IVT 490

Guide to installation, commissioning and maintenance

Article no: 9518415 Version 2.1

IVT HEAT PUMPS

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USER

TECNICAL DESCRIPTION FOR THE INSTALLER

Introduction

This guide was designed to describe the operation, connection and maintenance of the heat pump as comprehensively as possible. As far as possible, the description has been written so that it can be followed step by step.

The guide is in two parts, one for the user and one for the installer. The table of contents sets out clearly the various sections of the manual.

Warning! The Rego401 control unit contains an advanced settings level that should only be accessed by the installer. The end user must never change any settings on this level, since this might have serious consequences for the operation of the heat pump.

NOTE: The heat pump may be tilted, but never laid horizontal.

IVT 490 / ElektroStandard is a heat pump that recovers energy from the exhaust air. It is supplemented with an immersion heater in a double-shelled hot water heater.

The 490 is prepared to collect supplementary energy from, e.g. an accumulator tank, which is charged with energy from a solar collector, wood-fired boiler or the like. If you would like to know more about this please contact your supplier.

The 490 is controlled by the outdoor temperature through an outdoor temperature sensor. This is normally sufficient to achieve a comfortable indoor climate. A room sensor can also be used as a complement to the outdoor sensor (accessory). This must be activated by a service engineer.

The whole unit takes up less than half a square metre making it a lot less space demanding than tradition energy systems.

A green control lamp on the front of the unit shows that the power is on and everything is working normally. When the lamp flashes it means the system is turned off. But note that there is still power in the system.
A red control lamp indicates that something is wrong and the fault is shown in clear text on the display screen.

The whole system is controlled by a simple menu navigated by two buttons and a dial.
System status and troubleshooting are carried out using the menu tree.

The 490 model offers several options for good comfort and economy:
* Normal/Economy mode
* Holiday mode
* Tap water priority
* Extra hot water

To prevent corrosion, the cylinder is made from stainless steel and is equipped with a sacrificial anode. The sacrificial anode is maintenance free and is suitable for all types of water.

Factory assembled components
Monitoring computer, expansion vessel, pressure gauge, safety valves, circulation pump, radiator shunt, filling and draining valves.

IVT Industrier AB
November 2003

Some good advice for the user

The plant functions more efficiently if the following points are observed:

1. The ventilation is correctly adjusted to provide the heat pump with the right amount of air.

2. The air filter is kept clean. Better to clean more often than not often enough.

3. The lower the flow temperature (read on the display) and the more correct the indoor temperature, the more efficient the heat pump. For a lower indoor temperature, fine tune or change the heating curve. For a lower temperature in an individual room, adjust the radiator thermostat. The door to this room should then be kept shut.

Tips for achieving the correct indoor climate:

1. Open all radiator thermostats. Turn up the floor heating system's room thermostat to maximum.

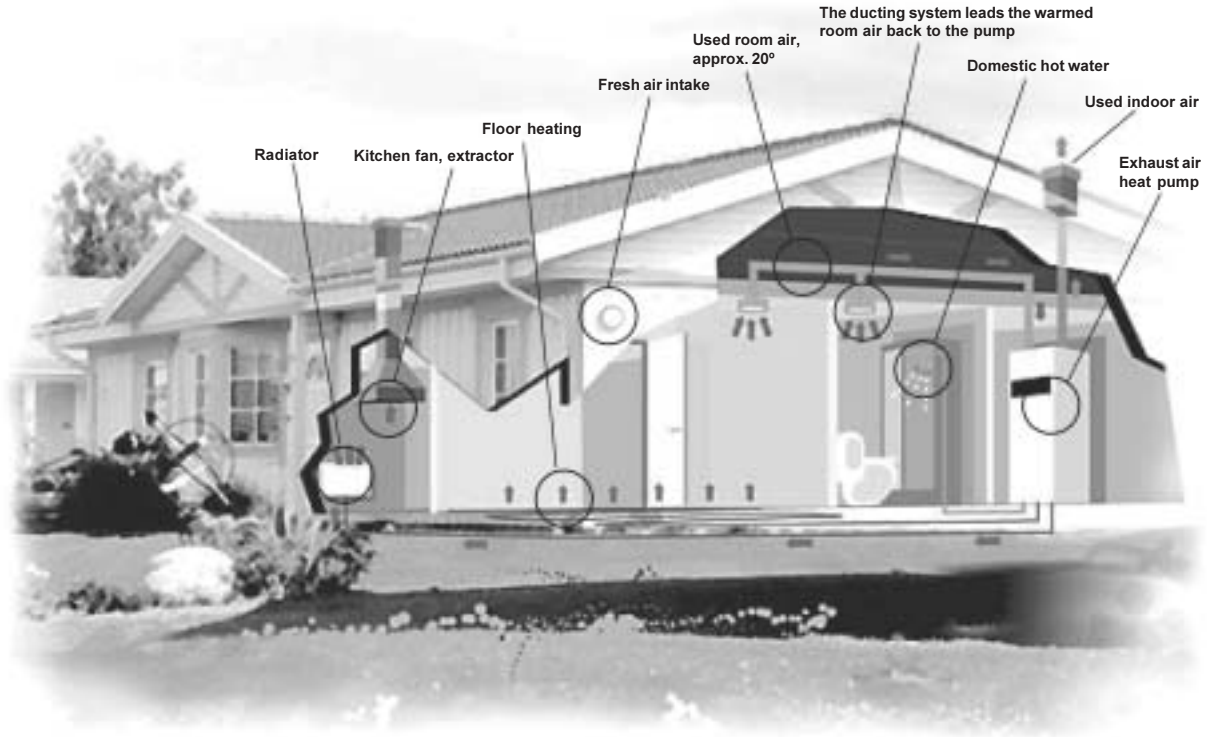
2. Set the correct heating curve.

3. Wait 24 hours. Fine tune the curve if the temperature does not feel good. Wait another 24 hours. Continue to fine tune if necessary.

4. If your radiators have thermostats they can be set at the required temperature in the rooms facing south that get additional heat from the sun or in rooms where you prefer a lower temperature, for example, bedrooms. The door must be kept shut. This also applies to floor heating systems with room thermostats.

5. Newly installed exhaust air heat pumps might need to be vented several times during the first weeks. Vent the system according to the instructions under **"Troubleshooting / Are the radiators cold despite the plant being switched on?"**

System description



This is how your heat pump works:

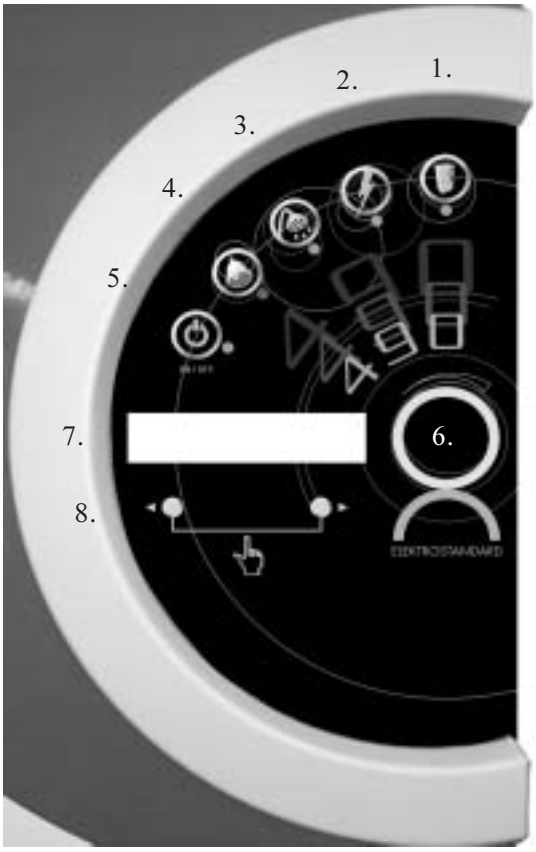
1. Outdoor air is taken in through windows or wall ventilators and is heated up by the radiators/floor heating. Outdoor air can also be taken in through an intake air unit (accessory).

2. The used 20 degree room air is led through exhaust ventilators in the kitchen and wet rooms to the heat pump. The heat from the air is efficiently recovered before it leaves the house.

3. The recovered energy is used to produce hot water in the summer and to also warm up the house in the winter. The immersion heater connects automatically if additional heat is required. When the heating system starts according to the settings, it automatically heats the house to the set temperature and hot water to the required temperature. The hot water heater holds 163 litres.

