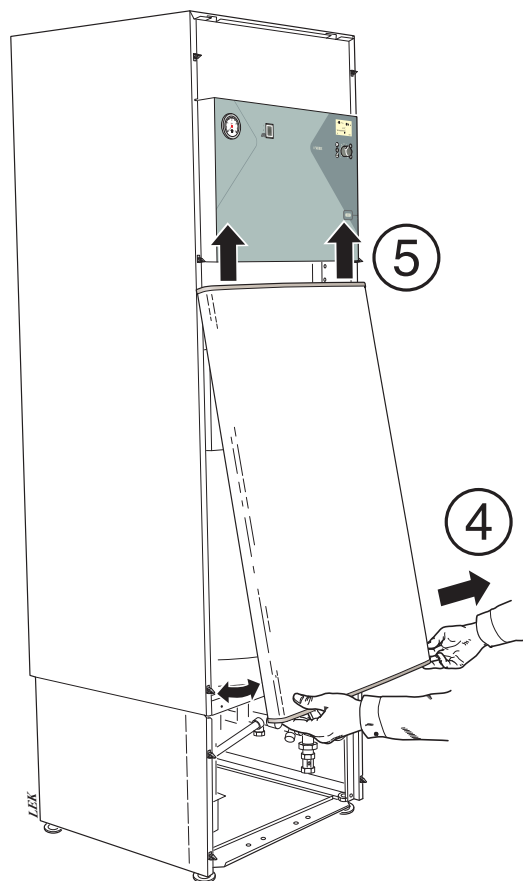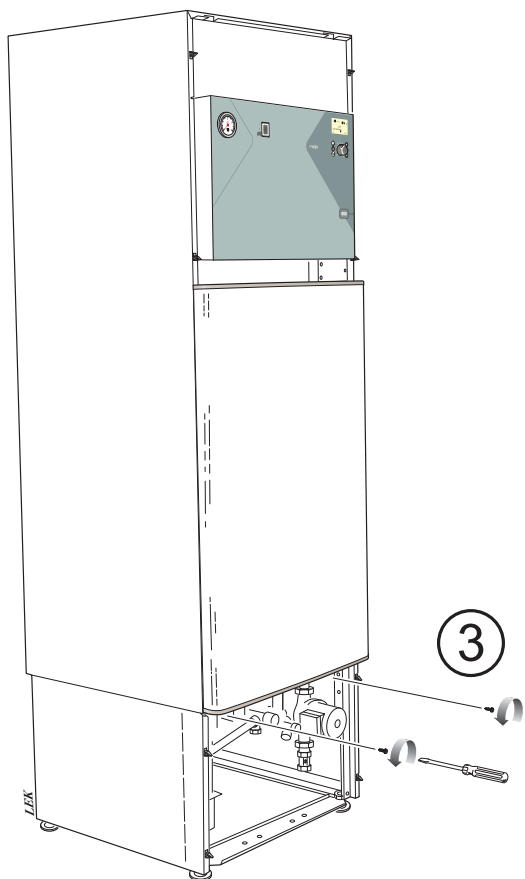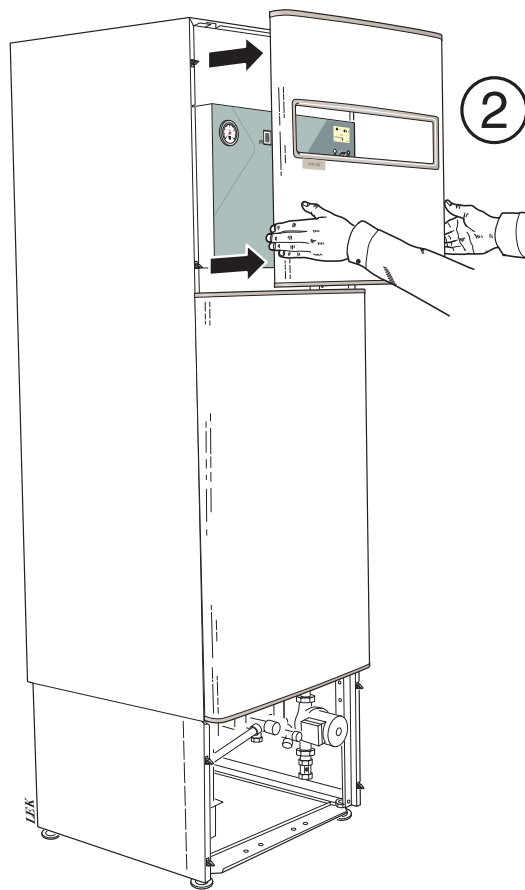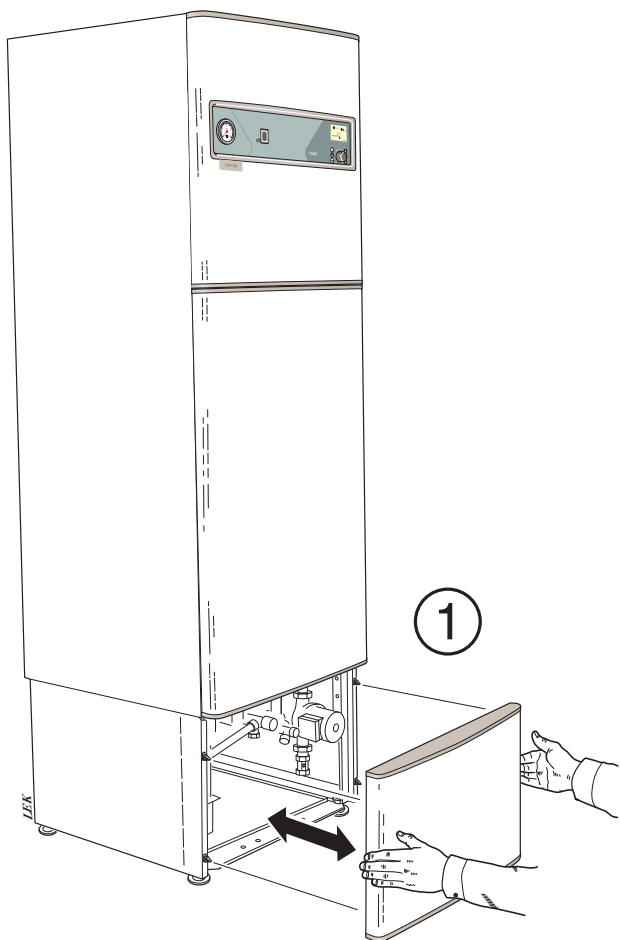MOS GB 1236-8
NIBE VVM 300
511815

INSTALLATION AND MAINTENANCE INSTRUCTIONS

# NIBE VVM 300
230 V

◆NIBE

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# User guide

## General

## Front panel

## Room temperature

## Maintenance routines

# Installation

## General information for the installer

## Pipe connections

## Service

## Electrical connections

## Commissioning and adjusting

# Miscellaneous

## Control

## Menu explanation

## Electrical circuit diagram

## Technical specifications

*In order to get the ultimate benefit from hot water module NIBE VVM 300 you should read through these Installation and Maintenance Instructions.*

*VVM 300 supplies the house with hot water and heating and controls F20XX optimally.*

*The intelligent controls ensure that VVM 300 always works as efficiently as possible.*

*VVM 300 is a Swedish manufactured quality product with a long service life.*

**To be filled in when the product has been installed**

| |
|---|
| **The serial number (103)**, must always be stated with all correspondence with NIBE. <br><br> 069_ _ _ _ _ _ _ _ _ _ |
| Installation date <br><br> |
| Installer <br><br><br><br> |
| Chosen max output, immersion heater <br><br> |
| Circulation pump setting (16), heating medium <br><br> |
| Menu setting 2.1, "Heat curve" <br><br> |
| Setting Offset heating curve <br><br> |
| <br><br> Date_____      Sign_____ |

## Principle of operation

VVM 300 is an electric boiler designed for houses with water borne heating. It consists of a double jacketed pressure vessel, two immersion heaters and advanced controls.

The total water volume is 280 litres, of which 125 litres are in the double jacketed space and 155 litres in the heater.

The hot water heater has a copper lining to protect against corrosion. The immersion heaters are in the double jacket.

The immersion heaters have a max output of 6.0 kW with option of setting lower outputs. The factory setting is 6.0 kW.

The charge pump in VVM 300 is speed controlled and adjusts the charge flow automatically.

VVM 300 is equipped with climate controlled automatic by-passes to maintain the correct temperature for the heating system. This temperature is determined by the actual outdoor temperature and selected basic settings.

VVM 300 is designed for connection and communication with F20XX. Sizes 6, 8 and 11 can be connected. F20XX and VVM 300 together make up a complete heating plant.

F20XX covers the entire heating and hot water requirement until the output requirement of the house exceeds the specified heat pump output. In the temperature zone between balance temperature and stop temperature, F20XX works together with VVM 300. If the outdoor air temperature drops down to a level below the stop temperature for F20XX, all heating occurs with VVM 300.

## Abbreviations

AV    Shut-off valve
FG    Flow line sensor
RG    Return line sensor
RC    Control valve
SF    Particle filter (Included in F20XX)
SÄV    Safety valve
TV    Drain valve
UG    Outside sensor

## System diagram



VVM 300
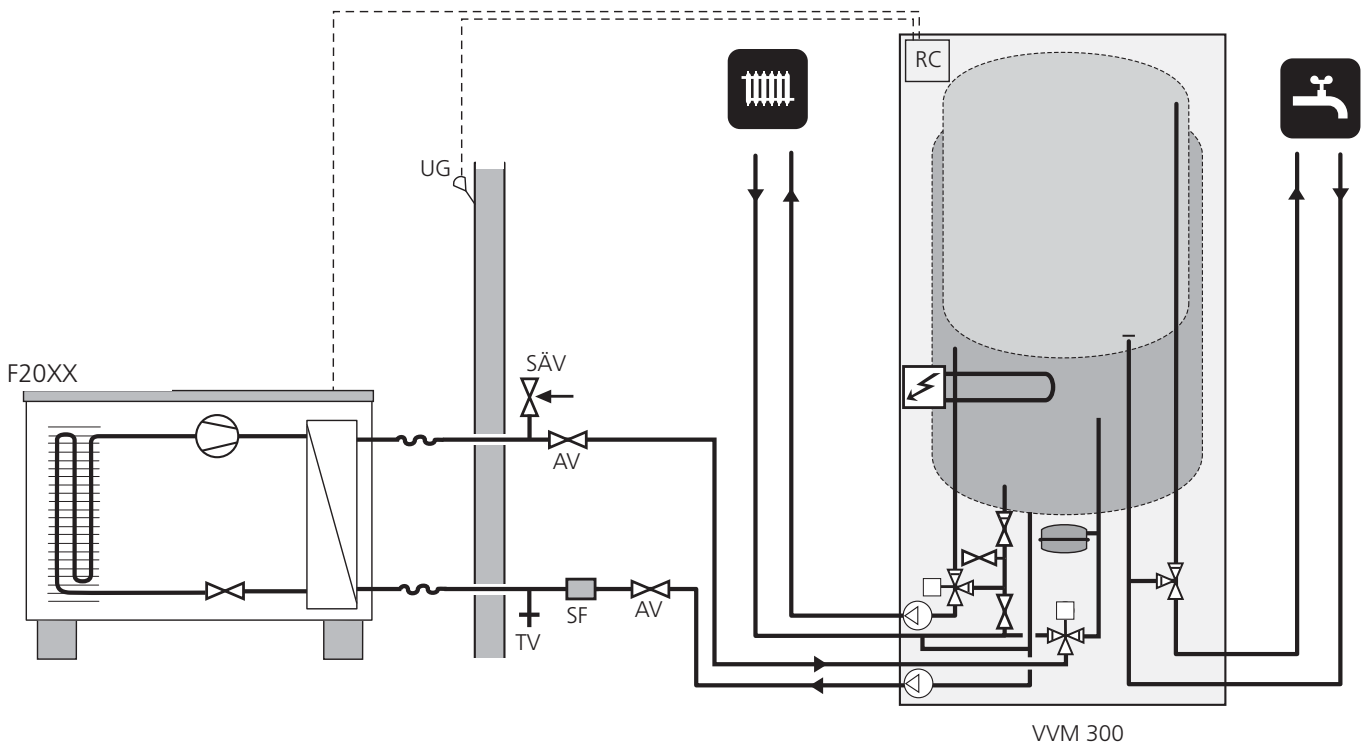
The heating medium side and the hot water side must be fitted with the necessary safety equipment in accordance with the applicable regulations.

**NOTE!** This is an outline diagram. Actual installations must be planned according to applicable standards.

# Front panel

Offset heating curve    Display

Pressure gauge    Switch    Left keypad    Right keypad
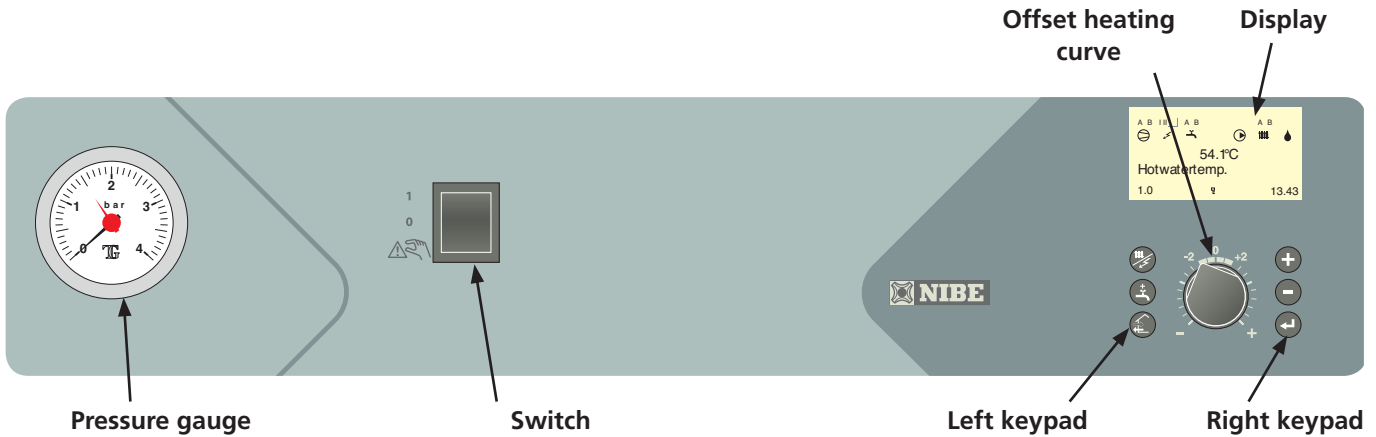
## Pressure gauge

The radiator circuit pressure is displayed here. Gauge graduation is 0 – 4 bar. Normal pressure is 0.5 – 1.5 bar when the system is closed.

## Switch

with three positions **1 – 0 – ⚠☝**

**1**    Normal mode. All control functions connected.

**0**    The boiler is completely switched off.

⚠☝    Standby mode. This mode is used in the event of operating disturbances. The immersion heater output is limited to 4 kW, the circulation pump (16) and charge pump (40) operate continuously.

## Display

**First row:**

**A B** **Compressor symbol**

**A** together with compressor symbol, is displayed when fan step 1 is in operation.

**B** together with compressor symbol, is displayed when fan step 2 is in operation.

The compressor symbol alone indicates that the compressor is to start, but is locked due to start conditions in the F20XX not being met internally, e.g. time conditions.

**I II** **Addition. heat symbol**

Indicates when the additional heater is connected. The line indicates which power step/steps are currently connected.

**I**    2 kW additional power is connected.

**II**    4 kW additional power is connected.

**A B** **Hot water symbol**

Indicates when the "Extra hot water" function is active.

**A** is shown when 3 hour temperature increase is activated.

**B** is shown when a time based temperature increase is activated, for example periodic.

**Circulation pump symbol**

Shown when the circulation pump in the heating system is in operation.

**Heating system symbol**

Shown when house heating with heat pump is in progress.

**Defrosting symbol**

Indicates when F20XX defrosting is in progress.

**Second row:** Value of the current parameter.

**Third row:** Description of current display parameter. "Hot water temp" is normally shown.

**Fourth row:** Shows information symbols.

1.0    Menu number.

P    Pool heating in progress.

⌸    Key lock activated.

## Offset heating curve

This knob is used to change the heating curve's parallel offset and in doing so the room temperature. Turning clockwise increases the room temperature. When the knob is turned menu 2.0 is shown on the display and the value for the calculated flow temperature changes.

Also see the section Room temperature.

## Right keypad

The **plus button** is used to scroll through the menu system (forwards) or increase the value of the selected parameter.

The **minus button** is used to scroll through the menu system (backwards) or lower the value of the selected parameter.

The **enter button** is used to select a lower menu in the menu system, to activate a parameter change as well as confirm a parameter change.

See the section "Control" – "General".

## Left keypad

**Operating mode**

This button is used to set the required operating mode with regard to permitting/blocking the circulation pump and additional energy. The change does not need to be confirmed with the enter button.

The current operating mode is shown on the display when the button is pressed and the mode changes when you continue to press the button. The display returns to the normal display mode once the enter button is pressed.

**With the heat pump connected the different operating modes are:**

**Auto mode:** VVM 300 automatically selects the operating mode with reference to the outdoor temperature. The circulation pump and the immersion heater are permitted to run as needed.

**Summer mode:** Only production of hot water using F20XX. The circulation pump and immersion heater are blocked. However, when "Extra hot water" is activated the immersion heater is connected.

**Spring/Autumn mode:** Only production of heating and hot water using F20XX. The circulation pump is operational. The immersion heater is disabled. However, when "Extra hot water" is activated the immersion heater is connected.

When there is a risk of freezing and summer mode or spring/autumn mode is selected, the operating mode is forced controlled into winter mode.

Freeze protection is displayed in menu 1.0.

Flow line limited to the set value in menu 2.3 (min. flow line).

**Extra Hot Water**

The "Extra hot water" function is activated for a period of 3 hours using this button. The change does not need to be confirmed with the enter button. At activation, the hot water temperature increases above the normal temperature, up to the set value.

**Return to menu 1.0**

## Key lock

A key lock can be activated by simultaneously pressing the plus and the minus buttons. The key symbol will then be shown on the display. The same procedure is used to deactivate the key lock.

# Room temperature

## Heating control system

The indoor temperature depends on several factors. During the hot season, solar radiation and heat given off by people and equipment are sufficient to keep the house warm. When it gets colder outside, the heating system must be started. The colder its gets, the hotter the radiators must be.

This adjustment is made automatically, however the basic settings must first be made on the boiler, see the section "Default setting".

## Default setting

The basic heating is set using menu 2.1 and with the "Heating curve offset" knob.

If you do not know the correct settings use the basic data from the map opposite.

