setting: 0.

E2: T9 set temperature

This sensor is able to control the relay R9, which will be activated when the setpoint E2 is reached. The R9 relay can be used to control the three way damper of the exhaust air. This three way damper can supply the living area with cool air, if the room temperature reaches the setpoint E2. For this function you will need a separate sensor, which is not a within the standard delivering.

E2 can be set between 0-30°C.

Factory setting: 21 °C.

E8: Disinfection function ON/OFF

By setting the point to 1 (ON), the electric heating element will provide 65°C hot water once a week in order to disinfect the tank (legionella protection function), also although E2 is set to 0 (OFF).

E8 can be set between 0-1.

Factory setting: 0.

E9: Operating in cold surroundings ON/OFF

- **The value 0 = OFF**, if the temperature of the air gets lower than the value entered under point E10 (0°C), the compressor switches off and the heating element is automatically connected.
- **The value 1 = ON**, if the temperature of the air gets lower than the value entered under point E10 (0°C), the compressor does not switch off, but the heating element is automatically connected

E9 can be set between 0-1.

Factory setting: 0.

E10: Operating in cold surroundings

When activating the function menu E9, the temperature at which the compressor will stop or the electrical heat element will assist, may be set.

E10 can be set between -5°C og 10°C.

Factory setting: 0.

E13: Under floor min. Temp (Only Vanvex RS)

With this setting the minimum tank temperature is set, which will allow heat to be delivered to the under floor heating circuit.

E13 can be set between 20-50°C.

Factory setting: 35°C.

E15: Hygrostat / stop unit

If the value is 0 the speed of the fans will change to 3 when the relative humidity is above the preset value of the hygrostat. If the value is 1 the unit will stop when the clips 25 and 26 are short circuiting.

E15 can be set between 0-1.

Factory setting: 0.

E16: Min. air flow

This value shows the minimum speed at which the fan is permitted to run when operating. Notice that the cooling system may be overloaded, resulting in a drop out of the high pressure switch, if the value has been set too high. The value should not be chosen higher than necessary in order to secure a minimal airflow through the cooling surface.

E16 can be set between 0-100%.

Factory setting: 0 %.

E17: Forced ON

At 3rd speed there is an option of making the unit step down automatically to the 2nd speed after a number of hours by adjusting to set 1. If the set point is adjusted to 0, the unit will run at the 3rd speed until a lower speed has been selected manually.

E17 can be set between 0-1.

Factory setting: 0

E18: Hours

If automatic step-down at 3rd speed is in use, the number of hours at which the unit is to operate with forced air, may be adjusted here.

E17 can be set between 0-10 hours.

Factory setting: 3.

E19: Extra Function

With this function it is possible to activate Vanvex R for cooling or to ensure a min. supply temperature by a mix. function. It is also possible to use the Vanvex RS with solar or floor heating.

If the set point is 1 the extra function will be activated as soon as T9 reaches the setpoint (E2).

If the set point is 0 the function will not be active.

E19 can be set between 0-6.

0. The function is deactivated
1. The solar collector is activating the solar pump which is commanded from E2 and E20 and runs independent from the heat pump (Only Vanvex RS).
2. The floor heat runs independent from the heat pump which is commanded from E2 and E13 (Only Vanvex RS).
3. The solar collector is activating the solar pump which is commanded from E2 and E20 and switch off the heat pump. After the circulation pump has been switch off it will take 30 minutes until the heat pump again is activated (Only Vanvex RS).
4. The cooling function is activating a three way damper which lead the cold air into needed rooms. It is commanded from E2 and T9.
5. The mix function is activating a three way damper which is mixing warm air with cold air. It is commanded from E2 and T9.
6. If the compressor is ON, the relay and the compressor is in operation.

Factory setting: 0.

E20: Solar col hyst

If a solar collector has been connected, a temperature difference may be set, this must be between the water temperature in the solar collector (T9) and the operating thermostat of the hot water tank (T8), before the solar pump of the solar collector is running.

E20 can be set between 1 and 5°C.

Factory setting: 5 °C.