From the outside

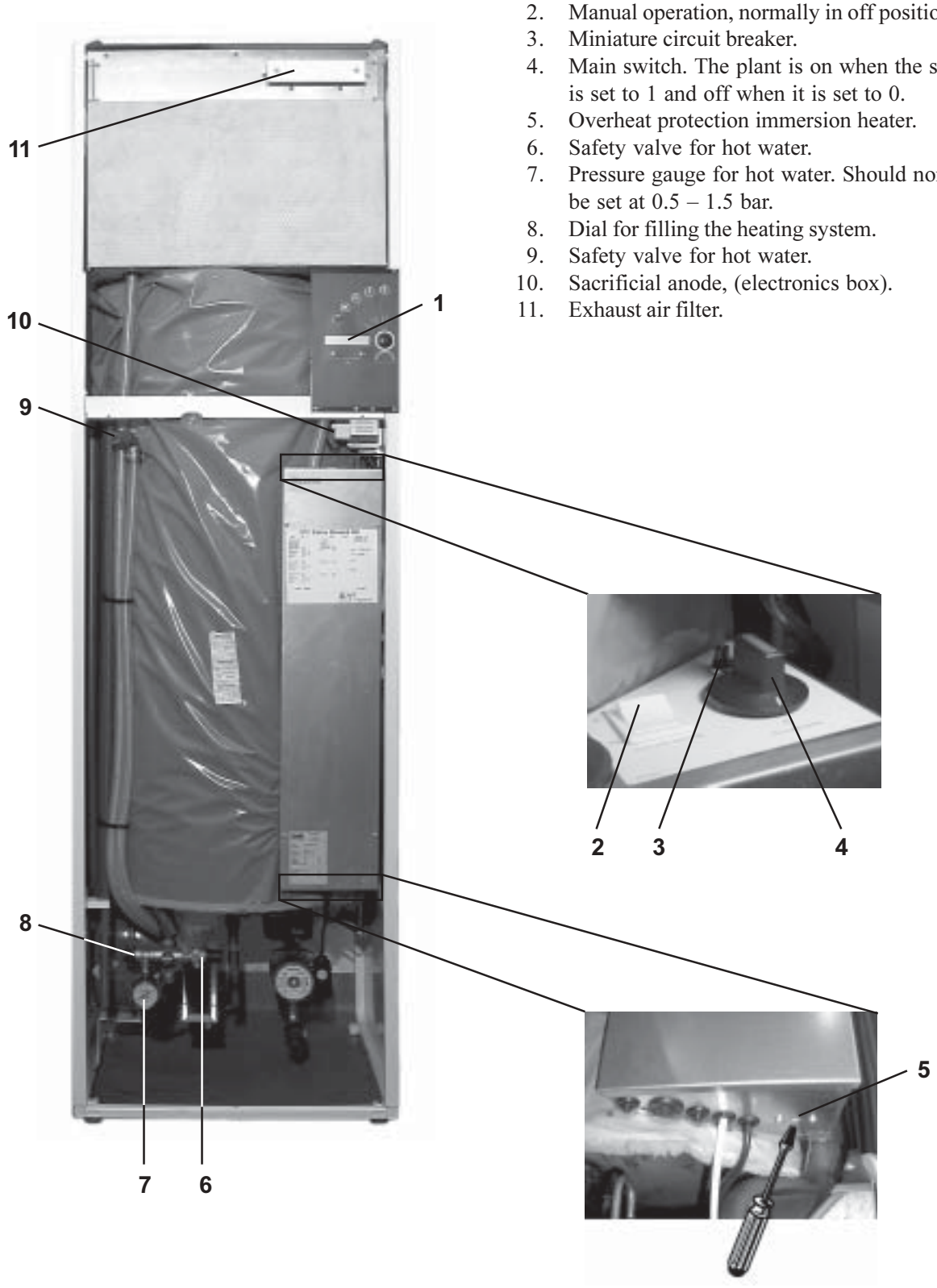
From the front of the heat pump you can see five lamps, three push buttons, a dial and a display.



1. This lamp is lit when the compressor is in operation.
2. This lamp is lit when additional heat is in operation.
3. This lamp flashes during peak hot water and comes on fully when extra hot water is activated.
4. This lamp flashes or comes on fully when a fault has occurred.
5. This switch is used to turn the heat pump on and off. This lamp lights when the heat pump is on and flashes when it is off.
6. This dial is used to navigate the menus and to change settings.
7. The display shows information in clear text.
8. Buttons for navigating the menus.

From the inside

1. Display.
2. Manual operation, normally in off position.
3. Miniature circuit breaker.
4. Main switch. The plant is on when the switch is set to 1 and off when it is set to 0.
5. Overheat protection immersion heater.
6. Safety valve for hot water.
7. Pressure gauge for hot water. Should normally be set at 0.5 – 1.5 bar.
8. Dial for filling the heating system.
9. Safety valve for hot water.
10. Sacrificial anode, (electronics box).
11. Exhaust air filter.



Instant settings

The instant settings menu lets you access all normal functions in a very simple and flexible way. The following examples are based on the factory settings.

Heating curve

Here you choose a curve adapted to suit your house. A higher value provides a warmer indoor temperature. (see Heating curve)

1. Press the left button once and the text **"Sel'd htg curve"** and the set curve appears on the screen.
2. Press the right button **("Adjust")**, the display now shows the set value. Turn the dial clockwise to increase the heat curve and anticlockwise to reduce it.
3. Press the right button **("Save")** when you have set the required value. The required value is now saved. Press the left button to return to the main menu.

Indoor temperature

Here you choose a suitable indoor temperature. Requires a room sensor (accessory)

1. Press the left button once and the text **"Sel'd htg curve"** and the set curve appears on the screen.
2. Turn the dial until the text **"Sel'd in temp"** appears on the screen.
3. Press the right button **("Adjust")**, the display now shows the set value. Turn the dial clockwise to increase the temperature and anticlockwise to reduce it.
4. See item 3 under Heating curve.

Extra hot water

Choose extra hot water if you have a temporary need for more hot water.
NOTE: The economy mode function is partly disabled during extra hot water.

1. Press the left button once and the text **"Sel'd htg curve"** and the set curve appears on the screen.
2. Turn the dial until the text **"Extra HW 0/ 0 hrs"** is displayed. The first "zero" indicates the time remaining before the extra hot water function is switched off. The other "zero" shows the initial length of time you have selected.
3. Press the right button **("Adjust")**, the display now shows the set value. Turn the dial clockwise to increase the number of hours with additional hot water and anticlockwise to reduce the number of hours.
4. See item 3 under Heating curve.

Economy mode

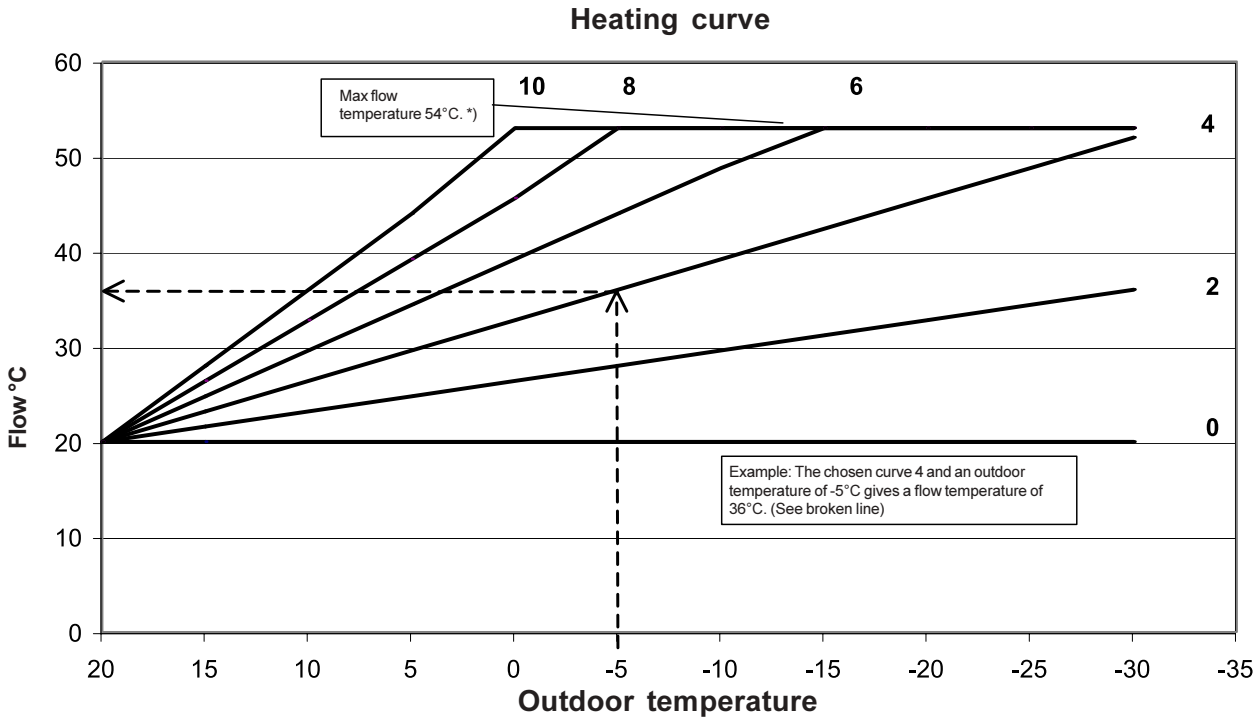
Economy mode helps you increase the savings factor, but also means a reduction in available hot water.

1. Press the left button once and the text **"Sel'd htg curve"** and the set curve appears on the screen.
2. Turn the dial until **"Status: Normal mode"**appears on the display.
3. Press the right button **("Adjust")**, the display now shows: **Economy mode?".**
4. If you require economy mode press the right button **("Yes")**.
5. Status now shows economy mode, if you require normal mode press the right button **("Adjust")**. The display now shows **"Normal mode?"**
6. If you require normal mode again, press the right button **("Yes")**.
7. The required setting has now been saved. Press the left button to return to the main menu.

Setting the heating

Setting the indoor temperature

Your heating system is controlled by the outdoor temperature. This means that the colder it gets, the warmer the water supplied to the heating system (radiators or floor heating).



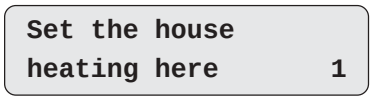
*) Max. flow temperature can be changed by the installer. The highest outgoing heat transfer fluid temperature is approx. 58°C.