If the required room temperature is not obtained, readjustment may be necessary.

**NOTE!** Wait one day between settings so that the temperatures have time to stabilise.



```
                      9
Heat curve
2.1
```
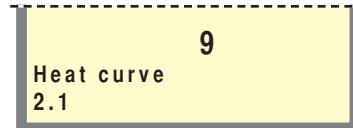
**Menu 2.1  Heat curve**
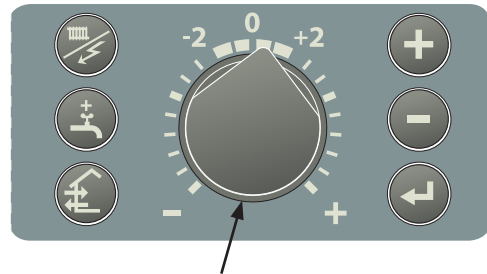


**Offset heating curve**

### Readjustment the default settings

#### Cold weather conditions

When the room temperature is too low, the "Heating curve" value is increased in menu 2.1 by one increment.

When the room temperature is too high, the "Heating curve" value is decreased in menu 2.1 by one increment.

#### Warm weather conditions

If the room temperature is low, increase the heating curve offset setting by one step.

If the room temperature is high, reduce the "Heating curve offset" setting by one step.

## Changing the room temperature manually

If you want to temporarily or permanently lower or raise the indoor temperature relative to the previously set temperature, turn the "Heating curve offset" knob anticlockwise or clockwise. One to three lines approximately represents a one degree change in room temperature.

**NOTE!** An increase in the room temperature may be inhibited by the radiator or underfloor heating thermostats, if so these must be turned up.

## Setting with diagrams

The heating control system on VVM 300 is controlled by the outside temperature. This means the flow temperature is regulated in relation to the current outdoor temperature.

The diagram is based on the dimensioned outdoor temperature in the area and the dimensioned supply temperature of the heating system. When these two values "meet", the heating control's curve slope can be read. This is set under menu 2.1, "Heating curve".

A suitable value is set using the knob on the front panel, "Offset heat curve". A suitable value for underfloor heating is -1 and for radiator systems -2.
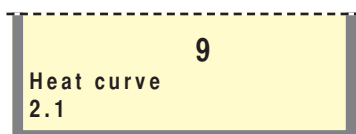


**Menu 2.1  Heat curve**
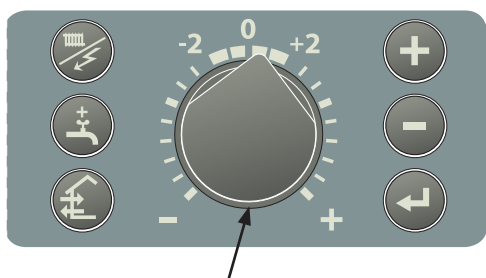


Offset heating curve

---

**NOTE!**

*"Heating curve" in menu 2.1 and "Max supply temp." in menu 2.4 are adjusted according to the heating system in question.*

---

**Shifting the heating curve -2**
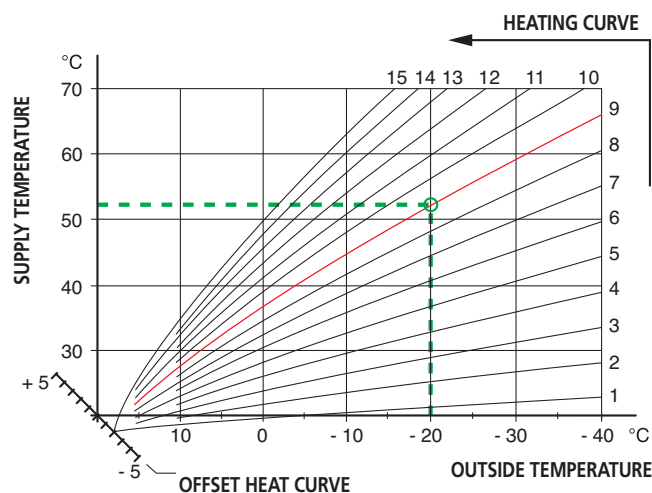


**Shifting the heating curve 0**
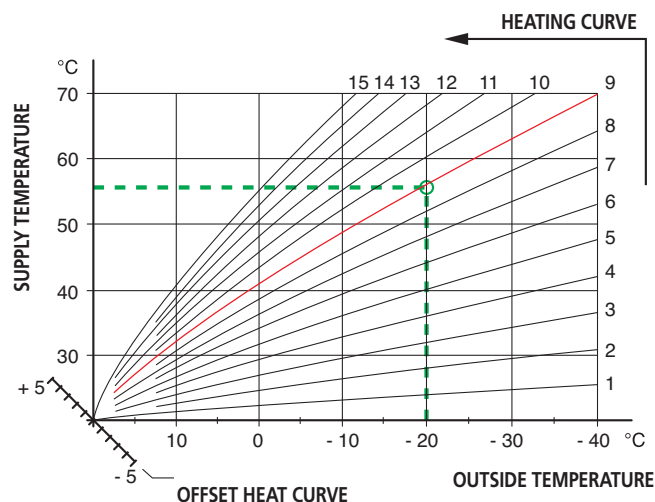


**Shifting the heating curve +2**
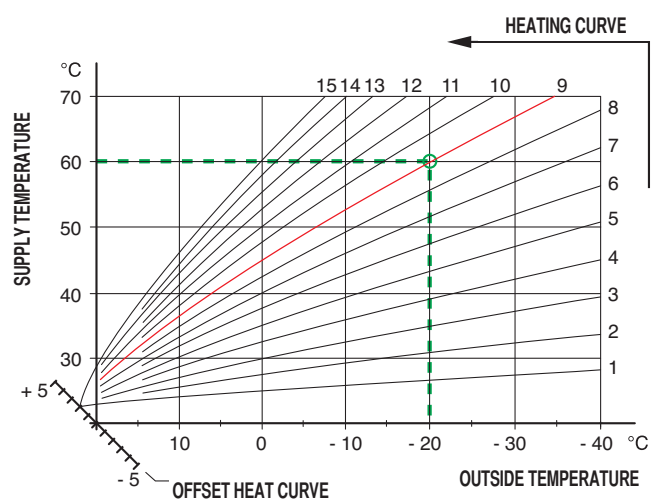
# Maintenance routines

## Checking the safety valves
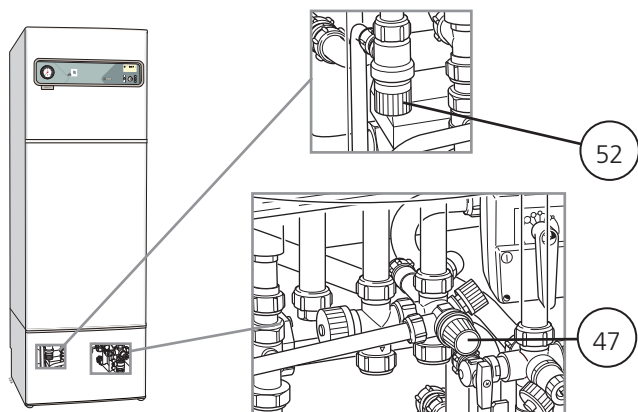


VVM 300 has two safety valves, one for the heating system and one for the hot water heater.

The heating system's safety valve (52) must be completely tight, but the heater's safety valve (47) may occasionally release some water after hot water has been used. This is because the cold water, which enters the heater to replace the hot water, expands when heated causing the pressure to rise and the safety valve to open.

The safety valves must be checked regularly. Check one valve at a time as follows:

■ Open the valve.

■ Check that water flows through the valve.

■ Close the valve again.

■ The heating system may need to be refilled after checking the safety valve (52), see the section "Commissioning and adjustment" – "Filling the heating system".

## Pressure gauge
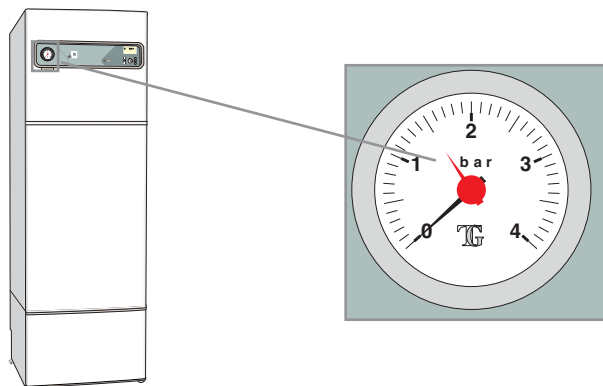


The working range of the heating system is normally 0.5 – 1.5 bar when the system is closed. Check this on the pressure gauge (42).

*In the event of malfunction or operating disturbances first check the points below:*

## Low temperature or a lack of hot water

- Air in boiler or system.
- Large amounts of hot water were used.
- Circuit or main MCB tripped.
- Possible earth circuit-breaker tripped.
- Mixer valve set too low (45).
- Switch (8) set to "0".
- Tripped Miniature circuit-breaker (7) or Fine-wire fuse (33). See "Dealing with malfunctions" – "Resetting the miniature circuit breakers".
- Tripped temperature limiter (6). (Contact service)
- Closed or throttled filler valve (46) to the heater.
- External control may have blocked the electrical output.
- Incorrectly set values for hot water production.

## High hot water temperature

- Mixer valve set too high.
- Incorrectly set values for hot water production.

## Low room temperature

- Air in boiler or system.
- Circuit or main MCB tripped.
- Possible earth circuit-breaker tripped.
- Tripped Miniature circuit-breaker (7) or Fine-wire fuse (33). See "Dealing with malfunctions" – "Resetting the miniature circuit breakers".
- Tripped temperature limiter (6). (Contact service)
- Automatic heating control system settings not correct.
- 24 hour setting incorrectly set so that night reduction is active during the day.
- Circulation pump (16) stopped. See the section "Dealing with malfunctions" – "Starting the pump".
- Close valves (44) and (50) in the radiator circuits.
- Initial pressure in expansion vessel too low. This is indicated by low pressure on the pressure gauge (42). Contact the installer.
- External control may have blocked the electrical output.

## High room temperature

- Incorrect values set on the automatic heating control system.

*If the operating disturbance cannot be rectified by means of the above an installation engineer should be called. If necessary set the switch to" ⚠🖐 ". See the section, "Switch position " ⚠🖐 ".*

## Switch position " ⚠🖐 "
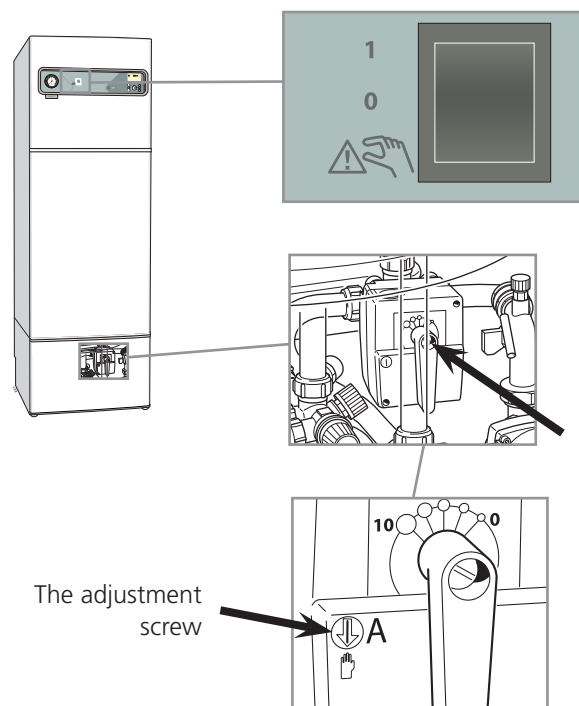


In mode " ⚠🖐 " the boiler's electronic controls are disconnected, the display window is not lit.

The immersion heater is controlled by a separate thermostat. Available output in standby mode is 4 kW.

The automatic heating control system is not operational, so manual shunt operation is required. This is done by turning the adjustment screw to "manual mode" and then turning the shunt knob to the desired position.

The circulation pump (16) and charge pump (40) are in continuous operation.

The adjustment screw

NOTE!

*When returning to normal mode do not forget to reset the shunt knob to its original position by turning the adjustment screw to "A".*

**Dealing with malfunctions**

## Alarm/alarm outputs

Other information can also be shown on the display besides the standard information. This applies with malfunctions or for calls to take action. This type of information is only shown in menu 1.0 (The display always automatically returns to menu 1.0 approximately 30 minutes after the last button was pressed). This information alternates with menu 1.0's standard information. At the same time the display's background lighting flashes. When the cause of the error is adressed zero the alarm in menu 9.3.6.

The following information can be shown:

```
LOW FLUID TEMP.
1.0
```

### LOW PRESSURE

This information is shown when the low pressure switch in F20XX has tripped. This may be due to a frozen evaporator or reduced air flow through the evaporator. Indicated as 05 in channel 00 on F20XX. (VVM 300 switches to reduced boiler mode*.)

The information will disappear when the cause of the error is addressed and F20XX and VVM 300 is re-started or when the alarm is acknowledged in menu 9.3.6.
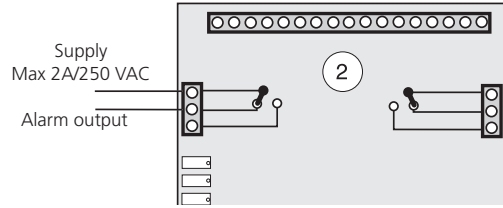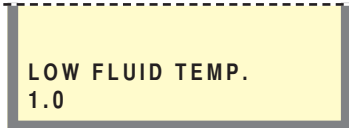
```
HIGH PRESSURE
1.0
```

### HIGH PRESSURE

This information is shown when the high pressure switch in F20XX has tripped. This may be due to too low charge flow or air in the system. Indicated as 06 in channel 00 on F20XX. (VVM 300 switches to reduced boiler mode*.)

The information will disappear when the cause of the error is addressed and F20XX and VVM 300 is re-started or when the alarm is acknowledged in menu 9.3.6.

```
MOTOR SECURITY
1.0
```
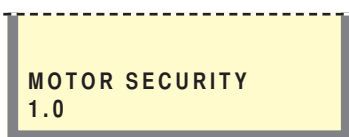
### MOTOR SECURITY

This information is shown when the motor protection in F20XX has tripped. The alarm may be due to dropped phase because of tripped fuses or incorrectly set motor protection. Indicated as 07 in channel 00 on F20XX. (VVM 300 switches to reduced boiler mode*.)

The information will disappear when the cause of the error is addressed and F20XX and VVM 300 is re-started or when the alarm is acknowledged in menu 9.3.6.



Supply
Max 2A/250 VAC

Alarm output

In the event of an alarm the relay contact closes

```
SENSOR ALARM
1.0
```
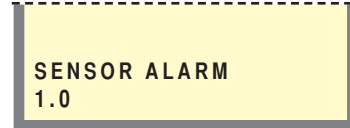
### SENSOR ALARM

This information is shown when a temperature sensor in F20XX stops working. This may be due to an open-circuit or incorrect installation. Indicated as 08 in channel 00 on F20XX. (VVM 300 switches to reduced boiler mode*.)

The information will disappear when the cause of the error is addressed and F20XX and VVM 300 is re-started or when the alarm is acknowledged in menu 9.3.6.

```
REPLACED SENSOR
1.0
```
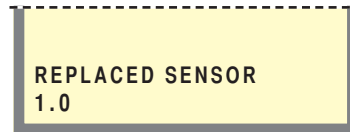
### REPLACED SENSOR

This information is displayed when sensors in F20XX are incorrectly installed. Indicated as 12 in channel 00 on F20XX. (VVM 300 switches to reduced boiler mode*.)

The information will disappear when the cause of the error is addressed and F20XX and VVM 300 is re-started or when the alarm is acknowledged in menu 9.3.6.

```
COMM ALARM
1.0
```
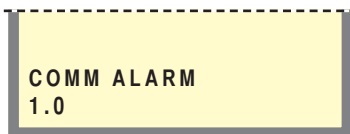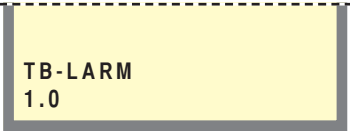
### COMM ALARM

Error text is displayed when contact between VVM 300 and F20XX is lost. This may be due to a wiring short-circuit or lost power to F20XX. (VVM 300 switches to reduced boiler mode*.)

The information will disappear when the cause of the error is addressed and F20XX and VVM 300 is re-started or when the alarm is acknowledged in menu 9.3.6.

NOTE! VVM 300 must be powered within 5 minutes after F 20XX restarts and communication between the products is resumed. VVM 300 switches to reduced boiler mode*.

* Means that the compressor is blocked and the flow temperature is forced to the set minimum temperature in (menu 2.3). To switch to normal electric boiler mode: Ensure that "Add.heat beg" appears in the display by pressing the operating mode button. Then press the operating mode button again until "Add.heat" appears in the display.

```
TB-LARM
1.0
```

**TB-LARM**

Shown when any temperature limiter has tripped. The cause of the fault may be that VVM 300 has been started without the boiler section being filled with water. The temperature limiter may have tripped during transportation of VVM 300, . To reset, see "Electrical connection – Resetting the temperature limiter". The information disappears when the fault is remedied and VVM 300 has been restarted.

```
SENSOR ALARM HW
1.0
```

**SENSOR ALARM HW**

This information is shown when a fault on the hot water temperature sensor has been registered. The alarm may be due to faulty sensors or a broken sensor cable. The information disappears when the fault is remedied and VVM 300 has been restarted.

```
SENSOR ALARM HM
1.0
```

**SENSOR ALARM HM**

This information is shown when a fault on the flow temperature sensor has been registered. The alarm may be due to faulty sensors or a broken sensor cable. The information disappears when the fault is remedied and VVM 300 has been restarted.

```
SENSOR ALARM EP
1.0
```

**SENSOR ALARM EP**

This information is shown when a fault on the immersion heater temperature sensor has been registered. The alarm may be due to faulty sensors or a broken sensor cable. The information disappears when the fault is remedied and VVM 300 has been restarted.

## Resetting the temperature limiter

The temperature limiter (6) is accessible from behind the centre front cover and is positioned under the inner protective cover.

The temperature limiter is reset by firmly pressing in its button. The button can be accessed from the underside of the distribution box. The cover on the distribution box does not need to be removed when resetting.
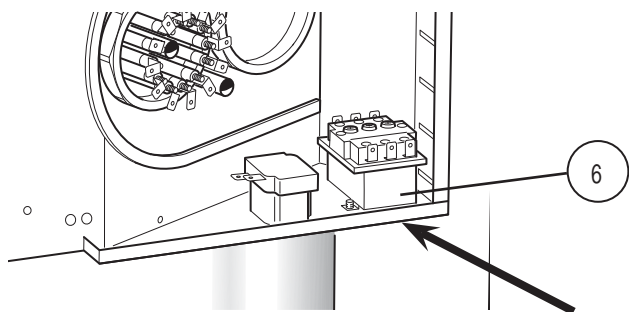


## Helping the circulation pump to start

- Switch VVM 300 off by setting the switch (8) to "0".
- Remove the lower front cover.
- Loosen the venting screw with a screwdriver. Hold a cloth around the screwdriver blade as a certain amount of hot water may run out.
- Insert a screwdriver and turn the pump rotor.
- Screw in the venting screw.
- Start VVM 300 and check whether the circulation pump runs.