E21: TX set

In order to avoid too high operating pressures in the cooling system, the system output must be reduced for the remaining part of the heating period. This parameter indicates the water temperature at which the reduction should start.

E21 can be set between 0-55 C°.

Factory setting: 45.

E23: Tmop

This value indicates the maximum permitted evaporation temperature. This prevents overloading of the cooling system at high ambient temperatures.

E23 can be set between 0-30 C°.

Factory setting: 25°C.

E25: Vent level 2

If an extended period of extraction from the building is wanted, it is possible to change to level 2. The fan will now run, until another level has been selected. This option is used to set the speed at which the fan should run, when level 2 is selected. Please note that this setting also sets the maximum fan speed when running in level 1.

E25 can be set between 0-100%.

Factory setting: 100 %.

E26: Vent level 3

If extraction from the building at a specific length of time is required, it is possible to change to level 3. The fan will now run for the set period. Thereafter, the system will return to level 2. This menu option is used to specify the speed at which the fans should run when the set period has been chosen. Please note that this setting also sets the maximum fan speed when running in level 1.

E26 can be set between 0-100%.

Factory setting: 100%.

E45: dTair-set

Here it is possible to choose minimum cooling of the air, while heating the water. The control will adjust the speed of the fan to make sure that the air will be cooled at the exact temperature chosen. In case the control, due to technical reasons, needs to cool the air, the value will be controlled by the automatic function. When requiring a higher fan speed, the value may be reduced. Remember though, the fan will run faster, using more energy, if the values are set to low.

E45 can be set between 1 og 15 °C.

Factory setting: 2°C.

E46: Max. boilertemperature

To avoid to high temperature in the boiler by use of solar or another heat source, the temperature have to be set at the max. allowed temperature in the bottom of the boiler.

E45 can be set between 40°C og 70°C.

Factory setting: 60 °C.

E49: Screensaver (0-2)

Choose which kind of screensaver you want:

0: None

1: Water temperature

2: Watch

Factory setting: 0.

E50: Watch setup (0-23)

Here it is possible to choose the hours for the domestic hot water heat pump watch.

Factory setting: 0.

E51: Watch setup (0-59)

Here it is possible to choose the minutes for the domestic hot water heat pump watch.

Factory setting: 0.

E52: Cheap period (ON/OFF)

If the "cheap period" is ON, the heating element and the heat pump will operate in the time schedule given in set point E53 and E54. If E52 is OFF, the heating element and the heatpump will operate on demand if the adjustment allows it.

E52 can be set between 0-1.

Factory setting: OFF.

E53: Cheap period start (0-23)

Here it is possible to choose when the period should start.

Factory setting: 0.

E54: Cheap period stop (0-23)

Here it is possible to choose when the period should stop.

Factory setting: 0.

E60: Temperature difference between T5 and T6

If $T6 > (T5 + \text{value entered in E60})$ Er06 appears in the display. Er06 makes the compressor switch off. In order to reset this mistake, the unit must be shut down.

E60 can be set between 0-10°C.

The factory setting is 2°C.

1.4 Factory default table

	Factory defaults:	Date	Date
E0: Factory default	0		
E2: T9 set temperature	21		
E8: Disinfection function ON/OFF	0		
E9: Operating in cold surroundings ON/OFF	1		
E10: Operating in cold surroundings	0		
E13: Under floor min. Temp	35		
E15: Hygostat / stop unit	0		
E16: Min. air flow	0		
E17: Forced ON	0		
E18: Hours	3		
E19: Extra Function	0		
E20: Solar col hyst	5		
E21: TX-set	45		
E23: Tmp	25		
E25: Fan level 2	100		
E26: Fan level 3	100		
E45: dTair-set	2		
E46: Max boilertemperature	60		
E49: Screensaver	0		
E50: Watch setup (0-23)	0		
E51: Watch setup (0-59)	0		
E52: Cheap period (ON/OFF)	OFF		
E53: Cheap period start (0-23)	0		
E54: Cheap period stop (0-23)	0		

1.5 Defrost program

T5 before coil °C	T6 in coil °C
15°	-3°
13°	-3°
11°	-3°
9°	-4°
7°	-4°
5°	-5°
4°	-5°
3°	-6°
1°	-7°
0°	-8°
-2°	-9°
-5°	-11°

2. Function

2.1 Control Optima 160

The flow diagram in the installation manual shows the location of the sensors, while the control circuit board shows the relay outputs and the other outputs for connecting fan and control panel.