Setting the heating

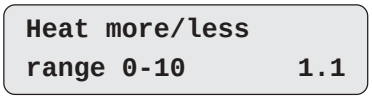
Basic settings

The basic curve is normally set when adjusting the plant. Check that the curve corresponds to your heating requirements. If you require another basic curve:

1. Press the right button once and the text **"Set the house heating here"** appears on the screen.



2. Press the right button once again and the text **"Heat more/less range 0-10"** appears on the display.



3. Press the right button once and the text **"Set value:"** appears on the display.

4. Press the right button **("Adjust")**. The set value is shown on the display. Turn the dial to the right to increase the heat and anticlockwise to reduce it.

5. Press the right button when the required value is set **("Save").** The required value is now saved. Press the left button to return to the main menu.

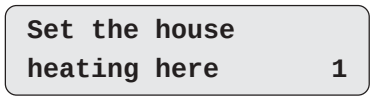
Curves 1-4 are used for floor heating, 1-2 is normal for concrete flooring and 3-4 for wooden.

Other curves are for the radiator system. In a newly-built house, curve 5 is normal for radiator systems. Choose curve 6 or higher if you require a higher temperature.

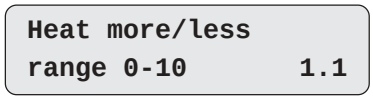
Setting the heating, cont.

Fine tuning

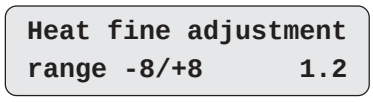
If the indoor temperature is felt to be too low or too high you can fine adjust it by parallel offsetting the heating curve.



1. Press the right button once and the text **"Set the house heating here"** appears on the display.



2. Press the right button once and the text **"Heat more/less range 0-10"** appears on the display.



3. Turn the dial clockwise until the text **"Heat fine adjustment range -8/+8"** appears on the display.

4. Press the right button again and the text **"Set value:"** appears on the display.

5. Press the right button **("Adjust").** The set value is shown on the display. Turn the dial clockwise to increase the heat and anticlockwise to reduce it.

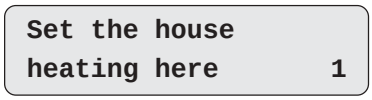
6. Press the right button when the required value is set **("Save").** The required value is now saved. Press the left button to return to the main menu.

Heating curve

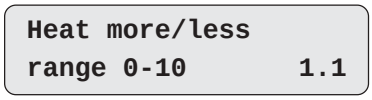
Adapting the heat curve

You can adapt the heating curve to make it a bit warmer or cooler for the outdoor temperature for which you consider the indoor temperature to be unsatisfactory.

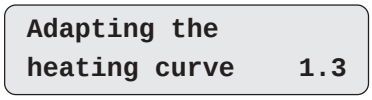
1. Press the right button once and the text **"Set the house heating here"** appears on the display.



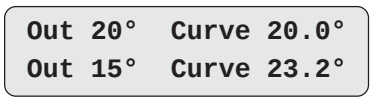
2. Press the right button once again and the text **"Heat more/less range 0-10"** appears on the display.



3. Turn the dial until the text **"Adapting the heating curve"** appears on the display.



4. Then press the right button. The display shows **"Out 20° Curve 20.0°"**. Turn the dial until the outdoor temperature for which you want to adapt the heating curve is at the top.



5. Press the right button and the set value appears on the display. Turn the dial until the required value is set.

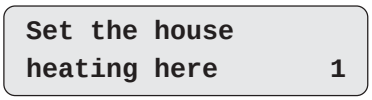
6. Press the right button when the required value is set **("Save")**. The required value is now saved. Press the left button to return to the main menu.

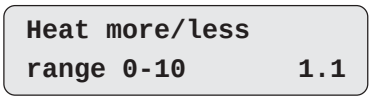
Room temperature

Setting the room temperature

(This requires a room sensor which is an accessory.)

An indoor sensor can be installed in addition to the outdoor sensor. The sensor affects the heating curve by increasing or reducing the flow temperature to adapt to the selected indoor temperature.
Room sensor control does not function in all houses, it depends on the lay-out (not used with floor heating).





1. Press the right button once and the text **“Set the house heating here”** appears on the display.
2. Press the right button once again and the text **“Heat more/less range 0-10”** appears on the display.
3. Turn the dial until **“Setting room temperature”** appears on the display.
4. Press the right button, the display now shows **“Set value:”.**
5. Press the right button**(“Adjust”)**. Turn the dial until the required value is set.
6. Press the right button when the required value is set **(“Save”).** The required value is now saved. Press the left button to return to the main menu.

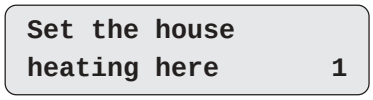
Room sensor influence

Setting the room sensor influence

(This requires a room sensor which is an accessory.)

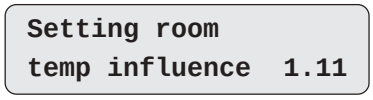
If you have an indoor sensor, you can set it so that it influences the heating curve. For each degree of deviation from the required room temperature, the heat curve is corrected with the set influence. Example: If the room is one degree too warm and the set value is 5, the flow temp is reduced by 5°C.

1. Press the right button once and the text **"Set the house heating here"** appears on the display.



2. Press the right button once again and the text **"Heat more/less range 0-10"** appears on the display.

3. Turn the dial until **"Setting room temp influence"** appears on the display.



4. Press the right button once and the text **"Set value:"** appears on the display.

5. Press the right button **("Adjust")**, the display now shows the set value. Turn the dial until the required value is set.

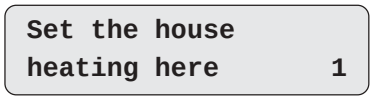
6. Press the right button when the required value is set **("Save").** The required value is now saved. Press the left button to return to the main menu.

Temporary heat reduction

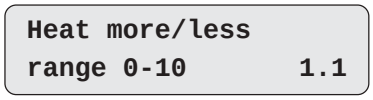
Holiday function

If you are going away for a few days or more it is worth lowering the temperature in the house.

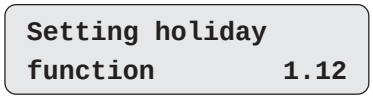
Using the **"Setting holiday function**" you can set the number of days you are away. This function lowers the flow temperature 10 degrees below the set heating curve (this parameter is adjustable under 1.13). The temperature is automatically raised to the normal level at the end of the last day.



1. Press the right button once and the text **"Set the house heating here"** appears on the display.

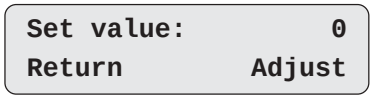


2. Press the right button once again and the text **"Heat more/less range 0-10"** appears on the display.

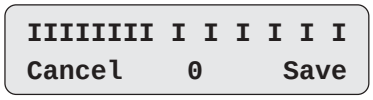


3. Turn the dial to the right until **"Setting holiday function"** appears on the display.

4. Press the right button once and the text **"Set value:"** appears on the display.



5. Press the right button **("Adjust")**, the display now shows the set value. Turn the dial to the right until the right number of days for the holiday function has been set.



6. Press the right button when the required value is set **("Save").** The required value is now saved. Press the left button to return to the main menu.

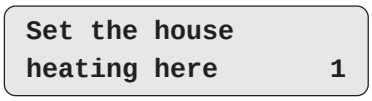
Summer mode

Setting summer mode

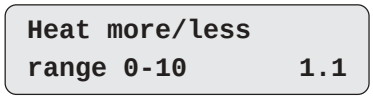
You can set the outdoor temperature for which you want the heating to stop. Factory setting is 17°C.

NOTE: In order to prevent switching between heating mode and summer mode (between day and night) the transition from winter mode to summer mode is delayed by one hour and from summer mode to winter mode by six hours.

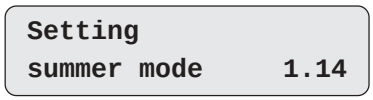
1. Press the right button once and the text **"Set the house heating here"** appears on the display.



2. Press the right button once again and the text **"Heat more/less range 0-10"** appears on the display.



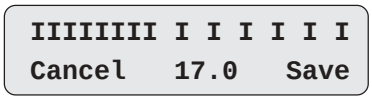
3. Turn the dial to the right until **"Setting summer mode"** appears on the display.



4. Press the right button once and the text **"Set value:"** appears on the display.

5. Press the right button **("Adjust")**, the display now shows the set value. Turn the dial until the required value is set.

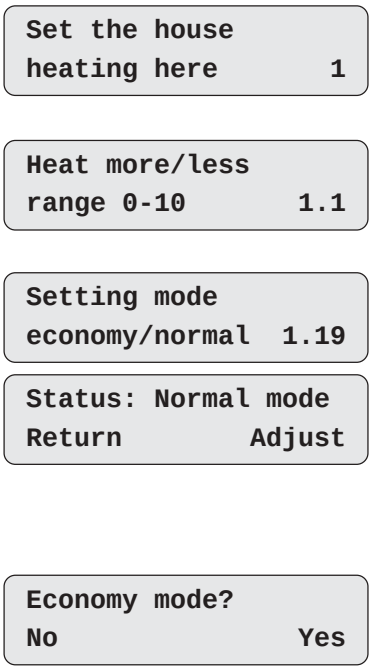
6. Press the right button when the required value is set **("Save").** The required value is now saved. Press the left button to return to the main menu.