It is usually easier to start the circulation pump with VVM 300 running, switch (8) set to "1". If helping the circulation pump to start is performed with VVM 300 running, be prepared for the screwdriver to jerk when the pump starts.



**Venting screw**
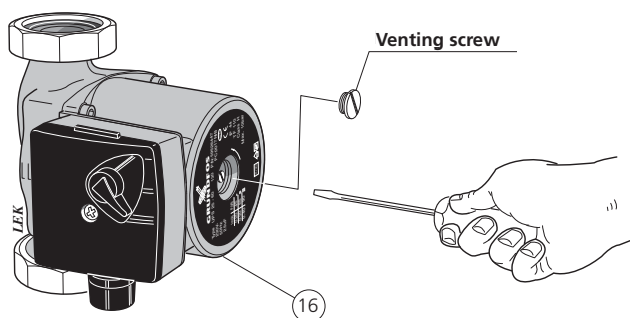
## Resetting the miniature circuit breakers

The MCB (7) is accessible behind the upper front access panel and is located to the right of the panel.

Normal mode of the miniature circuit-breaker is "1" (up).
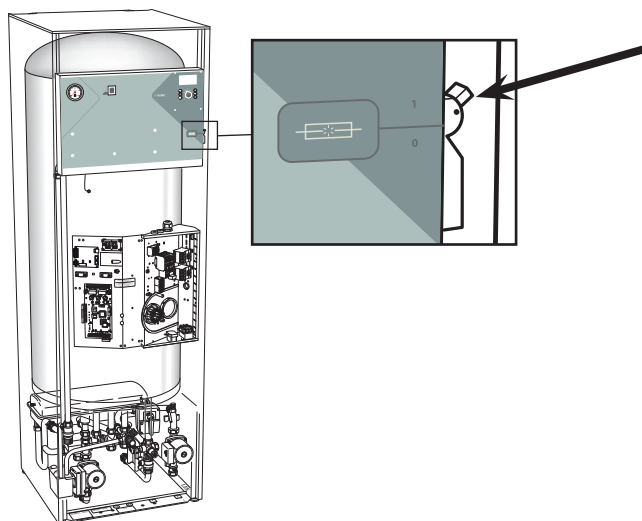
# General information for the installer

## Transport and storage

VVM 300 must be transported and stored upright and dry. The VVM 300 may, however, be carefully laid on its back when being moved into a building.

## Maximum boiler and radiator volumes

The volume of the expansion vessel (85) is 12 litres and it is pressurised as standard to 0.5 bar (5 mvp). As a result, the maximum permitted height "H" between the vessel and the highest radiator is 5 metres; see figure.

If the standard initial pressure in the pressure vessel is not high enough it can be increased by adding air via the valve in the expansion vessel. The initial pressure of the expansion vessel must be stated in the inspection document.

Any change in the initial pressure affects the ability of the expansion vessel to handle the expansion of the water.

The maximum system volume excluding the boiler at 80 °C is 140 litres at the above initial pressure.
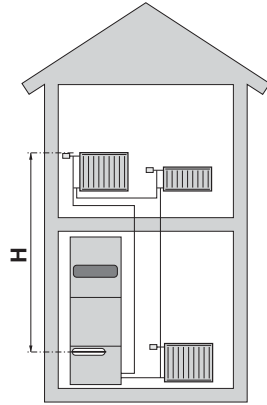
## Erecting the heat pump

It is recommended to install the electric boiler in a room with existing floor drainage, most suitably in utility room boiler room.

The unit can be aligned using the adjustable feet.

Route pipes so they are not fixed to an internal wall that backs on to a bedroom or living room.

## Inspection of the installation

Current regulations require the heating installation to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person and should be documented. The above applies to installations with a closed expansion vessel. If the electric boiler or the expansion vessel is replaced, the installation must be inspected again.

## Electric boiler mode

VVM 300 can be set in electric boiler mode from here. This mode means the heat pump is blocked, but all other components function as normal. This mode can be activated if a fault is discovered with the heat pump or if the heat pump is not installed. No other mode can be activated during electric boiler mode.

### Electric boiler operation without heat pump connected

■  Select "Service" in menu 8.1.1.
■  **Select "Off" in menu 9.3.13 directly after start up to prevent the charge pump from running.**

**NOTE!**

*If F20XX is not docked, the charge pump (40) will suffer damage when running.*

■  Select "0" in menu 9.1.2.
■  Select "Yes" in menu 9.3.2.

### Electric boiler operation with heat pump connected

■  Select "Service" in menu 8.1.1.
■  Select "0" in menu 9.1.2.
■  Select "Yes" in menu 9.3.2.

### Standby mode " ⚠ "

**Note! The charge pump (40) will run continuously in this mode.**

If the outdoor sensor is not connected, this mode should be used. In mode " ⚠ ", electronic control is disconnected. The display is off.

The automatic heating control system is not operational, so manual shunt operation is required. This is done by turning the adjustment screw to "manual mode" and then turning the shunt knob to the desired position.

The immersion heater output is limited to 4 kW and the circulation pump (16) and charge pump (40) operate continuously.
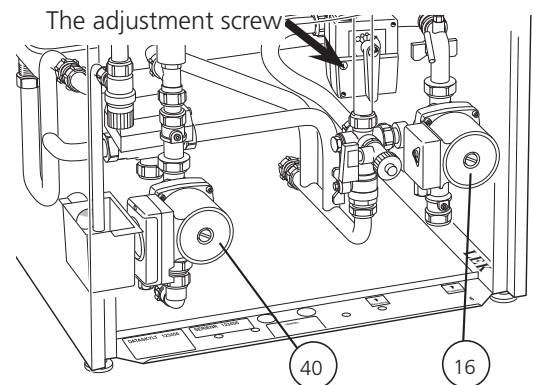
**NOTE!**

*When returning to normal mode do not forget to reset the shunt knob to its original position by turning the adjustment screw to "A".*

# Pipe connections

## General

Pipe installation must be carried out in accordance with current norms and directives.

**NOTE!** When the circulation pump is running, the flow in the radiator circuit must not be completely stopped. In other words, in a system where the radiator flow might stop because all thermostat valves are closed, there must be a bypass valve to protect the circulation pump.

Total volume is 280 litres with 155 litres in the hot water heater and 125 litres in the double jacketed space.

The pressure vessel in VVM 300 is approved for max 9.0 bar (0.9 MPa) in the heater and 2.5 bar (0.25 MPa) in the double jacket space.

An overflow pipe should be routed from the overflow cup (99) to an appropriate drain. The dimension of the overflow pipe must be the same as the waste water pipe, Ø 32 (98) and be routed downwards to prevent water pockets and to be frost proof. The outlet of the overflow pipe should be visible. See applicable norms.

> ## NOTE!
>
> *The pipe work must be flushed before the electric boiler is connected, so that any contaminants do not damage the components parts.*

## Pipe connection of the heating system and hot water

Pipe connection for VVM 300 is carried out as follows. Connect flow line, radiator circuit (70) and return line, radiator circuit (71) to the heating system.

Connect cold water connection (73) and hot water outlet from heater (74) to the hot water pipe. If F20XX is not to be connected (75) and (76) must be plugged.
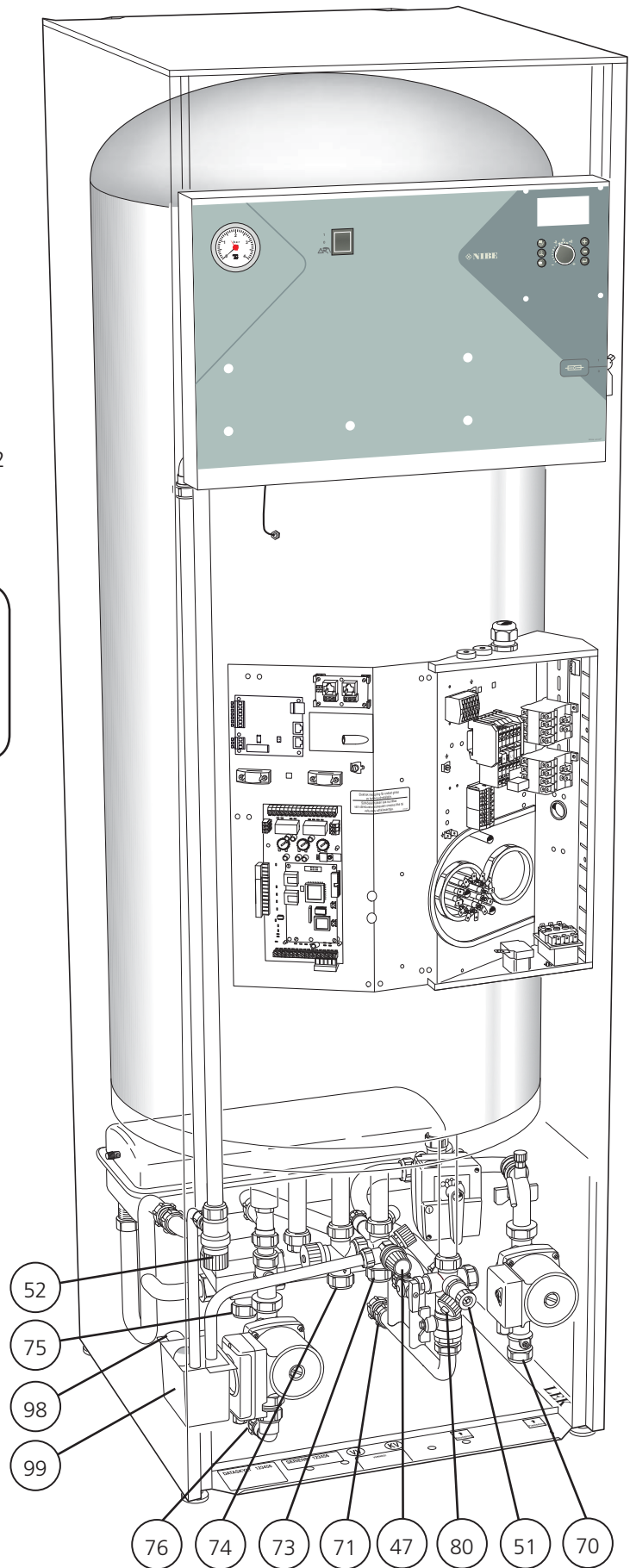
## Docking

The safety equipment must be installed in accordance with current regulations for all docking options. See www.nibe.com/docking for more docking options.

**VVM 300 docked to F20XX**
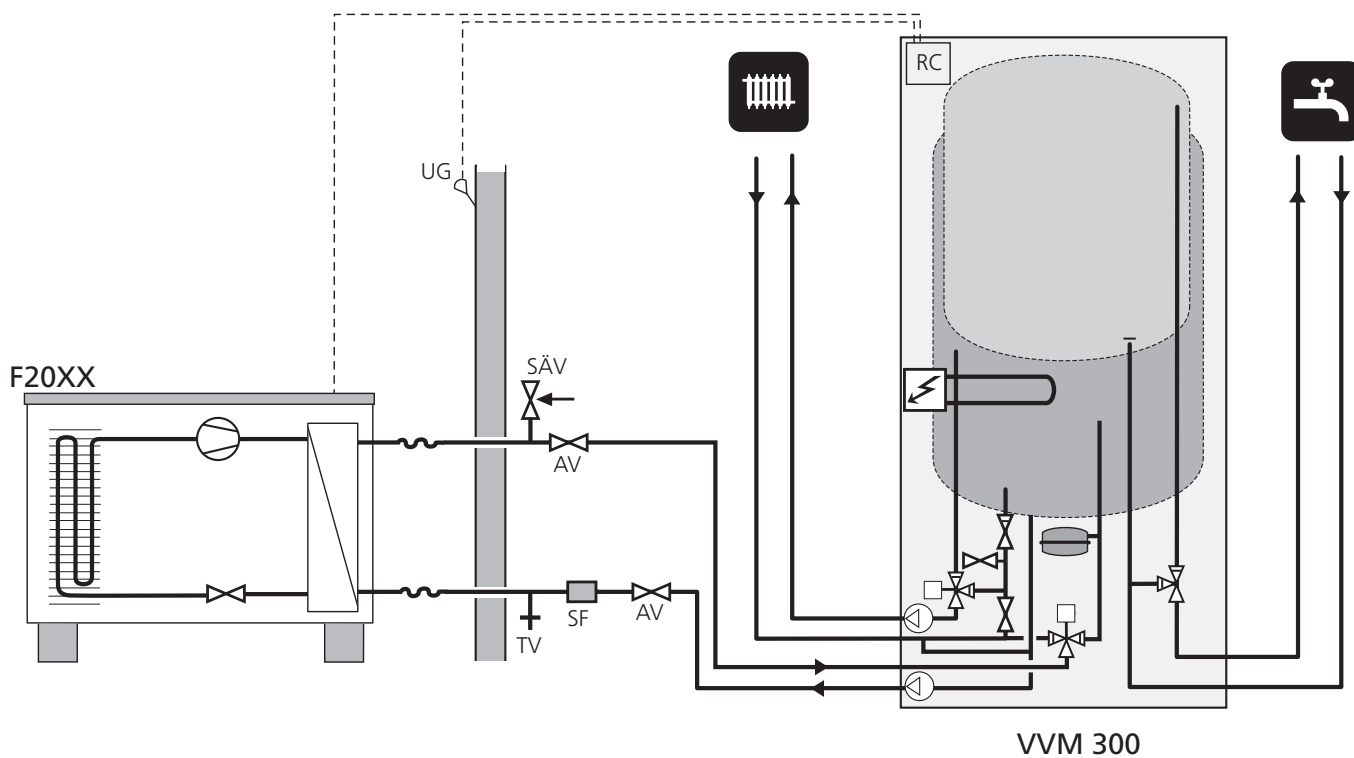


VVM 300 controls F20XX, which runs with floating condensation towards the heating system.

If F20XX cannot meet the heating requirement, additional heat is shunted in from VVM 300. When the outside temperature drops below the set stop temperature VVM 300 engages and takes over the heating.

**Abbreviations**

| | |
|---|---|
| AV | Shut-off valve |
| FG | Flow line sensor |
| RG | Return line sensor |
| RC | Control valve |
| SF | Particle filter (Included in F20XX) |
| SÄV | Safety valve |
| TV | Drain valve |
| UG | Outside sensor |

**Pipe connections**

**F20XX docked to VVM 300 with buffertank**



F20XX

UG

SÄV

AV

SF    AV

TV

UKV

RC
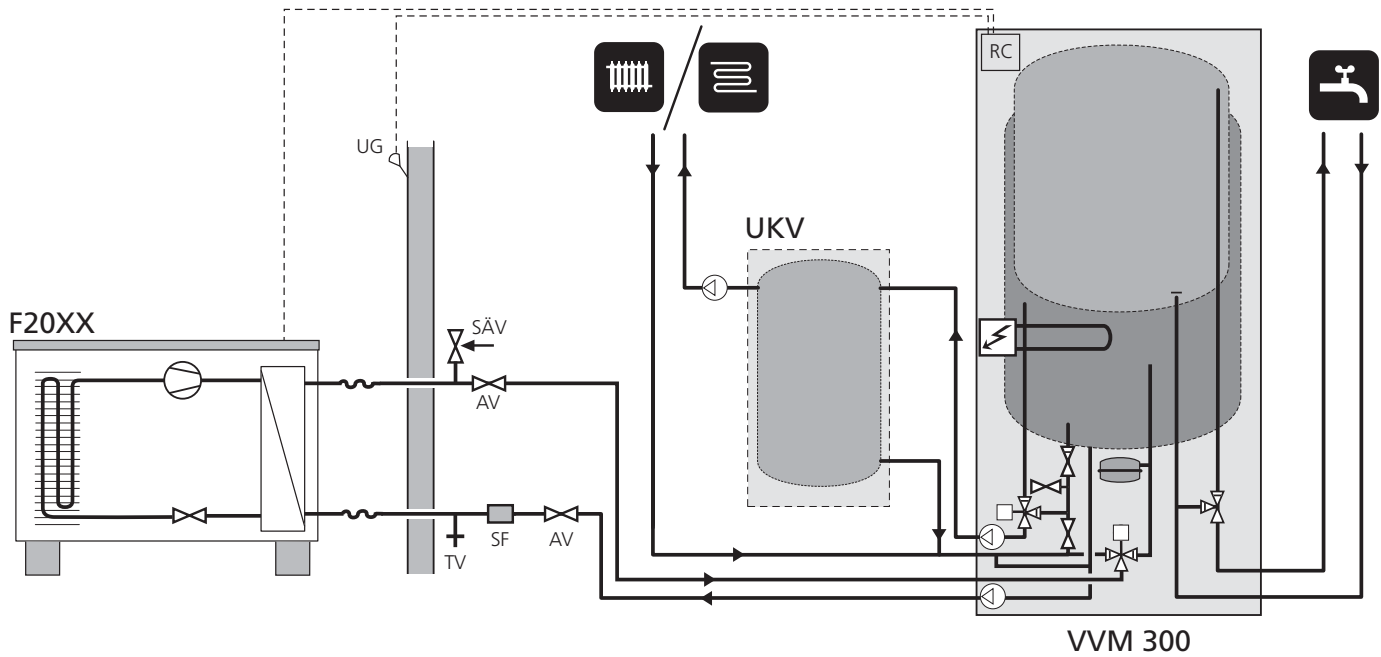
VVM 300

F20XX 6 kW, 8 kW and 10 kW (not 14 kW) can be con-
nected to VVM 300. F20XX is controlled by VVM 300.
F20XX works using floating condensation in the direction
of the heating system and prioritises hot water charging
in VVM 300. Depending on the outdoor air temperature
and heating requirements, F20XX uses either fan step 1
or fan step 2. (F2025 - 6 kW fan step 1 only.)

If F20XX cannot meet the heating requirement, additio-
nal heat is shunted in from VVM 300. When the outdoor
temperature drops below the set stop temperature VVM
300 engages and takes over the heating.

Note! In cases where the system volume in the radiator
circuit is below 200 l and/or the radiator flow is choked
uncontrolled, a UKV tank is installed as a volume and
flow increaser.