The sanitary hot water heat pump:

The hot water heat pump is only intended to produce hot tapping water for domestic use within the specified temperature limits. The sanitary hot water heat pump is a complete unit with a 285 litre hot water tank, extraction fans, heat pump and also equipped with a complete electrical equipment.

Capacity:

The sanitary hot water heat pump is capable of producing a hot water volume of app. 1000 Litres at 45°C. The actual volume depends on the supplied fresh water temperature, air temperature and the pattern of use of hot water. The additional electrical heating element (1,5 kW) may be used to boost the capacity whenever needed. The heat pump only uses app. 27% of the energy compared to a conventional electric boiler.

Heat pump operation:

The control starts the compressor shortly after hot water has been tapped. The compressor will run until the entire boiler has been heated to the set temperature again. Usually the heat pump can produce a sufficient amount of hot tapping water covering the needs of a common family.

Water heating:

When hot water is drawn off, the boiler will be refilled with cold water at the bottom. A sensor measures the temperature at the bottom of the tank and starts the compressor, if the temperature has fallen 5°C below the set temperature. The compressor stops, when the water has been heated to the set temperature. While the compressor operates, the fan runs and circulates air through the cooling surface.

Fan operation:

The fan may be set to run continuously, when the compressor has stopped - by selecting level 2 or level 3. This option may be chosen when the Vanvex R is used as an extraction system in the residential wet rooms. If the input to T4 short circuits, the control is forced to run at 3rd speed. This may be used in order to achieve more extract in e.g. the bathroom while taking a shower. When breaking the short circuit on the input pins to T4, the control will return to its previous step.

Defrosting:

When the temperature difference between the temperature in front of the cooling surface and the temperature of the cooling surface becomes too large (as happens when ice is formed on the cooling surface), the unit goes into defrost mode. The magnetic valve MA 4 opens and the supply air fan stops, until the ice has melted and the cooling surface has reached a temperature of app. 5°C (depends on the settings). Then the magnetic valve closes again and the supply air fan resumes operation.

2.2 Extra Capacity

If a situation should occur where the sanitary hot water heat pump is not capable of producing enough hot tapping water, an extra electrical heating element that is mounted in the boiler can be switched on. Doing so, it is possible to heat up more water. It is possible to set the desired temperature to which the electrical heater should heat up the water. (Only use the electrical heater when needed, as it uses more energy than the compressor). The activation of the electrical heater is done manually on the display.

2.3 Operating safety

High-pressure switch:

To prevent the compressor exceeding its range of operation, there is an integral high pressure switch, which interrupts when the pressure becomes too high. Activate the red reset button once the cause of the error has been identified. When the high pressure switch interrupts, the red Genvex logo will flash until the red reset button on the pressure switch is activated. In order to prevent a repetition of a pressure switch error, the water may be set 2-3°C lower.

Safety breaker for electrical heating element:

If an error occurs at the heater, the safety breaker trips and stops the heater in order to prevent the tank from being overheated.



When working on the heat pump, always make sure that the power supply is disconnected. Any work on this unit may only be carried out by trained personnel!

2.4 Faults

High-pressure switch:

When the pressure switch trips, the red light on the display will light, until the pressure switch is reset.

3. Maintenance

The following instructions must be followed in order to ensure optimum operation of the sanitary hot water heat pump.



The power supply to the system must always be switched off before opening the cover of the unit.

When the unit has been installed for the first time make sure the water connections are checked after a few days to make sure there are no leaks. Also check that the condensate drain pipe is not blocked.

Environmental considerations

When the unit is being serviced or its operation is cancelled, please make sure to follow the guide lines for recovery and disposal of all materials according to local procedures and laws.

3.1 Communication box

To allow Optima 160 to communicate with the computer (data logger), CTS unit, the "Genvex Datalogger" communication box must be mounted between the control panel and the computer/CTS unit. The data logger is sold by Genvex.