Continuous summer mode

If you would like summer mode to be continuously enabled carry out steps 1-5 above. Now turn the temperature up to 30°C and the four dashes will indicate that house heating has been switched off. Press the right button **("Save")**. Return to the main menu by pressing the left button repeatedly. Turn the dial a little to access the info menu. The info menu now shows **"House heating off"**. Repeat the above to connect the heating again and set the temperature when the heating season should start, normally 17°C.

Economy mode / normal mode



Setting economy mode / normal mode

Economy mode helps you save energy but it takes longer to heat the hot water and the room temperature can vary somewhat.

1. Press the right button once and the text **"Set the house heating here"** appears on the display.
2. Press the right button once again and the text **"Heat more/less range 0-10"** appears on the display.
3. Turn the dial until **"Setting mode economy/ normal"** appears on the display.
4. Press the right button once and **"Status: Normal mode"**appears on the display.
5. Press the right button **("Adjust")**, the display now shows **"Economy mode?"**.
6. To activate economy mode press the right button **("Yes")**.
7. Press the left button **("No")** to return to the main menu.

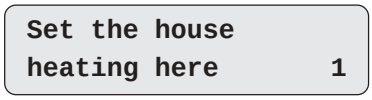
Setting the hot water

Extra hot water

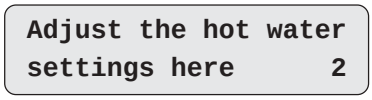
When you want the possibility of extra hot water, for example when you have guests. This setting is also suitable if you suddenly require a large amount of hot water, e.g. if you have a bubble bath.

NOTE: Extra hot water consumes more electricity.

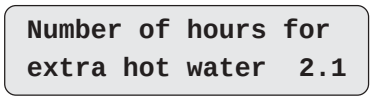
1. Press the right button once and the text **"Set the house heating here"** appears on the display.



2. Turn the dial to the left until the text **"Adjust the hot water settings here"** appears.



3. Press the right button once and the text **Number of hours for extra hot water** appears on the display.



4. Press the right button once and the text **"Remain: 0/ 0 hrs"** appears on the display. The first number indicates how long remains before the extra hot water function is deactivated. The second number shows the initial value you selected. The shower symbol is lit to show that this function is activated.

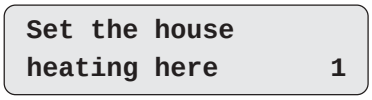
5. Press the right button **("Adjust")**, the display now shows the set value. Turn the dial clockwise to increase the number of hours with additional hot water and anticlockwise to reduce the number.

6. Press the right button when the required number of hours has been set **("Save").** The required value is now saved. Press the left button to return to the main menu.

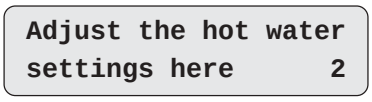
Setting the hot water

Peak hot water

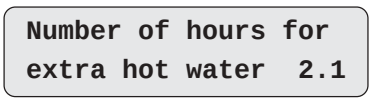
Here you set the interval for temporarily increasing the hot water temperature. This function ensures that no bacterial growth occurs in the domestic hot water tank. When this function becomes active the shower symbol flashes in order to attract your attention to this process.



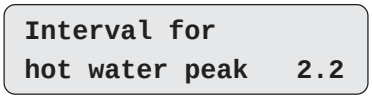
1. Press the right button once and the text **"Set the house heating here"** appears on the display.



2. Turn the dial to the left until the text **"Adjust the hot water settings here"** appears.



3. Press the right button once and **"Number of hours for extra hot water"** appears on the display.



4. Turn the dial clockwise until **"Interval for hot water peak"** appears.

5. Press the right button once and the text **"Remain: 7/ 7day"** appears on the display. **NOTE:** The first number indicates how long remains until the next hot water peak. This will count down the days to zero. The other number indicates the interval when you want the peak to return.

6. Press the right button **("Adjust")**, the display now shows the set value. To change the interval, turn the dial.

7. Press the right button when the required number of days is set **(Save)**. The required value is now saved. Press the left button to return to the main menu.

Checking temperatures

Temperatures in the heat pump

From **“Here you can see all temperatures”** you can read the sensor temperatures in the heat pump. Proceed as follows:

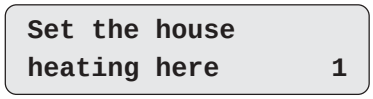
1. Press the right button once and the text **“Set the house heating here”** appears on the display.

2. Turn the dial clockwise until the text **“Monitor all temperatures”** appears.

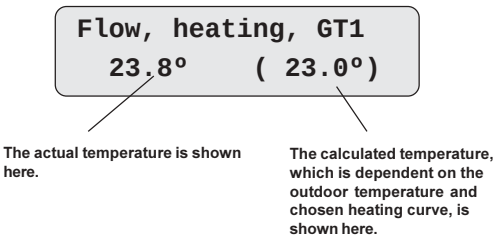
3. Press the right button once, and turn the dial until the temperature you want to check appears.

4. Press the left button a few times to return to the main menu.

The contents of respective displays are shown on the following pages.

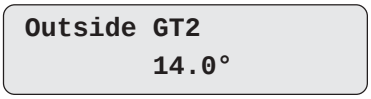


Checking temperatures, continued



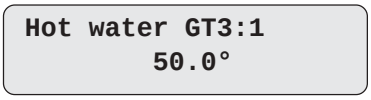
Flow temperature

"Flow, heating, GT1" shows the temperature that the heat pump supplies to the system.



Outdoor temperature

"Outside GT2" shows the outdoor air temperature.

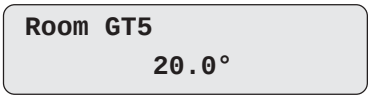


Hot water tap temperature

"Hot water GT3:1" shows the temperature that the heat pump supplies to the hot water tap system.

Indoor temperature

(Requires an indoor sensor which is an accessory)



"Room GT5" shows the indoor temperature.

Other temperatures

Three other temperatures are shown: Hot water GT3:2, Hot water GT3:3 and Compressor GT6. These are solely for the heat pump's internal usage.

Setting the additional heat

Disconnecting the compressor unit

On some occasions it may be apt to run the heat pump as an electric boiler. Proceed then as follows:

1. Press the right button once and the text **"Set the house heating here"** appears on the display.

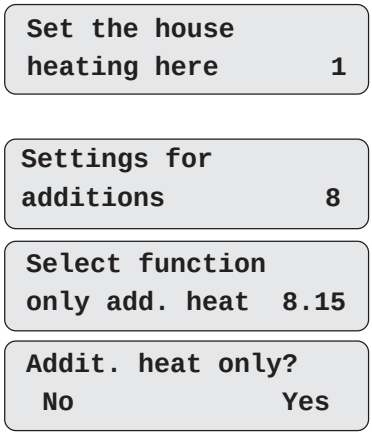
2. Turn the dial until the text **"Settings for additions"** appears.

3. Press the right button once and the text **"Select function only add. heat"** appears on the display.

4. Press the right button once again and the text "**Addit. heat only?**" appears on the display.

5. Press the right button **("Yes")**, and you see **"OK..."** as a sign the choice has been implemented.

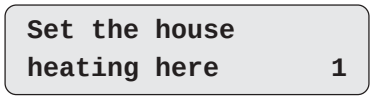
6. Repeat steps 1-5 to reconnect the compressor unit. Press the left button a few times to return to the main menu.



Setting the additional heat, continued

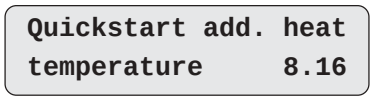
Rapid start additional heat

The heat pump normally delivers the entire house's supply down to an outdoor temperature of +5°C. (This should be seen as a guide and differs from case to case depending on the hot water consumption, size of the house, etc.)
When the outdoor temperature falls below the temperature set in 8.16 the additional heating delay is shortened to quickly meet the heating requirement. If you feel it takes too long before the domestic hot water becomes warm you can increase this temperature. Remember that a higher value increases electricity consumption.



1. Press the right button once and the text **"Set the house heating here"** appears on the display.

2. Turn the dial until the text **"Settings for additions"** appears.



3. Press the right button once and the text **"Quickstart add. heat temperature"** appears on the display.

4. Press the right button again and the text **"Set value**:" appears on the display.

5. Press the right button **("Adjust")**. The set value is shown on the display. Turn the dial to change the value.

6. Press the right button **("Save")** once the required temperature has been set**.** The required value is now saved. Press the left button a few times to return to the main menu.

Maintenance

Cleaning the air filter
(every other month)
A clean air filter is a must if the heat pump is to function properly. Remove the front plate and pull out the filter. Rinse the filter in lukewarm water or clean it with a vacuum cleaner. *(no. 11)* .
A reminder alarm occurs every other month. This does not affect control functions but must be acknowledged after the filter has been cleaned. Acknowledge by pressing the right button, the red alarm lamp will then go out.

Cleaning the ceiling or wall-mounted valves
(twice a year)
Remove the valve carefully. Wash in mild detergent without changing the setting. Let it dry before putting it back. When the plant restarts, each valve will return to its individual setting. Only wash one valve at a time so they do not get mixed up.