**Abbreviations**

| | |
|---|---|
| AV | Shut-off valve |
| FG | Flow line sensor |
| RG | Return line sensor |
| RC | Control valve |
| SF | Particle filter (Included in F20XX) |
| SÄV | Safety valve |
| TV | Drain valve |
| UG | Outside sensor |

## Pipe connection between VVM 300 and F20XX

Heat medium from F20XX (VB-out) connected to (75), charge connection from F20XX on VVM 300. Heat medium to F20XX (VB-in) connected to (76), charge connection to F20XX on VVM 300. Requisite safety equipment connected to F20XX and VVM 300, see section, docking. If F20XX is not to be connected, (75) and (76) must be plugged and charge pump (40) disabled. See the section "General information for the installer" – "Electric boiler mode".



Heating medium from F20XX (VB-out)

Heating medium to F20XX (VB-in)

F20XX



VVM 300
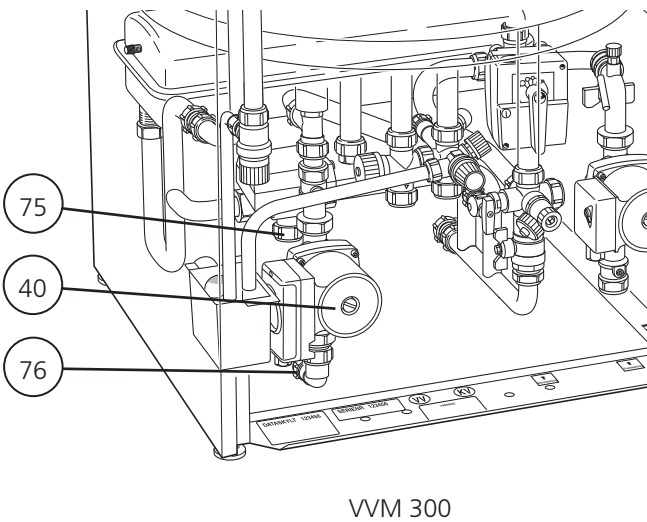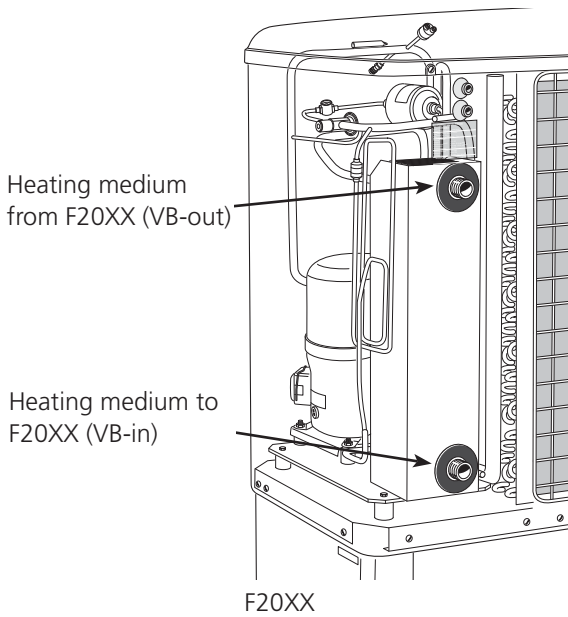
## Capacity diagram, heating medium pump

Max flow: 1700 l/h
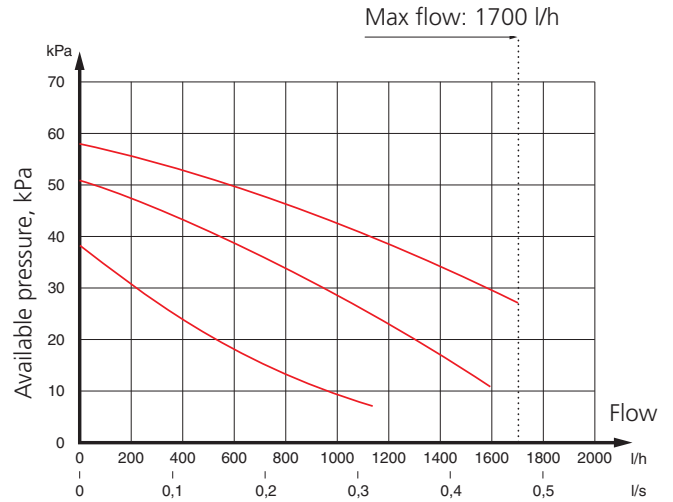


## Capacity diagram, charge pump
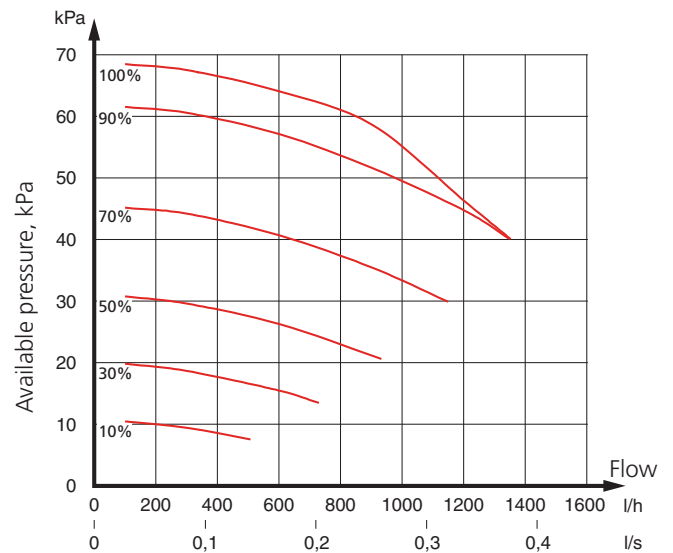
# Service

## Draining the heating system

The hot water can be drained off through drain valve (51) using an R15 (1/2") hose coupling. Remove the cover (80) from the valve. Now screw on the hose coupling and open valve (51).

Open safety valve (52) to let air into the system.

## Emptying the hot water heater

To empty the heater proceed as follows:

■ Disconnect the overflow pipe from the drain connection (79) and connect a hose to a draining pump instead. Where no draining pump is available, the water can be released into the overflow cup (99).

■ Open the safety valve (47).

■ Open a hot water tap to let air into the system. If this is not enough, undo a pipe coupling (74) on the hot water side and pull out the pipe.

# Electrical connections

### Connection

VVM 300 must be installed via an isolator switch with a minimum breaking gap of 3 mm. When the building is equipped with an earth-fault breaker, VVM 300 should be equipped with a separate one. Other electrical equipment, except the outdoor sensor and the current sensors, are connected at the factory.

Disconnect the electric boiler before insulation testing the house wiring.

> **NOTE!**
>
> *The switch (8) must not be moved from "1" or " ⚠ " until the boiler has been filled with water. Otherwise the temperature limiter, thermostat, compressor and the immersion heater can be damaged.*

The electric boiler is connected by the protruding cable via circuit breaker. Connection must not be carried out without the permission of the electricity supplier and under the supervision of a qualified electrician. The cable entry conduit is dimensioned for cable with a max Ø 19 mm.

The power is controlled via a contactor which is operated by a microprocessor.

The temperature limiter (6) cuts off the supply to the immersion heater if the temperature rises to between 90 and 100°C; it can be manually reset by pressing the button on the temperature limiter.

> **NOTE!**
>
> *Reset the temperature limiter, it may have tripped during transportation.*

The automatic heating control system, circulation pump (16), charge pump (40) and its cabling, are internally fuse protected with a miniature circuit breaker (7).

> **NOTE!**
>
> *Electrical installation and service must be carried out under the supervision of a qualified electrician. Electrical installation and wiring must be carried out in accordance with the stipulations in force.*
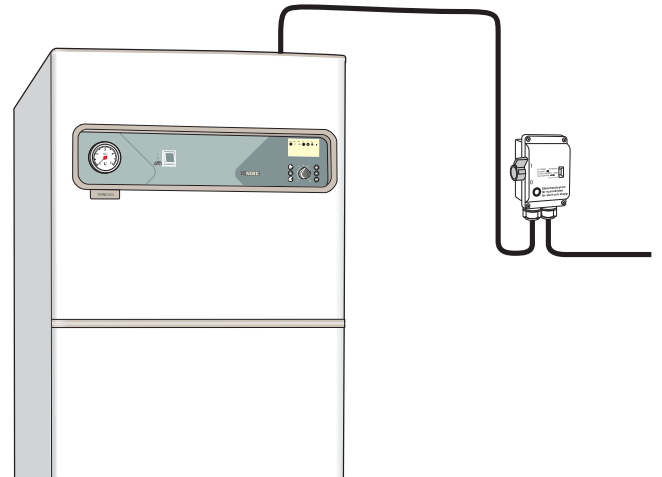
### Access to the lower electrical connections

Remove the upper and lower front cover. Open the centre front cover by removing the two screws at the lower edge. The load monitor card (2) and CPU card (34) can now be accessed on the left-hand side. Remove the protection plate by loosening the four screws to gain access to the right-hand side.
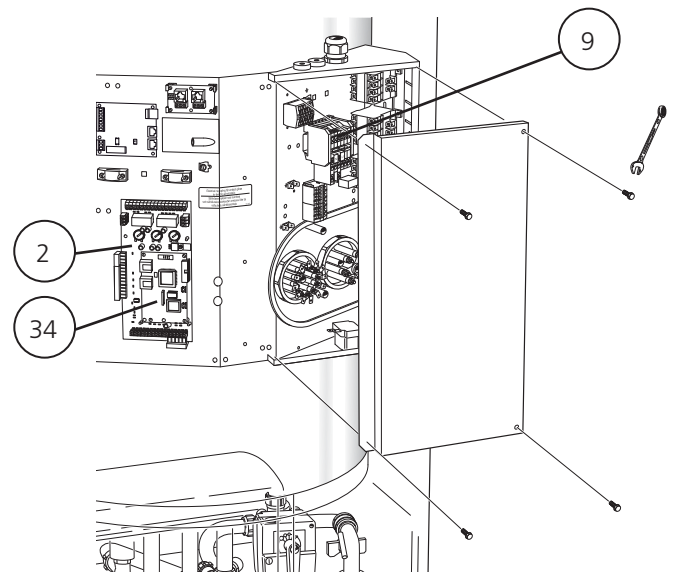
> **NOTE!**
>
> *Work behind covers secured by screws may only be carried out under the supervision of a qualified installation engineer.*

## Electrical connections

### Communication cable between VVM 300 and F20XX

A shielded three-wire cable is used for communication between VVM 300 and F20XX. The communication cable is connected between VVM 300 position (4) and F20XX position (44), see relevant Installation and Maintenance Instructions. The communication cable in F20XX should be routed from behind through the cable glands on the heat pump's left-hand side, seen from the rear. The communication cable in VVM 300 should be routed through the HP pipe, Ø 25, to the left and down to the left-hand front edge.

> **NOTE!**
>
> *To prevent interference, sensor cables and communication cables must be separated (min 20 cm) from high voltage cable when cable routing.*



F20XX backside

VVM 300



NIBE F20XX

NIBE F2026

VVM 300



VVM 300



F20XX

VVM 300



F20XX

| | F20XX | | VVM 300 | |
| --- | --- | --- | --- | --- |
| A+ | 44 | | 4 | X3A |
| B- | | | | X3B |
| GND | | | | X3GND |

| | F2026 | | VVM 300 | |
| --- | --- | --- | --- | --- |
| | -X5 | | 4 | |
| | 3 | | | X3A |
| | 4 | | | X3B |
| | 5 | | | X3GND |
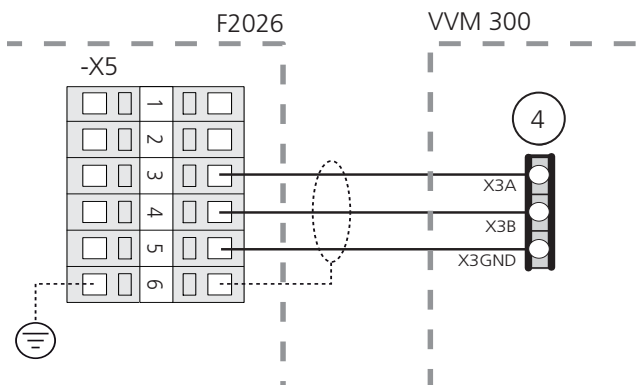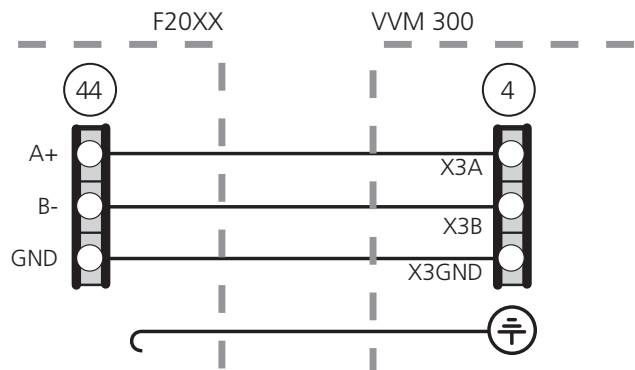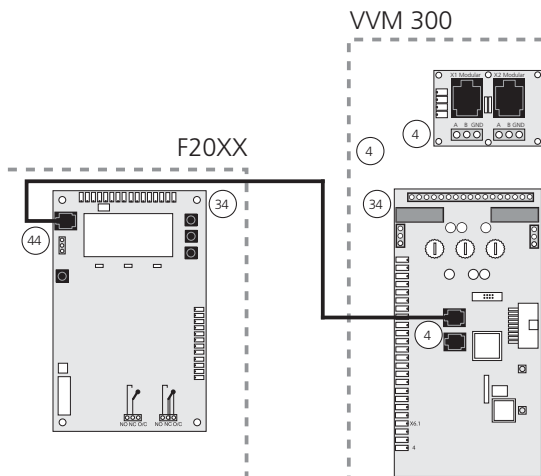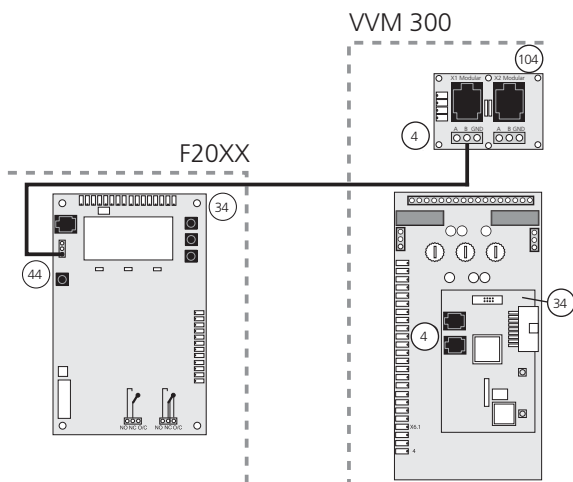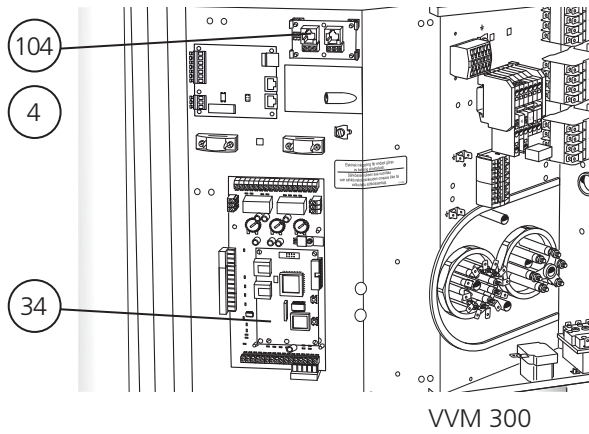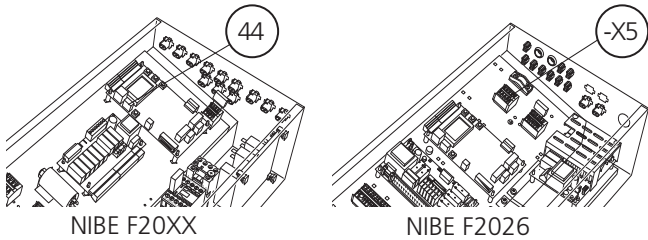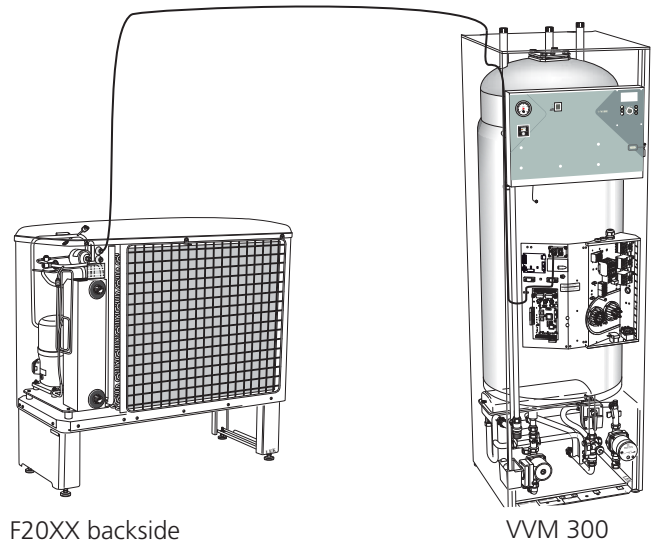
## Power rating as set at the factory

The immersion heater has a total maximum output of 6.0 kW. The power rating as set at the factory is 6.0 kW, which corresponds to position C on the knob (101) on the load monitor card (2).

## Resetting the temperature limiter

The temperature limiter (6) is accessible from behind the centre front cover and is positioned under the inner protective cover.

The temperature limiter is reset by firmly pressing in its button. The button can be accessed from the underside of the distribution box. The cover on the distribution box does not need to be removed when resetting.
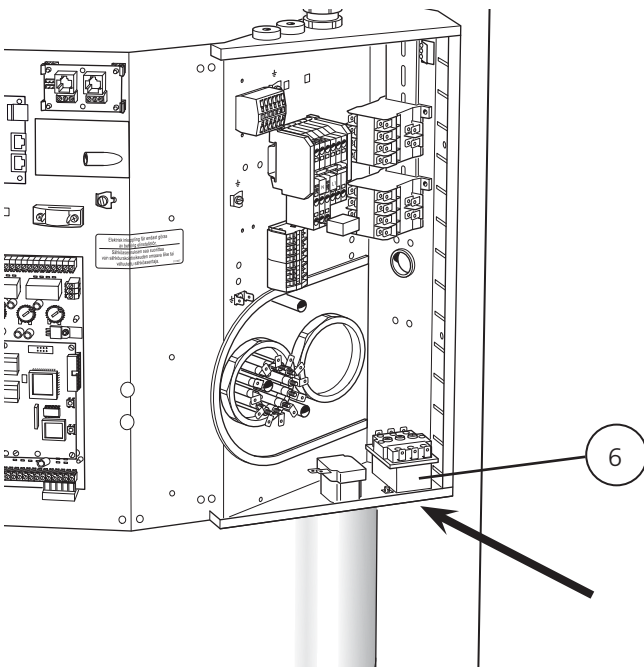


## NOTE!

*Work behind covers secured by screws may only be carried out under the supervision of a qualified installation engineer.*

## Max boiler temperature

| Boiler temperature | Knob position |
|---|---|
| 55 | A |
| 60 | B |
| 65 | C |
| 70 | D |
| 75 | E |
| 80 | F |

The setting of the different maximum boiler temperatures is done using the knob (102) on the load monitor card (2). Set value displayed in menu 9.3.1.