3.2 Cooling system

Fan:

Maintaining the fans is mainly periodically cleaning of the evaporator. Disconnect the flexible hoses from the top of the unit and unscrew the top plate. Clean the fan with a suitable brush. Do not remove the balancing blocks from the impeller, as this will cause imbalance and with it more noise and fan wear.



Risk of injury from sharp-edged fins! DO NOT damage this fins!

Condensate drain:

When cleaning the fan check the condensate drain and tray for blockage by dirt. Fill water in the condensate tray and check that the water runs out unhindered. Should this not be the case the drain must be cleaned. At the same time make sure that the plates of the evaporator are clean.

3.3 Watercircuit and boiler

Safety valve:

The installer has fitted a safety valve on the cold water supply pipe for the hot water boiler. This valve is a protection of the boiler against excess pressure when the domestic water expands during heating. The non-return valve, which is fitted before the safety valve on the cold water pipe, prevents the water from flowing back into the cold water pipe.

This means that the pressure in the tank will increase to the maximum pressure permitted by the safety valve, at which point it will open and allow the surplus water to escape. If the safety valve did not open, the boiler would burst.

To make sure that the safety valve is working properly, it should be inspected several times a year. To do this, press the spring-loaded arm on the safety valve and see if water comes out of the valve. Damage caused by a blocked safety valve is not covered by the Genvex warranty.

Anode:

In order to prevent corrosion of the enamelled hot water boiler, the boiler is fitted with a magnesium anode with a 3/4" screw plug. This anode has a life expectancy of 2-5 years. It is nevertheless important to check that the anode is intact at all times. This should be done by inspecting the anode every 2 years and replacing it if it is corroded and measures only 6-10 mm in diameter.

To inspect the anode, turn off the power supply to the system and remove the front cover. The hot water tank has to be drained before the anode can be unscrewed. To do this, turn off the cold water supply, attach a hose to the drain valve to ensure the water runs to the nearest drain. When draining the water from the boiler, turn on a hot water tap to prevent negative pressure in the boiler. When the boiler is empty, the anode can be unscrewed and inspected. When the anode has been fitted again, close the drain cock and turn the water valve supply back on to fill the boiler with water. When the boiler is full and the cover back on, the power supply can be switched on again.

3.4 Demounting

The following actions must be taken:

Disconnect the power supply to the unit and disconnect other connections. Shut off the fresh water supply valve and connect a drain hose to the drain valve in order to drain the water. While draining, a hot tap water valve should be opened to avoid under pressure in the tank.

The air duct connections are uninstalled and remaining air channels must be closed to avoid condense water entrance to the building.

4. Fault finding

The sanitary hot water heat pump is equipped with the following safety devices:

4.1 High pressure switch:

To prevent the compressor exceeding its range of application, there is an integral high pressure switch, which interrupts when the pressure becomes too high.

In case of interruptions (too high pressure) the red light in the control panel will flash and the high pressure switch will stop the heat pump. The red light lights. Restart the equipment by manually resetting the high pressure switch. **For RESET, remove the plastic stopper at the top and press the red button.**

4.2 Safety fuse for electrical water heater

The safety breaker protects the equipment against overheating during heating with the electrical heating element. The safety breaker is mounted on the electrical heating element. The sensor for the electrical heating element is in the sub pipe of the electrical heating element. If the adjusted value (90°C) is exceeded the heating coil will disconnect. It can be reconnected when the temperature is below 90°C. To do this, the power to the equipment must be off. The reset button can now be pressed.

Please notice: Be careful not to damage or tear the cables to the control.

4.3 The heat pump will not run

Please test if:

- power is connected?
- power is turned on at the wall plug?
- the temperature of the domestic water > 55°C

If this does not help locating the error, please contact your local installer or service contractor.



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As ventilation specialists, we offer a product range that covers all aspects of modern ventilation equipment, from passive ventilation units with highly effective counter current exchangers to units with integrated heat pumps that are extremely power efficient for heating or cooling. We can also provide units for ceiling mounting for installation in existing office buildings, high-rise buildings and industrial buildings.

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