Checking the pressure gauge in the connecting area
(twice a year)
This is especially important when the plant is started up in the autumn. Pressure gauge for the hot water *(No. 7)* must read 0.5 - 1.5 bar. If the pressure is lower than 0.5 bar you should fill with water up to around 1.0 bar. *(see "Troubleshooting".)*

Sacrificial anode
There is a sacrificial anode placed under the insulation at the top of the hot water cylinder. Its purpose is to prevent corrosion. The cylinder must be full of water for the sacrificial anode to work.
There is a LED *(no. 10)* in the panel of the anode control box. It shows a red or a green light. If the LED shows green, the sacrificial anode is operating and working normally. If large amounts of hot water are drawn off (when filling a bath for instance) the LED may show a red light for a short time even though there is no fault. If the LED shows red for more than 10 hours, the anode is faulty and a service engineer must be called.

Troubleshooting

What to do if there is a fault

If something is wrong, begin by working through the following checklist:

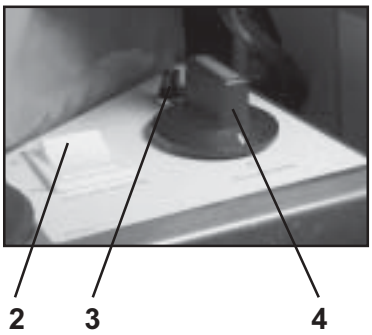
Is the power on?
The main switch (*no. 4*) must be set to 1 and the green lamp on the control panel should be lit or flashing.

Are the circuit fuses and main fuses of the building OK?
If the switches are on and the green lamp is not lit, a fuse may have blown. Check this and replace the fuse if necessary.

Is the control panel unlit?
Press the MCB on the electrical box *(no. 3)* once. If the control panel goes off again contact your service engineer. Also check that the manual operation switch is off. *(no. 2).*

Is the display flashing?
This is not a fault. It is part of the control unit's monitoring function.

Are the radiators cold despite the plant being switched on?
Check that the radiators have been properly vented. Turn off the plant at the main switch when venting. Vent the heat pump with the vent nipple at the side of the safety valve (*no. 9*) for the hot water. Open the nipple a couple of turns until water comes out. Close the nipple afterwards. If one or more of the radiators are still cold contact the plumber.



Troubleshooting

Is the house cold? Is there no hot water?
Under the electrical box there is an overheat protection device for the immersion heater (*no. 5*). The overheat protection is for emergencies and does not normally trip. If the overheat protection device has tripped, press it in firmly. The installation should then work again. If the overheat protection device trips frequently, call a service engineer to establish the cause.

Does the pressure gauge in the connecting area show the correct pressure?
Pressure gauge (*no. 7*) should normally read 0.5 -1.5 bar. If the pressure is below 0.5 bar then there is not enough hot water. The dial for topping up the heating water is located in the connection area (*no. 8*).

Is the red lamp flashing?
Check and make a note of the error message on the display. Reset the alarm by pressing the right button once. If the lamp goes off then all is well.

If the lamp stops flashing and goes over to a steady red light, wait for 1-2 hours. If the problem remains contact your service engineer.

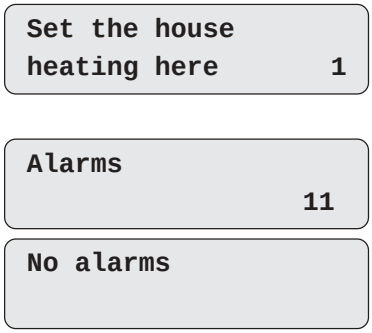
If necessary, the heating of the house can be controlled manually. This is what to do:
1. Switch off the main switch.
2. Set the manual control switch to “On” (*no. 2*)
3. Press in the dial on the shunt valve and turn anticlockwise until it stops. The temperature for manual control is preset when adjusting. If you have a floor heating system the hot water temperature will be lower than in normal mode.
4. Turn the main switch to “1”.

NOTE: The panel is not lit in this position.

Troubleshooting, cont.

Alarms

Here is a list of all the alarms that have been reset but not remedied.

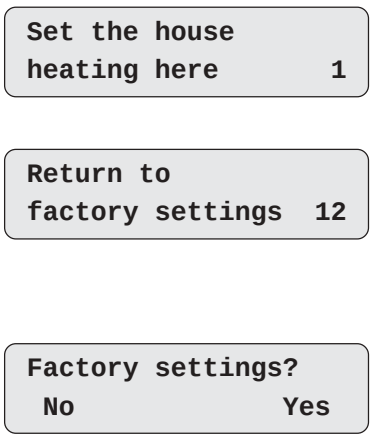


1. Press the right button once and the text **"Set the house heating here"** appears on the display.
2. Turn the dial to the right until **"Alarms"** appears on the display.
3. Press the right button and you can clearly see the alarms that have occurred but not remedied.
4. Press the left button to return to the main menu.

Have you pressed the wrong button and got lost?

NOTE: Use this function with care as your personal settings can be deleted. Settings made by the service engineer/installation engineer are not affected.

To reset to factory settings:



1. Press the right button once and the text **"Set the house heating here"** appears on the display.
2. Turn the dial until the text **"Return to factory settings"** appears on the display.
3. Press the right button once and the text **"Factory settings?"** appears on the display.
4. Press the right button **("Yes")**, the heat pump now returns to the factory settings.

For the installer

The following pages contain essential information for correctly installing the plant.

IVT 490 / ElektroStandard is a heat pump that recovers energy from the exhaust air. It is supplemented with an immersion heater in a double-shelled hot water heater.

The 490 is controlled by the outdoor temperature through an outdoor temperature sensor. This is normally sufficient to achieve a comfortable indoor climate. A room sensor can also be used as a complement to the outdoor sensor (accessory). This is installed by your service engineer or installer. The sensor affects the heating curve by increasing or reducing the flow temperature to adapt to the selected indoor temperature.

A green control lamp on the front of the unit shows that the power is on and everything is working normally. When the lamp flashes it means the system is turned off. But note that there is still power in the system. A red control lamp indicates that something is wrong and the fault is shown in clear text on the display screen.
It is also possible to individually test run all the heat pump components.

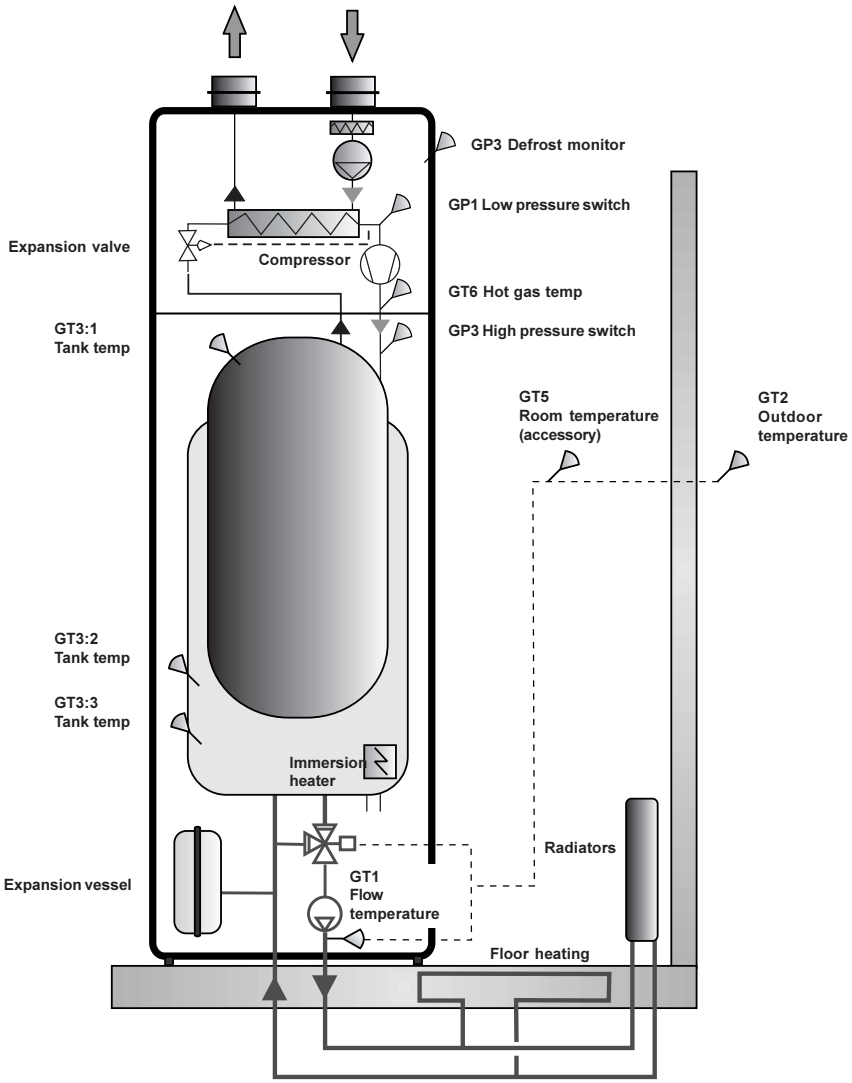
The 490 is available in three power variants, 6, 9 or 12 kW. Fuse protection 16A respective 20A. Model 490 in the 12 kW design can easily be converted to 13.5 kW with the help of the supplied cable. 25A fuse protection is then necessary.

The 490 is prepared to collect supplementary energy from, e.g. an accumulator tank, which is charged with energy from a solar collector, wood-fired boiler or the like. If you would like to know more about this please contact your supplier.

A power monitor is available as an accessory to 490 that prevents overloading the main fuses.