## Max phase current

| Immersion heater, output (kW) | Knob position | Max load phase (A) |
|---|---|---|
| 2.0 | A | 9.2 |
| 4.0 | B | 17.9 |
| 6.0 | C | 26.6 |

The setting of the different maximum immersion heater outputs is done using the knob (101) on the load monitor card (2). Set value displayed in menu 8.3.2.
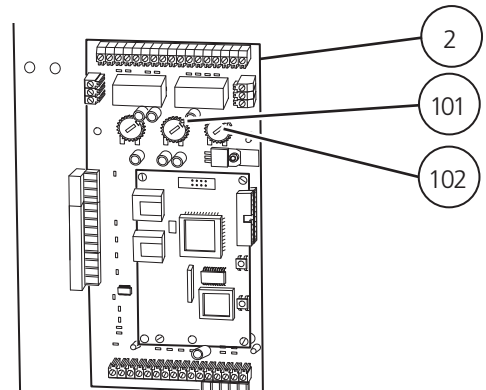


## Connecting the outside sensor

Install the outside sensor in the shade on a wall facing north or north-west, so it is unaffected by the morning sun. The sensor is connected with a two-wire cable to terminal block (14) positions 1 and 2, on the load monitor card (2).

If a conduit is used it must be sealed to prevent condensation in the sensor capsule.

The minimum cable cross section should be 0.4 mm$^2$ up to lengths of 50 metres, for example, EKKX or LiYY.

**NOTE!** To prevent interference, sensor cables and communication cables must be separated (min 20 cm) from high voltage cable when cable routing.
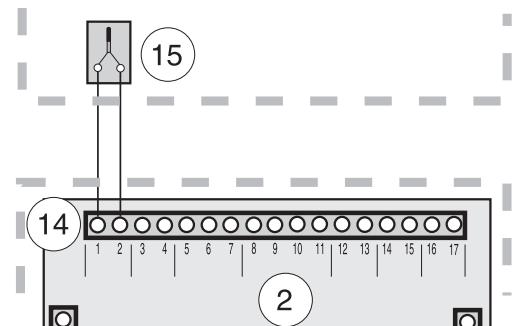
**Electrical connections**

## Centralised load control/Tariff

In those cases centralised load control or tariff control is used this can be connected to the terminal block (14) on the load monitor card (2), which is positioned behind the centre front cover.

Tariff A: To limit the electrical output to half of what is set with max electrical output knob (101), connect a potential free contact between 5 and 7 on the terminal block (14).

Tariff B: When the complete electrical output is to be disconnected, a potential free contact is connected between 6 and 7 on terminal block (14).

Tariff C: When the complete electrical output together with the heat pump is to be disconnected, a potential free contact is connected between 12 and 13 on terminal block (14).

A closed contact results in the electrical output being disconnected.
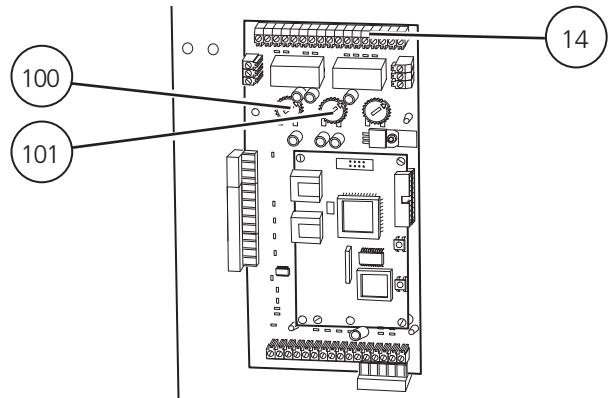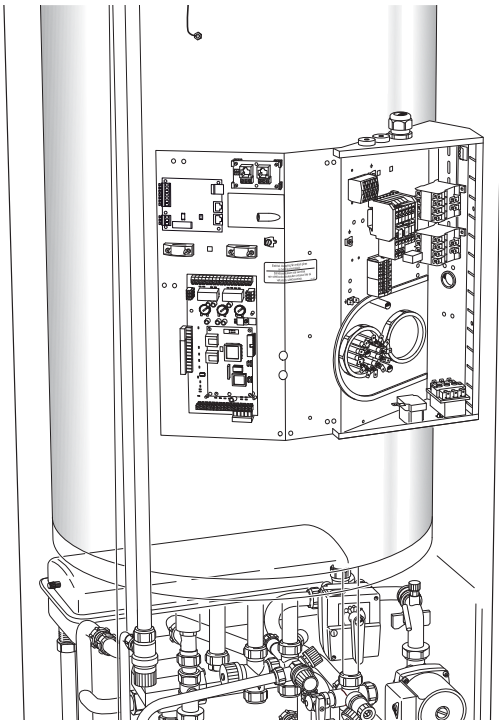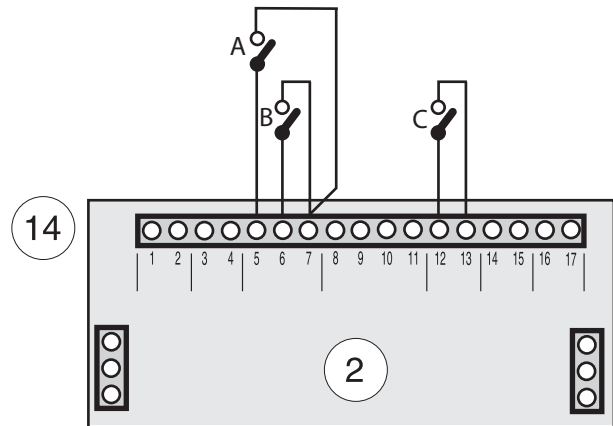
## External contacts

### Contact for changing the room temperature

An external contact function can be connected to SMO 10 to change the supply temperature and in doing so change the room temperature, for example, a room thermostat or a timer. The contact should be potential free and is connected to terminals 3 and 4 on terminal block (14) on the EBV card (2) and/or terminals 14 and 15 for heating system 2.

When contact is made, the supply temperature increases or decreases. The value for the change is set on menu 2.5, External adjustment (3.5 for heating system 2). The value is adjustable between -10 and +10. One step corresponds to one offset step of the heat curve.

### Contact for activation of "Extra hot water"

An external contact function can be connected to VVM 300 for activation of the "Temporary extra hot water" function.
The contact should be potential free and non-locking and is connected via the edge board connector between positions 1 and 2 down on the lower part of the left connection row on the load monitor card (2).

When the contact makes for at least one second, the "Temporary Extra hot water" function is activated. An automatic return to the previously set function occurs after 3 hours.

### Room sensor

A room sensor, type RG 05, can be connected to SMO 10 between pos 3 and 4 on terminal block X4 on the EBV card. SMO 10 compensates, by increasing or reducing the calculated supply temperature, to maintain the room temperature.

The room sensor is activated under menu 9.3.5. When activated, menu 6.0 can be accessed and required settings made in its sub-menus.
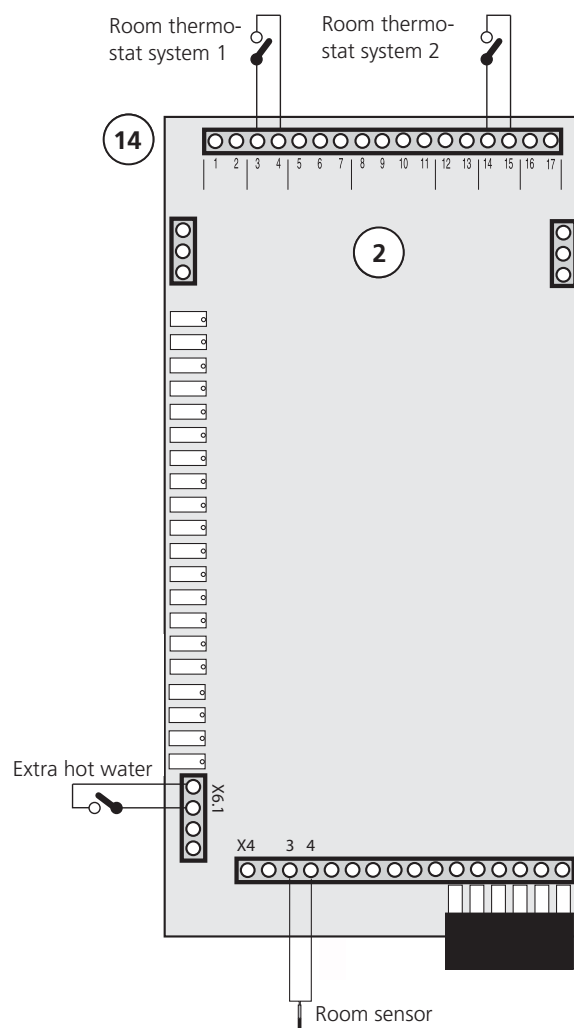
# Commissioning and adjusting

## Preparations

Check that the switch (8) is set to "0".

Check that valves (44) and (50) are fully open and that the temperature limiter (6) has not tripped (press the button firmly).

## Filling the hot water heater and the heating system

■ The heater is filled by first opening a hot water tap and then opening the filling valve (46) fully. This valve should then be fully open during operations. When water comes out of the hot water tap this can be closed.

■ Open the filling valve (49). The boiler part of the heat pump and the radiator system are now filled with water.

■ After a while the pressure gauge (42) will show rising pressure. When the pressure reaches 2.5 (bar) (approx. 25 mvp) a mixture of air and water starts to emerge from the safety valve (52). The filling valve is then closed (49).

■ Turn the safety valve (52) until the boiler pressure reaches the normal working range (0.5 - 1.5 bar).

## Venting the heating system

NOTE! The pipe from the tank/double jacket must be drained of water before air can be released. This means that the system is not necessarily bled despite the flow of water when the safety valve (52) is opened for the first time.

■ Bleed VVM 300 through the safety valve (52) and the rest of the heating system through the relevant venting valves.

■ Keep topping up and venting until all air has been removed and the pressure is correct.



Recovery of temperature limiter
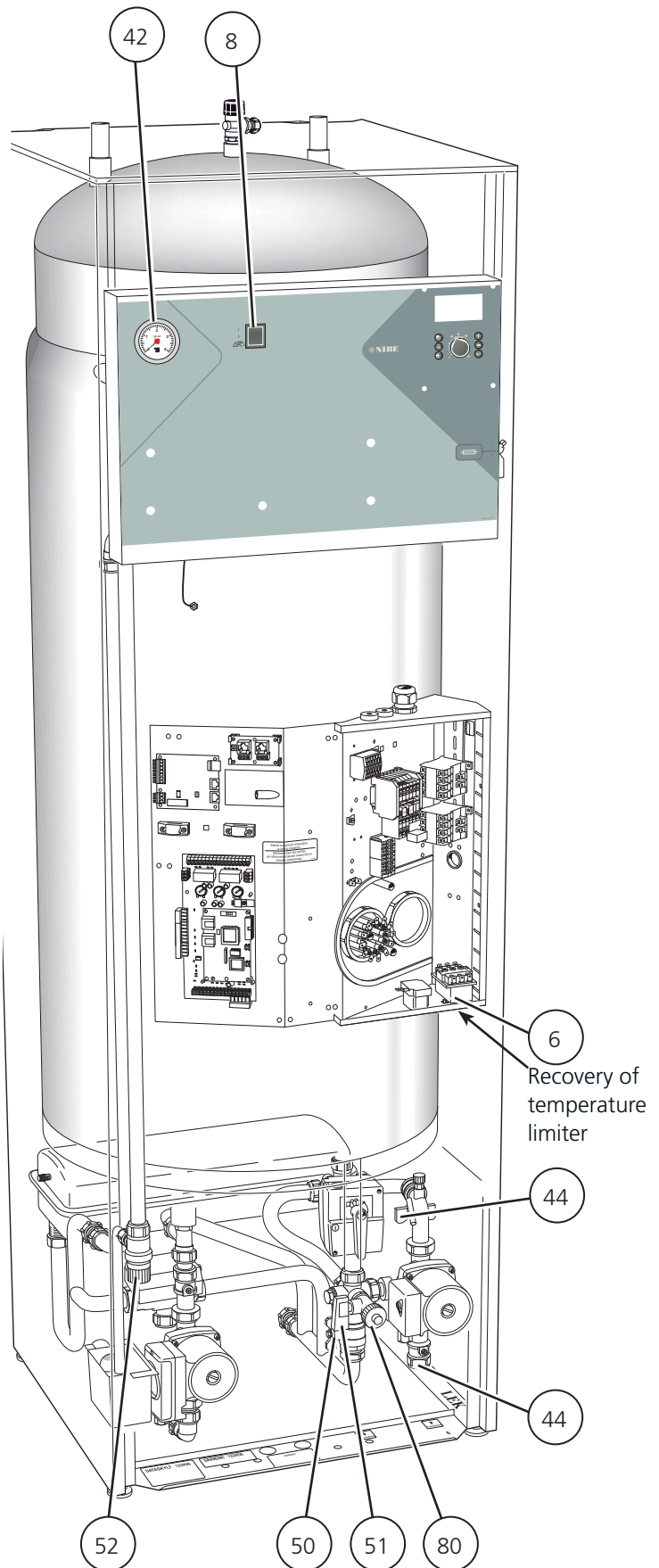
## Commissioning F20XX and VVM 300

### F20XX

1. Follow the instructions in F20XX Installation and Maintenance under section "Commissioning and adjustment" – "Start-up and inspection".

2. Check that the value is "1" in channel A1 in F20XX.

3. Check that the communication cable is connected.

### VVM 300

1. Turn the isolator switch for VVM 300 on and check that the miniature circuit breaker is on.

2. Check that the communication cable between F20XX and VVM 300 is connected.

3. Set the switch (8) to 1.

4. Set the date and time in menu 7.1 and 7.2

5. Select "Service" in menu 8.1.1

6. Set the fuse size on knob (100). Check the value in menu 8.3.1.

7. Set the max immersion heater output on knob (101). Check the value in menu 8.3.2.

8. Set the heating medium pump to position 1.

9. Select operating mode "Auto" using the operating mode button and set parallel offset changes to -10.

10. The heat pump starts in hot water production.

11. Select the desired heat curve in menu 2.1, and reset parallel offset.

## Commissioning VVM 300 without F20XX

1. Turn the isolator switch for VVM 300 on and check that the miniature circuit breaker is on.

2. Select "Service" in menu 8.1.1.

3. **Select "Off" in menu 9.3.13.**

4. Set the date and time in menu 7.1 and 7.2.

5. Select "Yes" in menu 9.3.2.

6. Select "0" in menu 9.1.2.

7. Set the fuse size on knob (100). Check the value in menu 8.3.1.

8. Set the max immersion heater output on knob (101). Check the value in menu 8.3.2.

9. Select the "Auto" operating mode using the operating mode button.

10. Select heat curve in menu 2.1.

## Readjustment

Air is initially released from the hot water and venting may be necessary. If bubbling sounds can be heard from the heat pump, the entire system requires further venting. NOTE! Safety valve (52) also acts as a manual venting valve. Operate it with care, since it opens quickly. When the system is stable (correct pressure and all air eliminated) the automatic heating control system can be set as required. See the section "Room temperature" –" Default settings" and "Front panel".

# Control
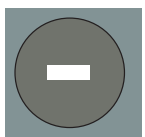
## General

The menu tree shows all the menus. Three different menu types can be chosen.

(N) Normal, covers the normal user's needs.

(U) Extended, shows all menus except the service menus.

(S) Service, shows all menus, returns to normal 30 minutes after the last button was pressed.

Changing of menu type is done from menu 8.1.1

Information is presented on the display about the status of the heat pump and the electric boiler. Menu 1.0 is normally shown on the display screen. The plus and minus buttons and the enter button are used to scroll through the menu system as well as to change the set value in some menus.

The Plus button is used to move forward to the next menu on the current menu level and to increase the value of the parameter in menus where this is possible.

The Minus button is used to move back to the previous menu on the current menu level and to decrease the value of the parameter in menus where this is possible.

The Enter button is used to select submenus of the current menu, to permit parameters to be changed and confirm any changes to parameters. When the menu number ends with a zero this indicates there is a submenu.
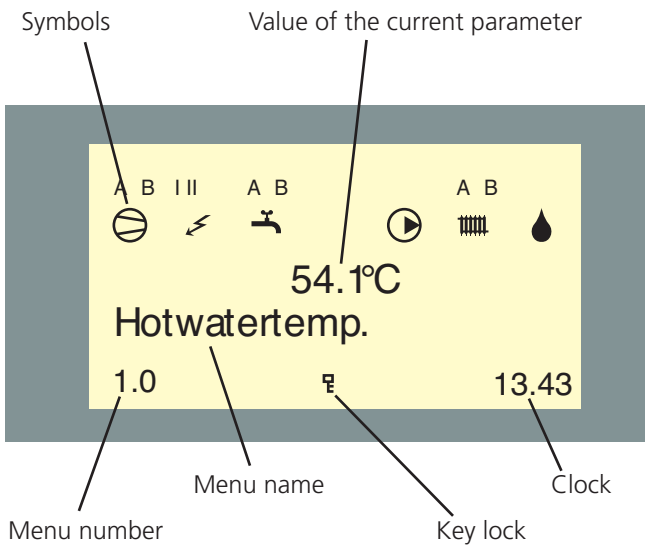
## Key lock

A key lock can be activated in the main menus by simultaneously pressing the Plus and the Minus buttons. The key symbol will then be shown on the display. The same procedure is used to deactivate the key lock.

## Quick movement

To quickly return to the main menu from sub-menus press the lower button on the left hand side.

Symbols            Value of the current parameter

A B I II    A B           A B

54.1°C
Hotwatertemp.

1.0                        13.43

Menu name              Clock

Menu number          Key lock

## Changing parameters

### Changing a parameter (value)

- Access the required menu.
- Press the enter button, the numerical value starts to flash
- Increase or decrease the value with the Plus/Minus buttons.
- Confirm by pressing the enter button.
- Menu 1.0 is automatically displayed again 30 minutes after the last button press.