Where there is a combination of, for instance, floor heating and a radiator system, where two different flow temperatures are required, an intermediate shunt group must be installed.

Product diagram



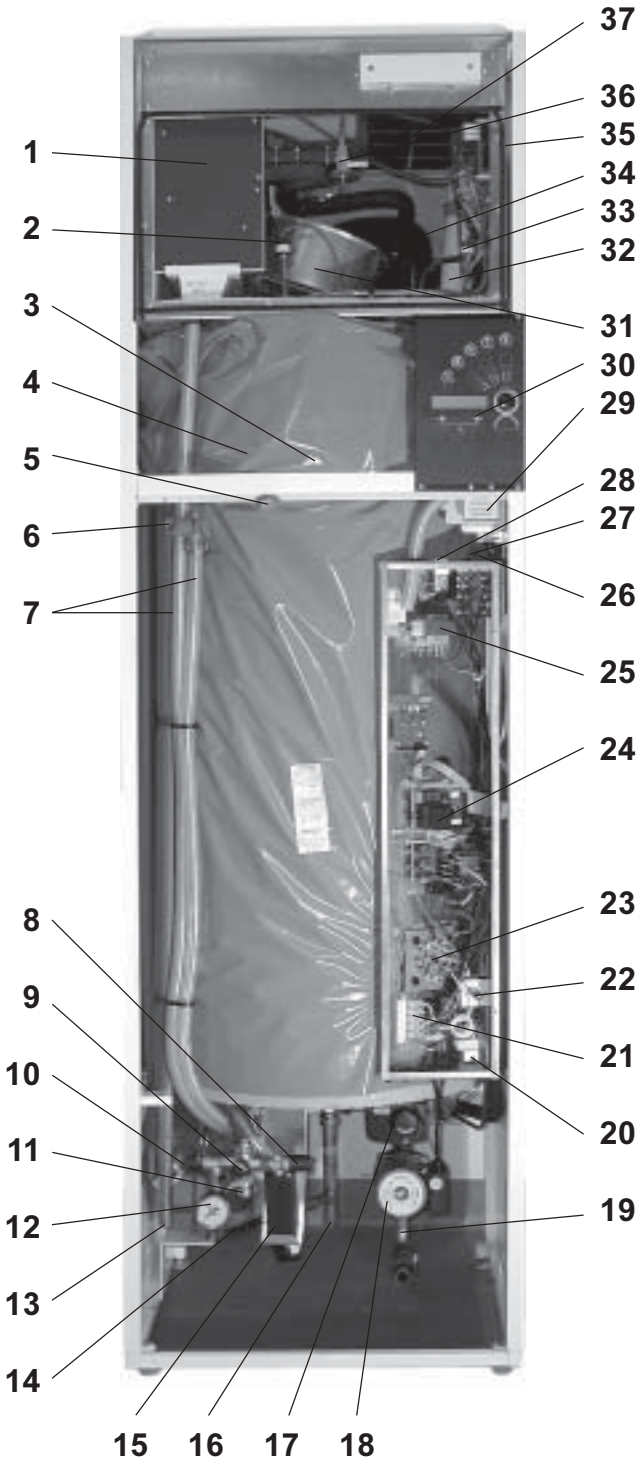
Product data IVT 490 / ElektroStandard

Height	mm	2090
Width	mm	600
Depth	mm	615
Hot water cylinder volume	litres	163
Compressor output	W	500-700
Min. flow exhaust air see diagram	Pressure/Air flow	
Max. flow exhaust air see diagram	Pressure/Air flow	
Min. flow heating system	l/s	0

Electric boiler	kW	6, 9 or 12/13,5
Heat pump output	kW	1,7-2
Weight excl. water	kg	165
Weight incl. water	kg	385
Refrigerant R 134a	kg	0,975
Max. working pressure	bar (MPa)	2,5 (0,25)
Overheat protection	C	95
Expansion vessel	litres	12

List of components

1. Evaporator
2. Low pressure switch
3. Sacrificial anode (concealed under the insulation)
4. Hot water tank
5. Venting nipple
6. Safety valve, hot water
7. Waste water hoses
8. Safety valve, tap water
9. Shutoff valve, incoming water
10. Filling tap for the heating system
11. Cold water connection
12. Pressure gauge
13. Hot water connection
14. Drain heating system (behind waste water cup)
15. Discharge water cup
16. Heating system return connection
17. Shunt valve
18. Circulation pump
19. Heating system connection riser
20. Overheat protection electric boiler
21. Electrical terminal
22. Thermostat for manual operation
23. Immersion heater
24. Power card
25. Fan transformer
26. Miniature circuit breaker (pushbutton behind main switch)
27. Main switch
28. Manual switch
29. Anode control unit
30. Control unit
31. Exhaust air fan
32. Combi-drier
33. High pressure switch
34. Compressor
35. Fan card
36. Expansion valve
37. Air filter

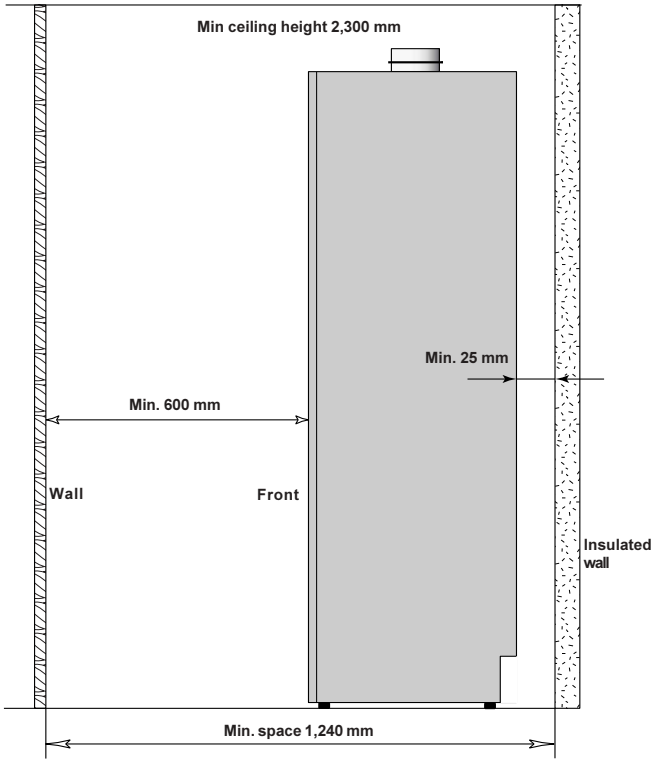


Installation, general

For the unit to work in the right conditions it is important that the installation of electricity, water, ventilation and general installation comply with the following instructions.
Information is forwarded to each contractor by the customer/builder.

Required installation space
A free space of 600 mm is required in front of the unit. Other sides may be blocked.
Ventilation requires a ceiling height of at least 2,300 mm. The lowest ceiling height for raising the unit is 2,150 mm.
In addition, at least 25 mm is required between the unit and other fixed installations (walls, sinks, etc.). A suitable placement is against an outer wall or insulated partition wall.

NOTE:
If a bubble bath or other large consumer of hot water is to be installed, contact your supplier.



Pipe connections

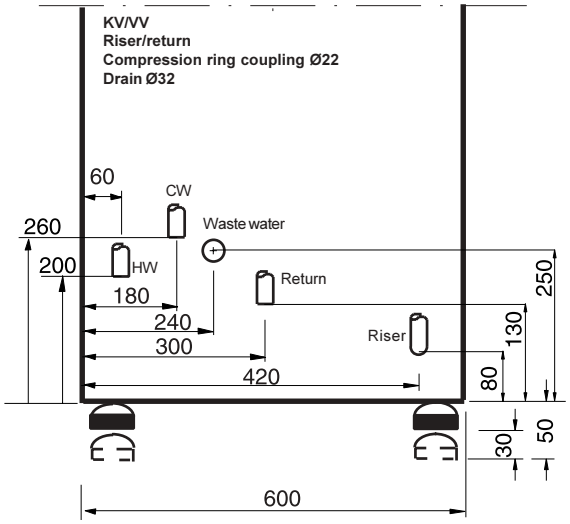
Connections
A 32 mm plastic pipe is drawn from the waste water pipe to the floor drain.
The flow is connected to the outlet marked “Forward flow”.
The return is connected to the outlet marked “Return flow”.
Cold water and hot water are connected to outlets marked “Cold water” and “Hot water”.

Pipe dimensions

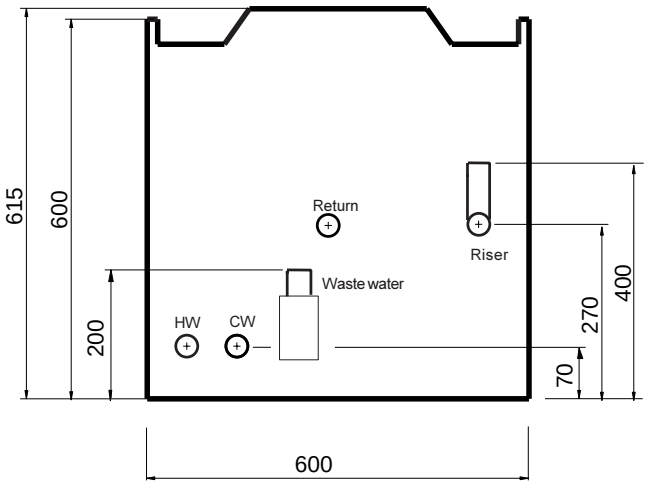
Riser/return		
Compression ring coupling	mm	Ø22
CW and HW		
Compression ring coupling	mm	Ø22
Waste water connection	mm	Ø32

Pipe installation, pump diagram

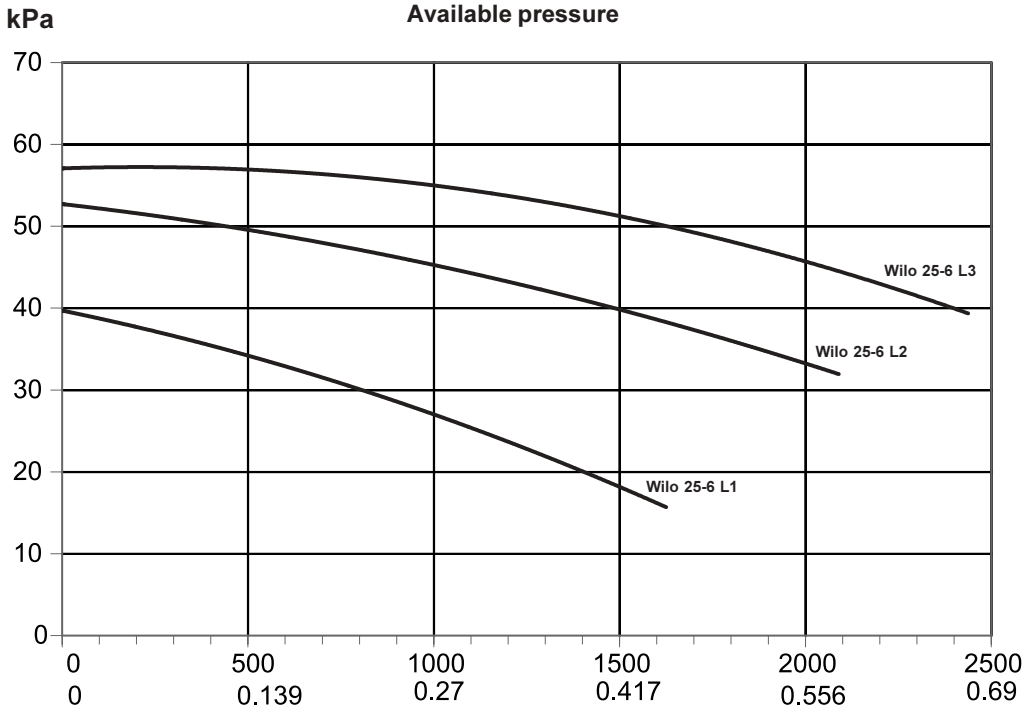
Standard pipe connections



Seen from the front



Seen from above



Electrical installation

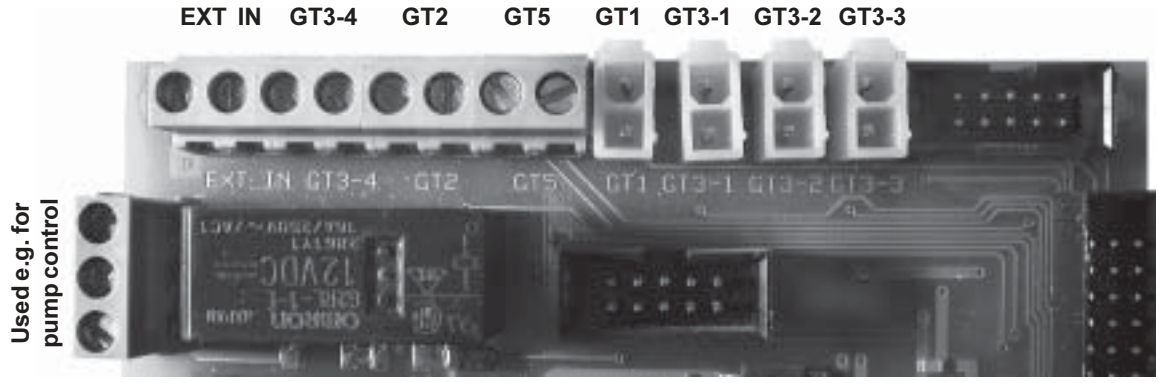
Connecting the unit

NOTE: Heavy-current and low-current wiring must be kept at least 150 mm apart. Only an authorised installer may install the unit and change its power setting.

Placement and connection of sensors

Outdoor sensor
(art. no. 240650)
The sensor is positioned on the north or east side of the house. It must be protected from direct sunlight, ventilation air or anything that can affect the temperature measurement. Seal the cable conduit so that warm indoor air cannot penetrate and affect the sensor. Connect to terminal pos. GT2 with 2-wire low voltage cable

Room sensor
(accessory art. no. 240650-1)
Place the sensor centrally in the house, e.g. in a hall with an opening to a living room etc. The sensor must be positioned to avoid direct sunlight or other heat sources such as a kitchen or laundry room. The conduits must be sealed here as well to stop warm air from penetrating and affecting the sensor reading. Connect to terminal pos. GT5 with 2-wire low voltage cable The sensor is best placed on the bottom floor of a house with two floors. The radiators in the room where the sensor is placed must not be equipped with thermostatic valves. If there are thermostatic valves then ensure they are always open. The room sensor must be activated by a service engineer.



Marking on the circuit card can differ to that illustrated. However, it is the marking above the figure that applies.

Electrical installation

Output (kW)

Electric boiler	6, 9 or 12/13,5
Circulation pump	0,1
Compressor	0,5-0,7
Fan	0,165
Total specified output	8, 11 or 14/15,5

Power supply

Voltage	400V, 3 N
Max. power consumption	7, 10 or 13/14.5 kW

Connect to separate group fuse	6 kW	16 A
	9 kW	16 A
	12 kW	20 A
	13.5 kW	25 A

Conductor area (mm²)

From the fuse panel	5-conductor	16 A	at least 2.5
		20 A	at least 4.0
		25 A	at least 6.0
From the outdoor sensor	2-wire low voltage. 0,2		
From room sensor	2-wire low voltage. 0,2		
From power monitor to transformers			at least 0.75

(accessory)
Power monitor
The heat pump can be ordered with or without a power monitor.
If you wish to order a power monitor at a later date the article number is 9518358. The power monitor must be supplemented with three transformers, article number 9404497.
NOTE! These are ordered individually The cable between the electrical cabinet and the heat pump is not included. Work must be carried out by a qualified electrician. The power monitor can be set for 16, 20, 25 and 35A

Earth-fault breaker
Leaking current occurs in all electrical plants and in all earthed electrical apparatus. The leakage increases as the product ages, wears and gets dirty. Several high-power devices may cause an installed 30 mA earth-fault breaker to trip even if there is no serious fault. Consequently, if an earth-fault breaker is installed across the heat pump it must be of at least 300 mA. Comply with applicable regulations.

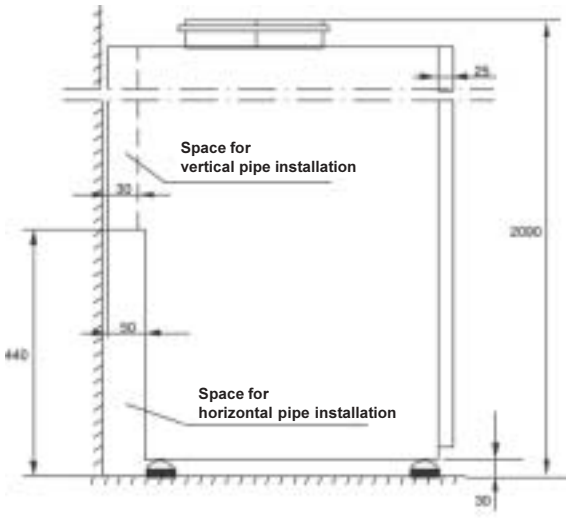
Sensor table

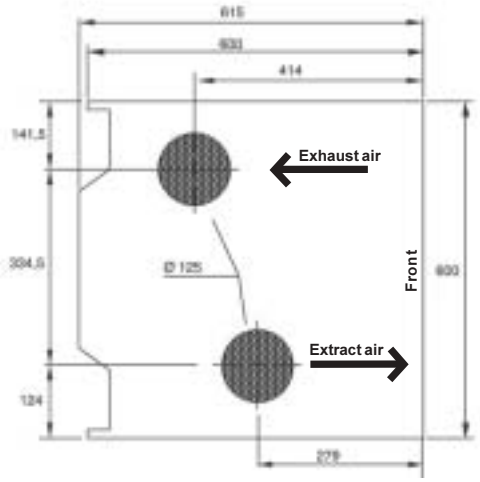
The table shows all sensor-resistance at different temperatures.

Temperature (°C)	kΩ
-40	154,300
-35	111,700
-30	81,700
-25	60,400
-20	45,100
-15	33,950
-10	25,800
-5	19,770
0	15,280
5	11,900
10	9,330
15	7,370
20	5,870
25	4,70
30	3,790
35	3,070
40	2,510
45	2,055
50	1,696
55	1,405
60	1,170
65	0,980
70	0,824
75	0,696
80	0,590
85	0,503
90	0,430

Connecting the ventilation

View from the back





View from above

Connecting the ventilation
Connected to lowest air tightness class B ducting system (according to current norms). Must not be connected to air conditioning systems containing a lot of dust or grease, or from rooms with inflammable substances or gases that might reach the heat pump.