## Example

### Changing the Menu type, menu 8.1.1.

- The starting point is menu 1.0.
- Press the plus or minus button several times until the menu displays 8.0.
- Press the enter button to access menu 8.1.0.
- Press the enter button to access menu 8.1.1.
- Press the enter button to allow the value to be changed.
- The value now flashes. Change the value by pressing the plus or minus buttons.
- Confirm the selected value by pressing the enter button and the value stops flashing.
- Press the minus button to move to menu 8.1.5.
- Press the enter button to return to menu 8.1.0.
- Press the plus button 3 times to access menu 8.4.
- Press the enter button to return to menu 8.0.
- Press the plus or minus button several times to access menu 1.0.

| 8.0 Other adjustments | |
|---|---|

| 8.1.0 Display settings | 8.1.1 Menu type |
|---|---|
| ... | 8.1.2 Language |
| | 8.1.3 Display contrast |
| ... | 8.1.4 Light intensity |
| ... | 8.1.5 Return |
| 8.5 Return | |

**Control**

```
IIIII  A B   III     III
⊖  ⚡  ⚒  ▷  ⊕          ♦
        50.0  C
   Hotwatertemperature
1.0          ⊞      ⊕ 13.43
```

**1.0**
**Hot water temp.** ↵

**2.0**
**Supply temp.** ↵

**3.0**
**Supply temp. 2*** ↵

(N)

1.1
Start temperature HW

1.2
Stop temperature HW

1.3
Stop temp. XHW

1.4
Interval XHW

1.5
Next XHW action

1.6
HW run time

1.7
Return ↵

(U)

2.1
Heat curve

2.2
Offset heating curve

2.3
Min supply temp.

2.4
Max supply temp.

2.5
External adjustment

3.1
Heat curve 2

3.2
Offset heat curve 2

3.3
Min. supply temp. 2

3.4
Max. supply temp. 2

3.5
External adjustment2

3.6.0
Own heat curve 2 ↵

3.6.1
Supply temp.at +20°C

3.7
Return temperature 2

3.6.2
Supply temp.at -20°C

3.8
Return ↵

3.6.3
Buckling temperature

3.6.4
Supply t. at buckl.

3.6.5
Return ↵

2.6.0
Own heat curve ↵

2.6.1
Supply temp.at +20°C

2.7
Return temperature

2.6.2
Supply temp.at-20°C

2.8
Degree minutes

2.6.3
Set temperature

2.9
Return ↵

2.6.4
Flow temp. at set

2.6.5
Return

(N) Normal, covers the normal user's needs.

(U) Extended, shows all menus except the ser-
vice menus.

(S) Service, shows all menus, returns to nor-
mal 30 minutes after the last button was
pressed.

* Accessory ESV 20 and activation i menu 9.3.3 required.

```
        IIIII  A B   III   III
      ⊖  ⚡  ⌁  ⊗  ⊕           ♦
          50.0  C
      Hotwatertemperature
      1.0          ⚑    ⊕ 13.43
```

**4.0**
**Outdoor temp.**  ↵

4.1
Outdoor avg. temp.

4.2
Return  ↵

**5.0**
**Heat pump**  ↵

5.2
Heat pump op. mode #

5.3
Heat pump status   #

5.4
Minutes to start   #

5.6
Starts count B     #

5.8
Acc. run time B    #

5.9
Outdoor temp.      #

5.10
Evapor. temp.      #

5.11
Suction gas temp   #

5.12
Liquid temperature #

5.13
Hotgas temperature #

5.14
Return temperature #

5.15
Diff. Supply/return

5.16
Start defrosting   #

5.17
Return  ↵

**6.0**
**Room temperature***  ↵

6.1
Room adjustment

6.2
Roomtemp. setpoint

6.3
Shunt system  ↵

6.3
Return  ↵

* Accessory RG 10 and activation i menu 9.3.5 required.

**Control**

```
┌─────────────────────────┐
│ ⅢⅢ  A B   Ⅲ    Ⅲ         │
│ ⊖  ⚒  ⚒  ▷  ▶      ◦    │
│      50.0  C            │
│   Hotwatertemperature    │
│ 1.0            ⏱ 13.43   │
└─────────────────────────┘
```

| | | |
|---|---|---|
| **7.0** **Clock** ⏎ | | |

| | |
|---|---|
| 7.1 Date | |
| 7.2 Time | |
| 7.3.0 Temp set back ⏎ | 7.3.1 Set back time |
| | 7.3.2 Set back temp +/- |
| | 7.3.3 Shunt system |
| | 7.3.4 Return ⏎ |
| 7.4.0 Extra hot water ⏎ | 7.4.1 XHW Monday |
| | 7.4.2 XHW Tuesday |
| | 7.4.3 XHW Wednesday |
| | 7.4.4 XHW Thursday |
| | 7.4.5 XHW Friday |
| | 7.4.6 XHW Saturday |
| | 7.4.7 XHW Sunday |
| | 7.4.8 Return ⏎ |
| 7.5.0 Vacation set back ⏎ | 7.5.1 Vacation begins |
| 7.6 Return ⏎ | 7.5.2 Vacation ends |
| | 7.5.3 Shunt system |
| | 7.5.4 Offset heating curve |
| | 7.5.5 HW deactivated |
| | 7.5.6 Pool deactivated |
| | 7.5.7 Return ⏎ |

| | | |
|---|---|---|
| **8.0** **Other adjustments** ⏎ | | |

| | | |
|---|---|---|
| 8.1.0 Display settings ⏎ | | 8.1.1 Menu type |
| | | 8.1.2 Language |
| | | 8.1.3 Display contrast |
| | | 8.1.4 Light intensity |
| 8.2.0 Auto mode settings ⏎ | 8.2.1 Summertemp. | 8.1.5 Return ⏎ |
| | 8.2.2 Wintertemp | |
| | 8.2.3 Return ⏎ | |
| 8.3.0 Current limiter* ⏎ | | 8.3.1 Fuse size* |
| 8.4.0 Pool settings ⏎ | 8.4.1 Pool control | 8.3.2 Max. electric power* |
| | 8.4.2 Pool temperature | 8.3.3 Current phase 1* |
| | 8.4.3 Pool start temp. | 8.3.4 Current phase 2* |
| | 8.4.4 Pool stop temp. | 8.3.5 Current phase 3* |
| | 8.4.5 Return ⏎ | 8.3.6 Tranform. ratio EBV* |
| 8.5.0 Period settings ⏎ | 8.5.1 Period time | 8.3.7 Return ⏎ |
| 8.6 Return ⏎ | 8.5.2 Max time for HW | |
| | 8.5.3 Return ⏎ | |

*Menus not used in this application.

```
┌─────────────────────┐
│ IIIII A B  III  I II │
│ ⊖ ⌁ ⌁ ⊚ ⊕      ♦   │
│      50.0  C         │
│  Hotwatertemperature │
│ 1.0          ⊕ 13.43 │
└─────────────────────┘
```

**9.0**
**Service menus**

9.1.0
Heat pump settings

9.2.0
Add. heat settings

9.3.0
Operating settings

9.4
Quick start

9.5.0
Alarmlog

9.6.0
System Info

9.7
Return

**S**

9.5.1.0 - 9.5.4.0
Logg 1 – 4

9.5.5.0
Return

9.5._.1
Time

9.5._.2
Alarm/Info

9.5._.3
Hot water temp.

9.5._.4
Supply temp.

9.5._.5
Return temp.

9.5._.6
Outdoor temp.

9.5._.7
Run time compressor

9.5._.8
Acc. run time

9.5._.9
Operating mode

9.5._10
Outdoor temp.

9.5._.11
Evapor. temp.

9.5._.12
Return temp.

9.5._.13
Diff supply/return

9.5._.14
Suction gas temp.

9.5._.15
Hotgas temp

9.5._.16
Liquid temp.

9.5._.17
Relay status 1-8

9.5._.18
Relay status 9-14

9.5._.19
Return

9.3.1
Max. boiler temp.

9.3.2
Add. heat mode

9.3.3
Shunt 2

9.3.4
Room unit

9.3.5
Room sensor

9.3.6
Reset alarm

9.3.7
Clear alarm log

9.3.8.0
Test mode

9.3.9
Factory setting

9.3.10
Operating mode

9.3.11.0
Floor drying setting

9.3.12
Supply pump exer.

9.3.13
Freeze protection

9.3.14
Supply pump settings

9.3.15
Return

9.2.1
Start add. heat.

9.2.2
Time factor

9.2.6
Shunt amplification

9.2.7
Shunt amplification2

9.2.8
Return

9.3.14.1
Min speed

9.3.14.2
Max speed

9.3.14.3
Default speed

9.3.14.4
Desired speed

9.3.14.5
Return

9.1.1
Heat p. start value

9.1.2
Number of heat pumps

9.1.3
Start defrost(06)

9.1.4
Stop defrost(07)

9.1.5
Max defrost time(09)

9.1.6
Time betw. defr(10)

9.1.9
Stop Temp.(18)

9.1.10
Time bet. starts(19)

9.1.14
Heat pump stop XHW

9.1.15
Max heat p. time XHW

9.1.16
Return

9.3.11.1
Floor drying

9.3.11.2
Period time 1

9.3.11.3
Temperat. period 1

9.3.11.4
Period time 2

9.3.11.5
Temperat. period 2

9.3.11.6
Return

# Menu explanation

## Main menus

| N | **35.1°C**<br>Hot water temp.<br>1.0 |
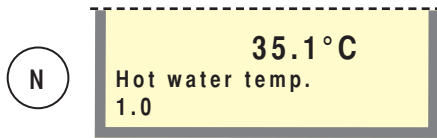
### Menu 1.0  Hot water temp.

The current hot water temperature (HWS) in the outer jacket is shown here. Note that the hot water temperature at the top of the tank is usually higher.

| N | **31.7(28.0)°C**<br>Supply temp.<br>2.0 |
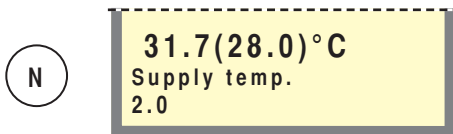
### Menu 2.0  Supply temp.

The current supply temperature (FG1) for the heating system is shown here with the calculated supply temperature in brackets.

| N | **25.7(24.0)°C**<br>Supply temp. 2<br>3.0 |
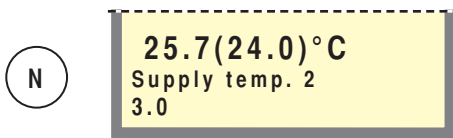
### Menu 3.0  Supply temp. 2*

The current supply temperature (FG2) for the heating system is shown here with the calculated supply temperature in brackets.

This menu is shown first when "On" is selected in menu 9.3.3.

| N | **10.3°C**<br>Outdoor temp.<br>4.0 |

### Menu 4.0  Outdoor temp.

The current outdoor temperature is shown here. Measured from outdoor sensor (UG).

| N | Normal, covers the normal user's needs. |

| U | Extended, shows all menus except the service menus. |

| S | Service, shows all menus, returns to normal 30 minutes after the last button was pressed. |

| N | Heat pump<br>5.0 |
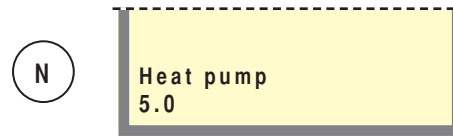
### Menu 5.0  Heat pump

Readings regarding the heat pump are set on the submenus to this menu.

| N | **21.2 (21.0)°C**<br>Room temperature<br>6.0 |
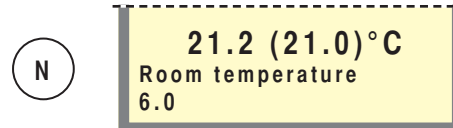
### Menu 6.0  Room temperature*

Current room temperature is displayed here. Desired room temperature is displayed here within brackets.

Settings regarding room temperature control can be made in the sub-menus to this menu.

| N | Clock<br>7.0 |
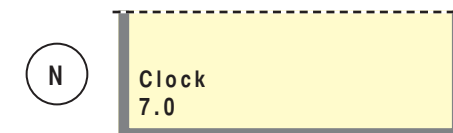
### Menu 7.0 Clock

Settings regarding the date and time are made in the sub-menus of this menu. Different temperature reductions and increases at selected times are also set from this menu.

| N | Other adjustments<br>8.0 |
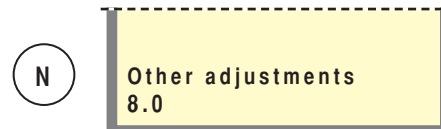
### Menu 8.0  Other adjustments

Settings regarding the menu type, language, operating mode settings and load monitor reading are made in the sub-menus to this menu.
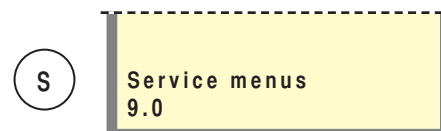
| S | Service menus<br>9.0 |

### Menu 9.0  Service menus

This menu and its sub-menus are only shown on the display screen when access has been selected in menu 8.1.1.

Values can be read and various settings can be made from these sub-menus. NOTE! These settings should only be made by persons with the necessary expertise.

* Accessories are needed.

## 1.0 Hot water temp.

### Menu 1.1  Start temperature HW

The temperature when the heat pump starts to work with the hot water heater is set here.

The value can be set between 25 and 50 °C. The factory setting is 45 °C.

### Menu 1.2  Stop temperature HW

The temperature when the heat pump/immersion heater should stop heating the water is set here.

The value can be set between 30 and the set value in meny 1.3. The factory setting is 50 °C. Too high stop temperature can result in HP alarm.

### Menu 1.3  Stop temp. XHW

The desired stop temperature for extra hot water is set here.

The value can be set between 40 and 80 °C. The factory setting is 65 °C.

### Menu 1.4 Interval XHW

How often the hot water temperature is increased from the normal level to the "Extra hot water" level is shown here.

The value is adjustable between 0 and 90 days. Periodic extra hot water is **shut-off** at value **0**. Extra hot water is started when the value is confirmed. The factory setting is 14 days.

### Menu 1.5 Next XHW action

Future increases to the "Extra hot water" level are shown here.

### Menu 1.6 HW run time

How long hot water heating has been in progress is shown here (accumulated).

### Menu 1.7 Return

Return to Menu 1.0.

## 2.0 Supply temp.

### Menu 2.1  Heat curve

The selected curve slope (heat curve) is selected here. At value 0, the function "Own curve" is activated, see menu 2.6.0.

The value can be set between curves 0 and 20. The factory setting is 9.

### Menu 2.2 Heating curve offset

The selected heating curve offset is shown here. The value is adjustable between -10 and +10. NOTE! The value is changed using the "Heating curve offset" knob.

### Menu 2.3 Min supply temp.

The desired minimum level for the supply temperature for the heating system is selected here.

The calculated flow temperature never drops below the set level irrespective of the outdoor temperature, curve slope or offset heating curve.

The value can be set between 10 and 65 °C. The factory setting is 15 °C.

### Menu 2.4 Max supply temp.

The desired maximum level for the supply temperature for the heating system is selected here.

The calculated flow temperature never exceeds the set level irrespective of the outdoor temperature, curve slope or offset heating curve.

The value can be set between 10 and 80 °C. The factory setting is 55 °C.

### Menu 2.5 External adjustment

Connecting an external contact, see "Electrical connections - External contacts", for example, a room thermostat or a timer allows you to temporarily or periodically raise or lower the supply temperature and with that the room temperature. When the external contact is made, the heating curve offset is changed by the number of steps shown here.

The value can be set between -10 and +10. The factory setting is 0.

### Menu 2.6.0  Own heat curve

Here you can select your own heat curve definition. This is an individual linear curve with one break point. You select a break point and the associated temperatures.
**NOTE!** The "Curve slope" in menu 2.1 must be set to 0 to activate this function.

### Menu 2.6.1  Supply temp.at +20ºC

The supply temperature at an outside temperature of +20 is selected here.

The value can be set between 0 and 80 °C. The factory setting is 15 °C.

### Menu 2.6.2  Supply temp.at -20ºC

The supply temperature at an outside temperature of -20 is selected here.

The value can be set between 0 and 80 °C. The factory setting is 35 °C.

### Menu 2.6.3  Buckling temperature

Here you select at what outside temperature the break point shall occur.

The value can be set between -15 and +15 °C. The factory setting is 0 °C.

### Menu 2.6.4  Supply t. at buckl.

You set the required flow temperature for the break point here.

The value can be set between curve 0 and 80 °C. The factory setting is 20 °C.

### Menu 2.6.5 Return

Return to Menu 2.6.

### Menu 2.7 Return temperature

The current actual return line temperature from the heating system is shown here.

### Menu 2.8 Degree-minutes

Current value for number of degree-minutes. For example, this value can be changed to accelerate the start of heating production.

The value can be changed from -700 and downwards.

### Menu 2.9 Return

Return to Menu 2.0.

## 3.0 Supply temp. 2*

**Menu 3.1 Heat curve 2**

The desired curve slope (heat curve) 2 is selected here. At value 0 the function "Own curve" is activated, see menu 3.6.0.

The value can be set between curves 0 and 20. The factory setting is 6.

**Menu 3.2 Offset heat curve 2**

Offset for heat curve 2 is selected here.

The value can be set between -10 and +10. The factory setting is -1.

**Menu 3.3 Min. supply temp. 2**

The desired minimum level for the flow line temperature for heating system 2 is selected here.

The calculated flow temperature never drops below the set level irrespective of the outdoor temperature, curve slope or offset heating curve.

The value can be set between 10 and 65 °C. The factory setting is 15 °C.

**Menu 3.4 Max supply temp. 2**

The desired maximum level for the supply temperature for heating system 2 is selected here.

The calculated flow temperature never exceeds the set level irrespective of the outdoor temperature, curve slope or offset heating curve.

The value can be set between 10 and 80 °C. The factory setting is 45 °C.

**Menu 3.5 External adjustment2**

Connecting an external contact, see "Electrical connections - External contacts", for example, a room thermostat or a timer allows you to temporarily or periodically raise or lower the supply temperature and with that the room temperature. When the external contact is made, the heating curve offset is changed by the number of steps shown here.

The value can be set between -10 and +10. The factory setting is 0.

**Menu 3.6.0  Own heat curve 2**

Here you can select your own heat curve definition. This is an individual linear curve with one break point. You select a break point and the associated temperatures.
NOTE! The "Curve slope" in menu 3.1 must be set to 0 to activate this function.

**Menu 3.6.1  Supply temp.at +20ºC**

The supply temperature at an outside temperature of +20 is selected here.

The value can be set between 0 and 80 °C. The factory setting is 15 °C.

**Menu 3.6.2  Supply temp.at -20ºC**

The supply temperature at an outside temperature of -20 is selected here.

The value can be set between 0 and 80 °C. The factory setting is 35 °C.