Connecting spigots
Dimension Ø 125 mm, fitted with a rubber seal. The connection between the unit and the ducting system should be made with a short, flexible hose, ensure that the hose is positioned to make it easy to change.

Ducting insulation
Current norms shall be applied. Outgoing ducting from the unit (exhaust air) must be insulated against condensation without a break from unit to brackets to roof hood. Also see the ventilation drawing.

Stove, tumble dryer and cooker fan
If a stove is installed, underpressure (which would draw smoke in) must be avoided. Make sure that the combustion air is supplied directly to the stove via a separate duct, alternatively via an extra air inlet through the outside wall. The stove should also have tightly closing doors.
Drying cabinets are directly connected to the ventilation system. Condensation tumble dryers do not affect the ventilation system. For evacuation tumble dryers contact the ventilation contractor. Cooker hoods should have a separate flue.

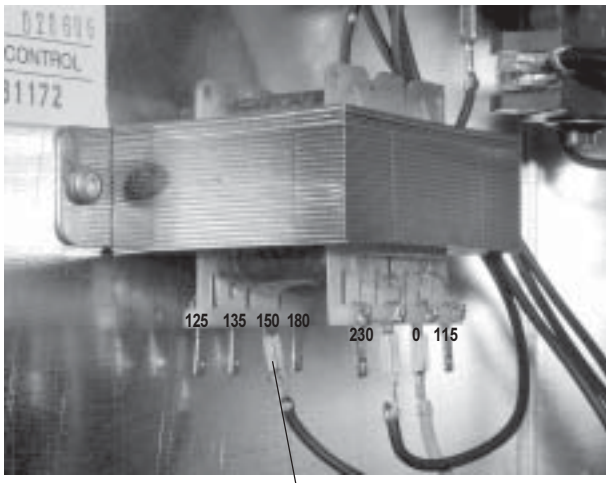
Adjusting the air flow
Must be carried out by the ventilation technician. For adjusting the correct air flow see the ventilation drawing.

Adjusting the ventilation

Fan capacity

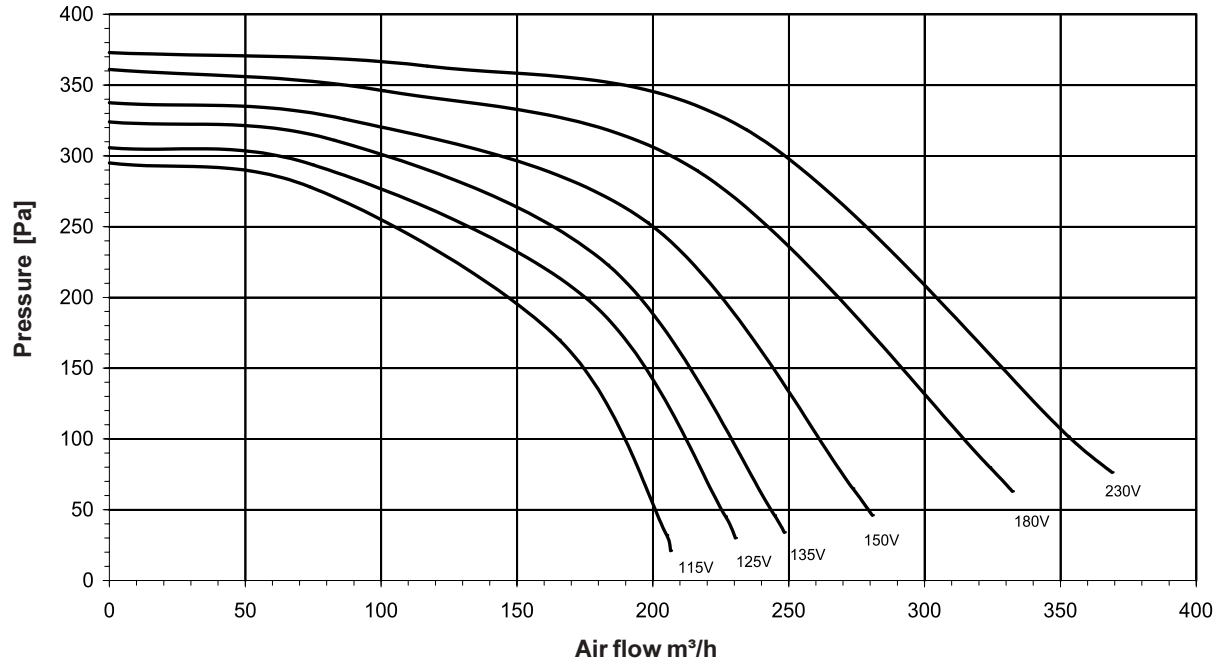
Available pressure for the ducting system: see the diagram.
To change the fan speed, move the fan transformer cable according to the marking on the transformer.

115V = Speed 1
125V = Speed 2
135V = Speed 3
150V = Speed 4
180V = Speed 5
230V = Speed 6

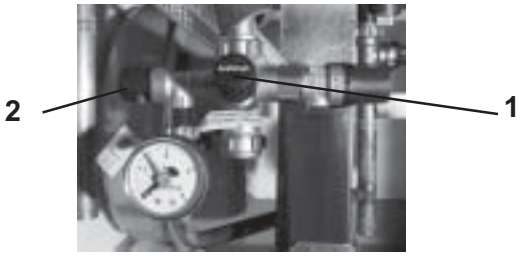


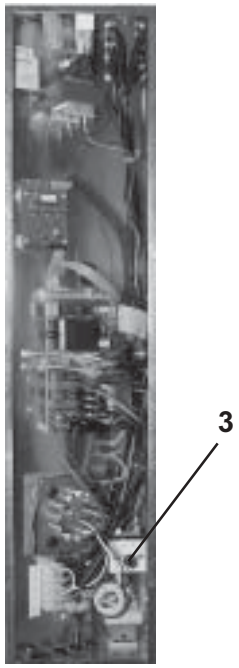
Move this cable (black)

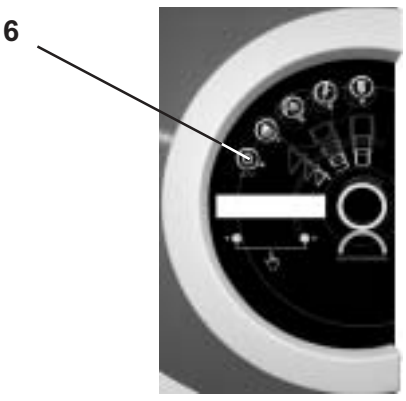
Diagram Pressure/Air flow



Commissioning







Commissioning

1. Open the main valve *(1)* to fill the hot water system.

NOTE: The hot water heater must always be filled and pressurised before the heating system is filled.

2. Fill the heating system by opening the filling valve *(2)*.

3. Vent the heating system by opening the nipple at the side of the heating system safety valve. Refill the system to the correct pressure. Normal pressure is 0.5 – 1.5 bar.

4. When the correct pressure is reached, close the filling valve *(2)*.

5. Remove the cover of the electrical box and set the thermostat *(3)* to a flow temperature of 35°C for floor heating (factory setting) or 45°C for a radiator system.

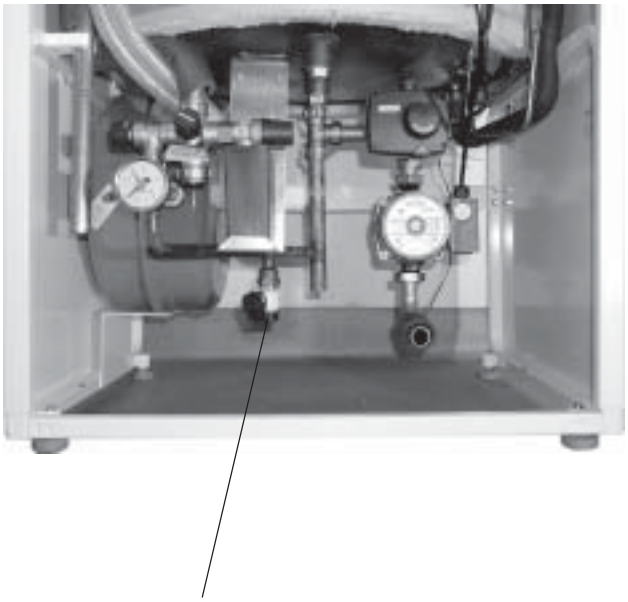
NOTE: For floor heating, a higher temperature must not be set than for the floor heating system in question. See the supplier's instructions.

6. Check that the manual control switch *(4)* is off. Turn the main switch to "1" *(5)*. Start the machine by pressing the on/off button on the display *(6)*.

7. The machine must be operated in manual mode until the air system has been adjusted or if there are problems with the machine. Set the manual switch to **"On"**. The control system is shut down and the water is heated to the temperature to which the thermostat *(3)* is set.

NOTE: Only an authorised engineer may change the setting of the thermostat *(3)*, otherwise the heating system may be severely damaged.

Draining



1. Drain valve

Draining the heating circuit

1. Electrically isolate the hot water cylinder by setting the main switch to 0 and removing the fuses of the circuit that supplies the unit.

NOTE: Never energise the unit when it does not contain water.

2. Release the pressure by opening the heating circuit's safety valve so that the pressure gauge reads 0 bar.

3. Then open the drain valve, which is in a T-piece to the right of the expansion vessel (1). Open by turning the dial anti-clockwise. The draining valve has a 1/2" external thread to which the hose to the drain can easily be attached.

4. To empty the machine of hot water, open the air nipple or safety valve.

Notes

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