**Menu 3.6.3  Buckling temperature**

Here you select at what outside temperature the break point shall occur.

The value can be set between -15 and +15 °C. The factory setting is 0 °C.

**Menu 3.6.4  Supply t. at buckl.**

You set the required flow temperature for the break point here.

The value can be set between curve 0 and 80 °C. The factory setting is 20 °C.

**Menu 3.6.5 Return**

Return to Menu 3.6.

**Menu 3.7 Return temperature 2**

The current actual return line temperature from the heating system 2 is shown here.

**Menu 3.8 Return**

Return to Menu 3.0.

* Requires accessory and activation in menu 9.3.3.

## 4.0 Outdoor temp.

### Menu 4.1 Outdoor avg. temp.

The average outdoor temperature over the last 24 hours.

### Menu 4.2 Return

Return to Menu 4.0.

## 5.0 Heat pump

### Menu 5.2  Heat pump op. mode    #

The operating status of the heat pump is shown here, alternatively which alarm has been activated (corresponds to channel 00 in the heat pump). In the event of an alarm the heat pump can be restarted using the enter button.

### Menu 5.3  Heat pump status #

Displays compressor status for the heat pump (corresponds to channel 27 in the heat pump).

"Waiting" means that the compressor starts as soon as the time conditions in the heat pump permits.

"Stopped" means the compressor is at a stand still.

"Compr. on" means that the compressor is running.

### Menu 5.4 Minutes to start  #

Time until compressor start in F20XX is shown in this menu.

### Menu 5.6 Starts count B      #

The accumulated number of starts with the compressor in F20XX is shown here.

### Menu 5.8 Acc. run time B  #

The accumulated time that the compressor has been in operation in F20XX is shown here.

## 6.0 Room temperature*

**Menu 5.9  Outdoor temp.     #**

This menu shows the outdoor air temperature that the heat pump measures.

**Menu 6.1  Room adjustment**

The factor that determines how much a deviation between desired and actual room temperature is to affect the supply temperature. If the deviation is 1 °C and the factor is 3, the supply temperature changes by  3 °C.

The factor can be adjusted between 0 and 10 in increments of 0.1. Factory setting is 1.0.

**Menu 5.10 Evapor. temp.     #**

This menu shows the evaporator temperature in the heat pump.

**Menu 5.11 Suction gas temp  #**

This menu shows the suction gas temperature in the heat pump.

**Meny 6.2  Shunt system**

Here you select which heating system the room adjustment should affect. Can be set at "System 1", "System 2", or "System 1+2".

**Menu 5.12 Liquid temperature  #**

This menu shows the liquid temperature in the heat pump.

**Menu 6.3  Roomtemp. setpoint**

The desired room temperature is set here.

The value can be adjusted between 10.0 and 30.0 °C in increments of 0.5 °C. Factory setting is 22.0 °C.

**Menu 5.13  Hotgas temperature  #**

This menu shows the hotgas temperature in the heat pump.

**Menu 6.4 Return**

Return to Menu 6.0.

**Menu 5.14 Return temperature #**

This menu shows the return temperature that the heat pump measures.

**Menu 5.15 Diff. Supply/return**

Difference (T) between the flow line and return line to/from the heat pump.

**Menu 5.16  Start defrosting  #**

Manual activation of defrosting procedure in the heat pump.

**Menu 5.17 Return**

Return to Menu 5.0.

* Requires accessory and activation in menu 9.3.5.

**Menu explanation**

## 7.0 Clock

**Menu 7.1 Date**

The current date is set here.

**Menu 7.2 Time**

Here the current time is set.

**Menu 7.3.0 Temp set back**

Settings, e.g. for night reduction can be selected in the sub-menus to this menu.

**Menu 7.3.1 Set back time**

The time for the day change, e.g. night reduction is chosen here.

**Menu 7.3.2 Set back temp +/-**

Changes to the flow temperature with a day change, e.g. night reduction are set here. The value can be adjusted between -10 and +10 steps for offset of the heat curve.

**Menu 7.3.3 Shunt system**

Here you select which heating system the room adjustment should affect. Can be set at "System 1", "System 2", or "System 1+2".

**Menu 7.3.4 Return**

Return to menu 7.3.0.

**Menu 7.4.0 Extra hot water**

Settings for control of extra hot water can be made in the sub-menus to this menu.

**Menu 7.4.1 – 7.4.7 XHW Monday – Sunday**

Here you select the period for respective days when extra hot water should be activated. Hours and minutes for both start and stop are shown. Equal values mean that extra hot water is not activated.

**Menu 7.4.8 Return**

Return to menu 7.4.0.

**Menu 7.5.0 Vacation set back**

Settings concerning vacation set back are made on the sub-menus to this menu.

When the vacation function is active, the flow temperature is lowered according to the chosen setting, and the hot water heating as well as pool heating can be turned off.

When the vacation function is deactivated, the heat pump

is heating the water for one hour, before extra hot water is activated.

**Menu 7.5.1 Vacation begins**

Here you select the start date for the vacation set back. The date is changed by pressing the enter-button. The vacation set back starts at 12:00 midnight the chosen date.

The same date in menu 7.5.1 and 7.5.2 deactivates the vacation set back.

**Menu 7.5.2 Vacation ends**

Here you select the end date for the vacation set back. The date is changed by pressing the enter-button. The vacation set back ends at 11:59 p.m. the chosen date.

The same date in menu 7.5.1 and 7.5.2 deactivates the vacation set back.

**Menu 7.5.3 Shunt system**

Here you select which heating system shall be affected by the vacation set back.

**Menu 7.5.4 Offset heating curve**

Here you select the heating curve offset during the vacation set back. The value can be adjusted between -10 and +10. The factory setting is -5.

If the selected heating system has a room sensor, the set back is given in degrees instead.

**Menu 7.5.5 HW deactivated**

Here you can select wether hot water heating shall be turned off during the vacation set back. Can be set to "Yes" or "No". The factory setting is "Yes".

**Menu 7.5.6 Pool deactivated**

Here you can select wether pool heating shall be turned off during the vacation set back. Can be set to "Yes" or "No". The factory setting is "Yes".

**Menu 7.5.7 Return**

Return to menu 7.5.0.

**Menu 7.6 Return**

Return to menu 7.0.

## 8.0 Other adjustments

### Menu 8.1.0 Display settings

Settings concerning language and menu type are set on the sub-menus to this menu.

### Menu 8.1.1 Menu type

The menu type is chosen here: Normal, extended or service.

(N) **Normal**, covers the normal user's needs.

(U) **Extended**, shows all menus except the service menus.

(S) **Service**, shows all menus, returns to normal 30 minutes after the last button was pressed.

### Menu 8.1.2 Language

The desired language is chosen here.

### Menu 8.1.3 Display contrast

The display's contrast is set here. The value can be set between 0 and 31. The factory setting is 20.

### Menu 8.1.4 Light intensity

The light intensity in idle mode is set here. Idle mode starts 30 minutes after the last button was pushed. The value is adjustable between 0 and 2.

0=shut-off, 1=low, 2=average.

The factory setting is 2.

### Menu 8.1.5 Return

Return to menu 8.1.0.

### Menu 8.2.0 Auto mode settings

Settings regarding auto mode can be made in the sub-menus to this menu.

### Menu 8.2.1 Summertemp.

The average temperature when the circulation pump and immersion heater are blocked is shown here.

The value can be set between 0 and 30 °C. The factory setting is 25 °C.

### Menu 8.2.2 Wintertemp

The average temperature when the circulation pump and immersion heater are activated is shown here.

The value can be set between 0 and 30 °C. The factory setting is 20 °C.

### Menu 8.2.3 Return

Return to menu 8.2.0.

### Menu 8.3.0 Current limiter*

Settings and readings regarding the load monitor are set on the sub-menus to this menu.

### Menu 8.3.1 Fuse size*

The setting selected on the load monitor card (2) is shown here knob (100).

### Menu 8.3.2 Max. electric power*

The setting selected on the load monitor card (2) is shown here knob (101).

### Menu 8.3.3 – 8.3.5 Current phase 1 – 3*

Shows the measured current from phase 1 – 3.

### Menu 8.3.6 Tranform. ratio EBV*

The transfer value must be defined depending on the current transformers used for the EBV card. This is done in this menu. The value is adjustable between 100 and 1250 in increments of 10. The setting 300 applies for the supplied current transformers.

### Menu 8.3.7 Return

Return to menu 8.3.0.

### Menu 8.4.0 Pool settings

Pool settings are made on the sub-menus to this menu.

### Menu 8.4.1 Pool control

You choose here whether pool control should be On or Off.

*Menus not used in this application.

**Menu explanation**

**Menu 8.4.2 Pool temperature**

Current pool temperature is displayed here.

**Menu 8.4.3 Pool start temp.**

The temperature at which pool heating is to start is shown here. When the temperature drops below this value, heating starts after the hot water and heating demands are met.

The value can be adjusted between 5 and 40 °C in increments of 0.5 °C.

The factory setting is 25 °C.

**Menu 8.4.4 Pool stop temp.**

The temperature at which pool heating is to stop.

The value can be adjusted between 5 and 40 °C in increments of 0.5 °C.

The factory setting is 28 °C.

**Menu 8.4.5  Return**

Return to menu 8.4.0.

**Menu 8.5.0 Period settings**

Time periods for heating and hot water production are set in the sub-menus for this menu.

**Menu 8.5.1 Period time**

The length of time for production of hot water and heating is set here.

The value is adjustable between 5 and 60 minutes. The factory setting is 60 minutes.

**Menu 8.5.2 Max time for HW**

Here you select how much time of the period time (menu 8.5.1) is to be used to heat the hot water when there is a need of both heating and hot water. If a pool is connected, the pool heating will use this time when there is no hot water demand.

The value is adjustable between 0 and 60 minutes. The factory setting is 30 minutes.

**Menu 8.5.3  Return**

Return to Menu 8.5.0.

**Menu 8.6 Return**

Return to Menu 8.0.

**9.0 Service menus**

**Menu 9.1.0 Heat pump settings**

Settings for the air/water heat pump are made from the sub-menus in this menu.

**Menu 9.1.1 Heat p. start value**

Degree minute setting for start of heat pump.

The value can be set between -120 and 0. The factory setting is -60.

**Menu 9.1.2 Number of heat pumps**

The number of connected heat pumps are indicated here.

The value can be set between 0 and 1.

The factory setting is 1.

**Menu 9.1.3 Start defrost(06)**

The desired start temperature on the evaporator sensor for heat pump defrosting is set here.

**Menu 9.1.4 Stop defrost(07)**

The desired stop temperature on the evaporator sensor for heat pump defrosting is set here.

**Menu 9.1.5 Max defrost time(09)***

The longest period for defrosting the heat pump is set here.

**Menu 9.1.6 Time betw. defr(10)***

Minimum running time, heat production before new defrosting is permitted in the heat pump.

* See Installation and Maintenance Instructions for F20XX for setting range and factory settings.

**Menu 9.1.9 Stop Temp.(18)\***

Stop temperature, set outdoor air temperature when the downtime relay in the heat pump is activated, and it stops.

**Menu 9.1.10 Time bet. starts(19)\***

Minimum time interval in minutes between compressor starts in the heat pump.

**Menu 9.1.14 Heat pump stop XHW**

The temperature at which extra hot water switches from compressor operation to immersion heater for hot water is set here. The same value as in menu 1.2 should be selected.

The value can be set between 45 and 65 °C. The factory setting is 50 °C.

**Menu 9.1.15 Max heat p. time XHW**

If the compressor does not manage to obtain the temperature after this time, SMO 10 switches to combined mode and the immersion heater starts in the hot water heater.

The value is adjustable between 0 and 20 minutes. The factory setting is 10 minutes.

**Menu 9.1.16  Return**

Return to menu 9.1.0.

**Menu 9.2.0 Add. heat settings**

Settings regarding additional heat and shunt in VVM 300 and any extra shunt can be made on the sub-menus in this menu.

**Menu 9.2.1 Start add. heat.**

The degree minute deficit that must be set before the additional heat supply is activated is set here.

A value between -1000 and -30 can be set . The factory setting is -400.

**Menu 9.2.2 Time factor**

The time factor of the immersion heater since first start up is shown here.  The value is saved and is not reset even when the boiler is switched off using the main power switch.

**Menu 9.2.6 Shunt amplification**

Applies to shunt 1 (43). E.g. 2 degrees difference and 2 in amplification gives 4 sec/min controlling the shunt.

The value can be set between 1 and 10. The factory setting is 4.

**Menu 9.2.7 Shunt amplification2**

Applies to any shunt 2 (SV2) (accessory required). E.g. 2 degrees difference and 2 in amplification gives 4 sec/min controlling the shunt. This function compensates for the speed variation found on different shunt motors that may be installed.

The value can be set between 1 and 10. The factory setting is 4.

**Menu 9.2.8 Return**

Return to menu 9.2.0.

**Menu 9.3.0 Operating settings**

Settings regarding additional heat, floor drying and a return to the factory settings can be made on the sub-menus in this menu.

**Menu 9.3.1 Max. boiler temp.**

The setting selected on the EBV card (2) knob (102) is shown here.

**Menu 9.3.2 Add. heat mode**

Additional heat mode is activated when "Yes" is shown on the display screen, otherwise "No" is shown. When the additional heat mode is activated, the immersion heater respective circulation pump cannot be blocked with the operating mode button.

**Menu 9.3.3 Shunt 2**

Shunt group 2 can be set to "On" or "Off" here (accessories required).

**Menu 9.3.4 Room unit**

Accessories are needed.

**Menu 9.3.5 Room sensor**

A room sensor is reset here if installed (accessory RG05 required).

**Menu 9.3.6 Reset alarm**

Resetting alarms in VVM 300.

**Menu 9.3.7 Clear alarm log**

Clearing the alarm log in VVM 300.

**Menu 9.3.8.0 Test mode**

Only for service personnel.

**Menu 9.3.9 Factory setting**

Return to the factory settings in VVM 300, "Yes" or "No".

**Menu 9.3.10 Operating mode**

Describes the operating status of VVM 300 and the air/water heat pump.

**Shutdown:** Additional heater and heat pump are shutdown due to an alarm.

**Alternating:** The heat pump produces heat and switches, when necessary, between hot water and heating.

**Combined Mode:** Due to a great heating demand, the immersion heater is used for hot water and the heat pump produces heat. The addition assists, when necessary, with heat production.

**Hot water:** Only hot water is produced. This is carried out by the heat pump.

**Menu 9.3.11.0 Floor drying setting**

Settings for the floor drying program are made in the sub-menus to this menu.

**Menu 9.3.11.1 Floor drying**

"On" or "Off" is selected for the floor drying program from this sub-menu. After time period 1 a switch is made to time period 2 followed by a return to the normal settings.

**Menu 9.3.11.2 Period time 1**

Selection of the number of days in period 1. The value is adjustable between 1 and 5 days. The factory setting is 3 days.

**Menu 9.3.11.3 Temperat. period 1**

Selection of the flow temperature in period 1. The value is adjustable between 15 and 50 °C. Factory setting is 25 °C.

**Menu 9.3.11.4 Period time 2**

Selection of the number of days in period 2. The value is adjustable between 1 to 5. The factory setting is 1 days.

**Menu 9.3.11.5 Temperat. period 2**

Selection of the flow temperature in period 2. The value is adjustable between 15 and 50 °C. Factory setting is 40 °C.

**Menu 9.3.11.6 Return**

Return to Menu 9.3.11.0.

**Menu 9.3.12 Supply pump exer.**

Supply pump exercise is set here. The value can be set between 3 and 60 seconds.

The factory setting is 10 seconds.

**Menu 9.3.13 Freeze protection**

Freeze protection can be deactivated here. In "Off" mode, freeze protection is not available.

The factory setting is "On".

**Menu 9.3.14.0 Supply pump settings**

Settings regarding the charge pump's speed controls can be made in the sub-menus to this menu.

**Menu 9.3.14.1 Min speed %**

The charge pump's minimum permitted speed is set here.

The value is adjustable between 15 and 100 % The value cannot be set higher than the setting in menu 9.3.14.3. The factory setting is 15 %.

**Menu 9.3.14.2 Max speed %**

The charge pump's maximum permitted speed is set here.

The value is adjustable between 15 and 100 % The value cannot be set lower than the setting in menu 9.3.14.3. The factory setting is 100 %.

**Menu 9.3.14.3 Default speed**

The start speed of the charge pump is set here.

The value can be adjusted between the minimum and maximum permitted speed (menus 9.3.14.1 and 9.3.14.2). The factory setting is 75 %.

**Menu 9.3.14.4 Desired Value**

The desired difference ($\Delta T$) between flow and return line is set here. Actual difference can be seen in menu 5.15.

The value can be set between 5 and 12 °C. The factory setting is 8 °C.

**Menu 9.3.14.5 Return**

Return to menu 9.3.14.0.

**Menu 9.3.15 Return**

Return to menu 9.3.0.

**Menu explanation**

**Menu 9.4 Quick start**

If "Yes" is selected, the compressor starts in the heat pump within 3 minutes if there is a hot water heating demand.

**Menu 9.5.0 Alarmlog**

The alarm logs with the last 4 alarms are shown in the sub-menus of this menu.

**Menu 9.5.1.0 – 9.5.4.0 Log 1 – 4**

Shows the last 4 alarms.

**Menu 9.5.5.0 Return**

Return to menu 9.5.0

**Menu 9.5.x.1 Time**

Shows the time of the actual alarm.

**Menu 9.5.x.2 Alarm/Info**

Shows information about the current alarm.

**Menu 9.5.x.3 Hot water temperature**

Shows the hot water temperature at the time of the current alarm.

**Menu 9.5.x.4 Supply temperature**

Shows the heating system's flow temperature at the time of the current alarm.

**Menu 9.5.x.5 Return temperature**

Shows the heating system's return temperature at the time of the current alarm.

**Menu 9.5.x.6 Outdoor temperature**

Shows the outdoor temperature (outdoor temperature sensor connected to the VVM) at the time of the current alarm.

Menu 9.5.x.7 Run time compressor

Displays total compressor run time.

**Menu 9.5.x.8 Acc. run time**

Shows the run time on the compressor at the time of the current alarm.

**Menu 9.5.x.9 Operating mode**

Shows the **operating mode** of VVM 300 and the heat pump at the time of the current alarm.

**Menu 9.5.x.10 Outdoor temperature**

Shows the outdoor air temperature at the time of the current alarm.

**Menu 9.5.x.11 Evaporator temperature**

Shows the evaporator temperature at the time of the current alarm.

**Menu 9.5.x.12 Return temperature**

Shows the outdoor unit's return temperature at the time of the current alarm.

**Menu 9.5.x.13 Diff supply/return**

Shows the difference between the flow line and return at the time of the current alarm.

**Menu 9.5.x.14 Suction gas temperature**

Shows the suction gas temperature at the time of the current alarm.

**Menu 9.5.x.15 Hotgas temperature**

Shows the hotgas temperature at the time of the current alarm.

**Menu 9.5.x.16 Liquid temperature**

Shows the liquid line temperature at the time of the current alarm.

**Menu 9.5.x.17 Relay status 1-8**

Shows the relay status on relays 1-8 at the time of the current alarm.

**Menu 9.5.x.18 Relay status 9-14**

Shows the relay status on relays 9-14 at the time of the current alarm.
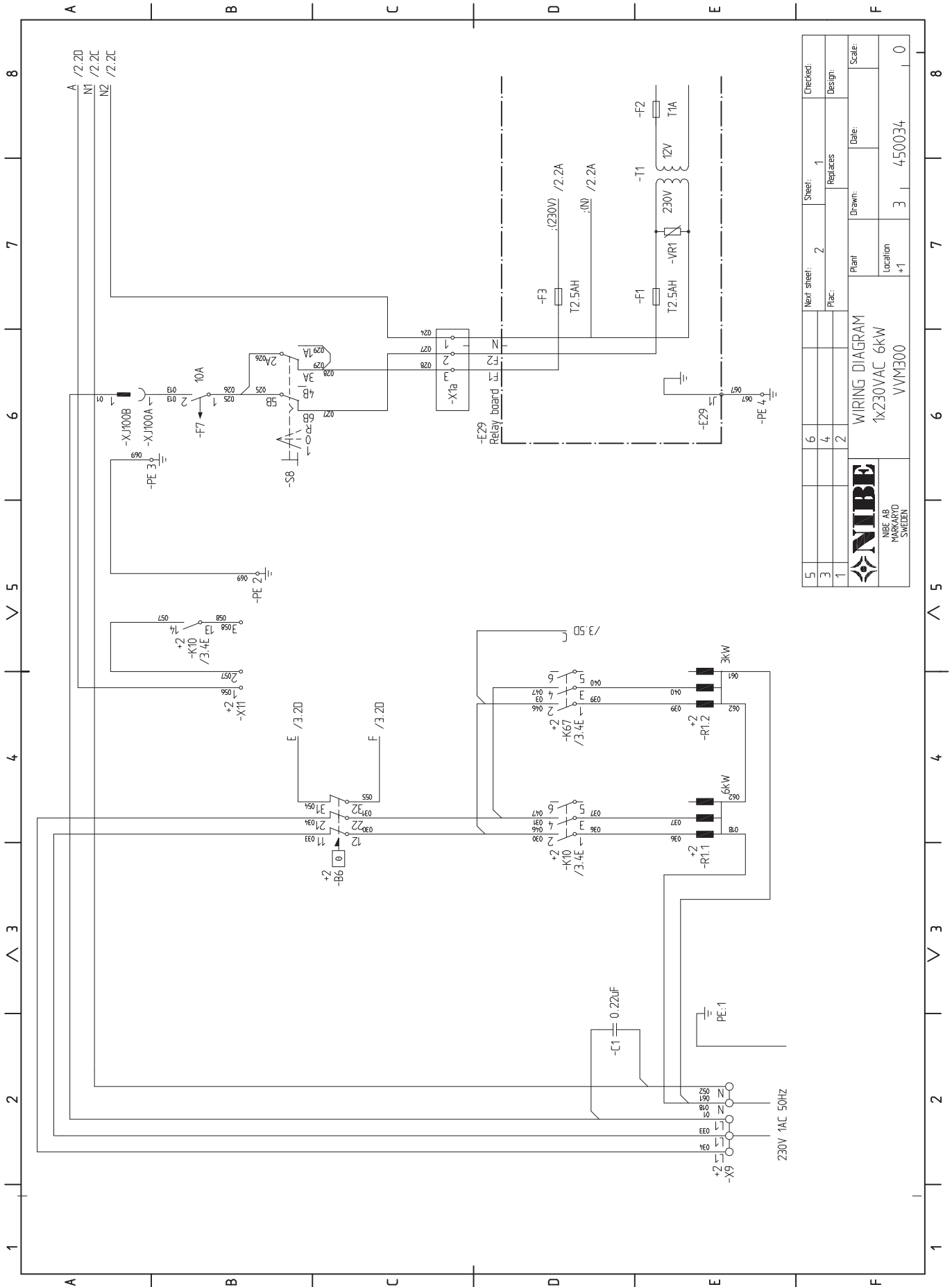
**Menu 9.5.x.19 Return**

Return to menu 9.5.x.0

**Menu 9.6.0 System Info**
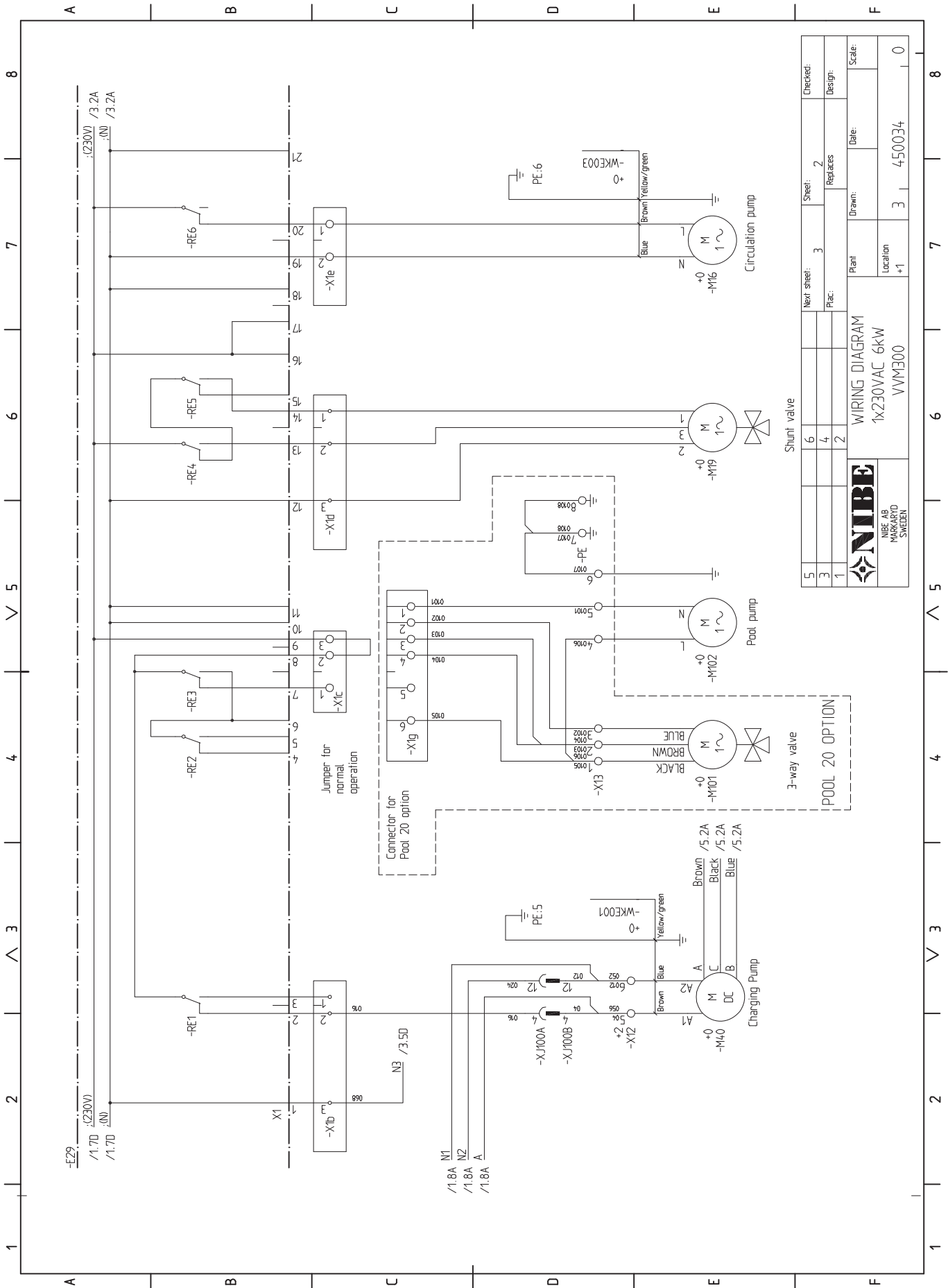
Only for service personnel.

**Menu 9.7 Return**

Return to menu 9.0.

# Electrical circuit diagram

## Electrical circuit diagram

## Electrical circuit diagram

For unvented systems only

Shut off valve inlet from F20xx

SHUT OFF
VALVE
OPTION

WIRING DIAGRAM
1x230VAC 6kW
VVM300

NIBE AB
MARKARYD
SWEDEN

3-way valve

BLUE
BROWN
BLACK

## Electrical circuit diagram



Temperature sensor supply line
Temperature sensor return
Temperature sensor hot water
Temperature sensor supply line 2
Temperature sensor return 2
Room sensor

-B89
-B93
-B83
-RG05

-XJ89
-XJ93
-XJ83

Low priority alarm

C
NC
NO

X3

MAX 250V / 2A

+2
-E2
EBV Control Card

Extra hot water

X4

X6

-X5B

Jumper for 1x230V

Temp sensor
Immersion heater operation

-B88

-X88

-X5A

X2   X5

MAX 250V / 2A

High priority alarm

C NC NO

X1

-B15

-T21C
-T21B
-T21A

Pool temp sensor
Ext. temp. adj. 2
Load monitor 3
Load monitor 2
Load monitor 1
Centralised load control / Tariff
Ext. temp. adj.
Outdoor sensor

WIRING DIAGRAM
1x230VAC 6kW
VVM300

NIBE AB
MARKARYD
SWEDEN

450034

+2
-WKF003
20-pol. L=49 mm

+2
-E2
EBV Control Card

X10

JP2

+2
-WKF005
8/8 L=500mm

+2
-E34
CPU Card

JP4

JP5

+2
-E35
Speed control card

X4

X5

:1
:2
:3
:4
:5
:6
:7
:8

+2
-WKO04
8/8 L=500mm

X2

X1

X4:GND
X4:B
X4:A

X3:GND
X3:B
X3:A

SELV

To Fighter 20xx

+2-E12
Modular-Cable

ON  OFF
1
2
3
4

+1
-WKF002
8/8 L=1100mm

+0
-WKF001
8/8 L=500mm

+0
-E29
Relay Card

+0
-E1
Display Card

Brown
Black
Blue

/2.3E
/2.3E
/2.3E

Checked:
Design:
Scale:

Sheet: 5
Replaces
Date:

Next sheet:
Plac:

Drawn:

Plant
Location +1

WIRING DIAGRAM
1x230VAC 6kW
VVM300

NIBE AB
MARKARYD
SWEDEN

450034

0

3

5
3
1

6
4
2

**Electrical circuit diagram**

## Sensor placement



## Temperature sensor data

| Temperature (°C) | Resistance (kΩ) | Voltage (V) |
|---|---|---|
| -40 | 102,35 | 4,78 |
| -35 | 73,51 | 4,70 |
| -30 | 53,44 | 4,60 |
| -25 | 39,29 | 4,47 |
| -20 | 29,20 | 4,31 |
| -15 | 21,93 | 4,12 |
| -10 | 16,62 | 3,90 |
| -5 | 12,71 | 3,65 |
| 0 | 9,81 | 3,38 |
| 5 | 7,62 | 3,09 |
| 10 | 5,97 | 2,80 |
| 15 | 4,71 | 2,50 |
| 20 | 3,75 | 2,22 |
| 25 | 3,00 | 1,95 |
| 30 | 2,42 | 1,70 |
| 35 | 1,96 | 1,47 |
| 40 | 1,60 | 1,27 |
| 45 | 1,31 | 1,09 |
| 50 | 1,08 | 0,94 |
| 55 | 0,83 | 0,76 |
| 60 | 0,69 | 0,65 |
| 65 | 0,56 | 0,54 |
| 70 | 0,46 | 0,46 |
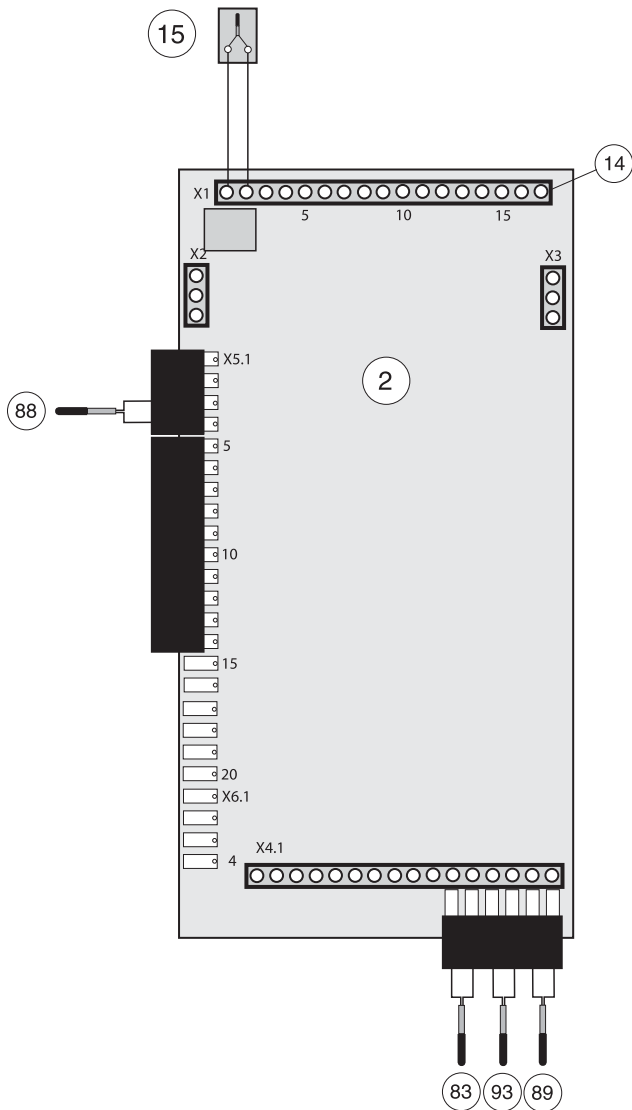
15   Outside sensor

83   Temperature sensor, hot water

88   Temperature sensor, immersion heater operation
(upper submerged tube)

89   Temperature sensor, supply line

93   Temperature sensor, return

## Dimensions and setting-out coordinates

Required space for removing the front cover.

70

15

1880

A

Adjustable 15-40

250 *

35
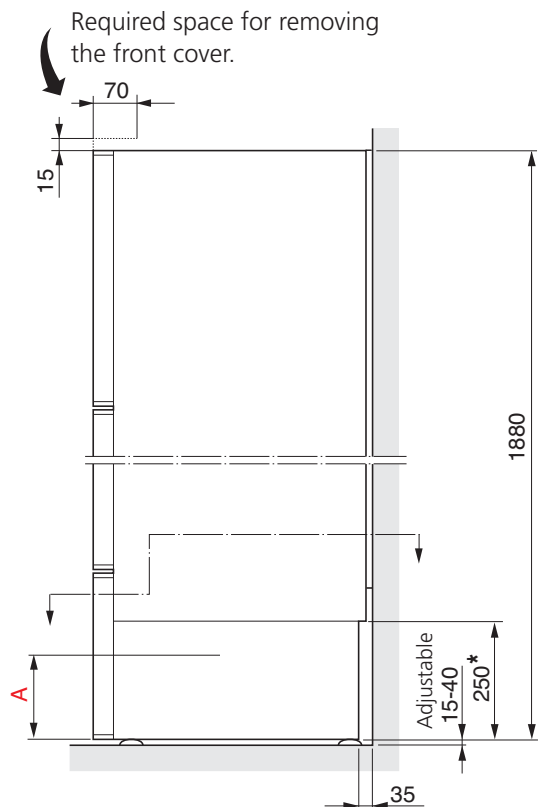
* Free height for pipe and cable routing from rear.

Communication cable for F20XX Ø 25

Outside sensor Ø 16

Electrical supply Ø 25
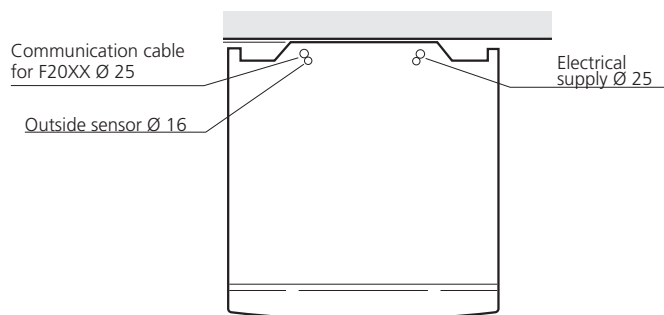
Supply, outdoor sensor and communication cable run in HP pipe to then be routed down to relevant terminal block.

40

60

470

90

520

600

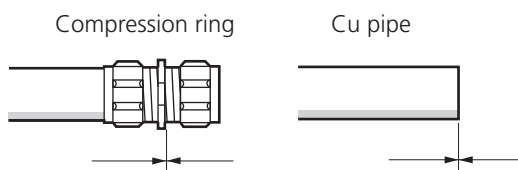35

C

70

40

20

110

210

B

615
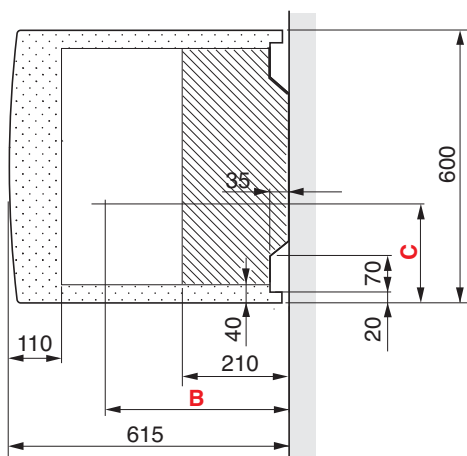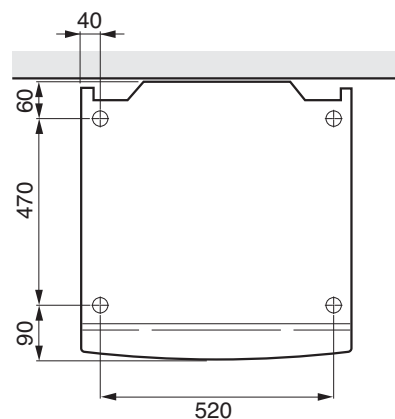
Pipes must not be run from the floor in the area indicated by dots.

When running pipes in the hatched area, make sure there is space to change the expansion vessel. **A** measurement 150 mm.

The lower section of the sides can be removed during installation. This also facilitates access from the sides.
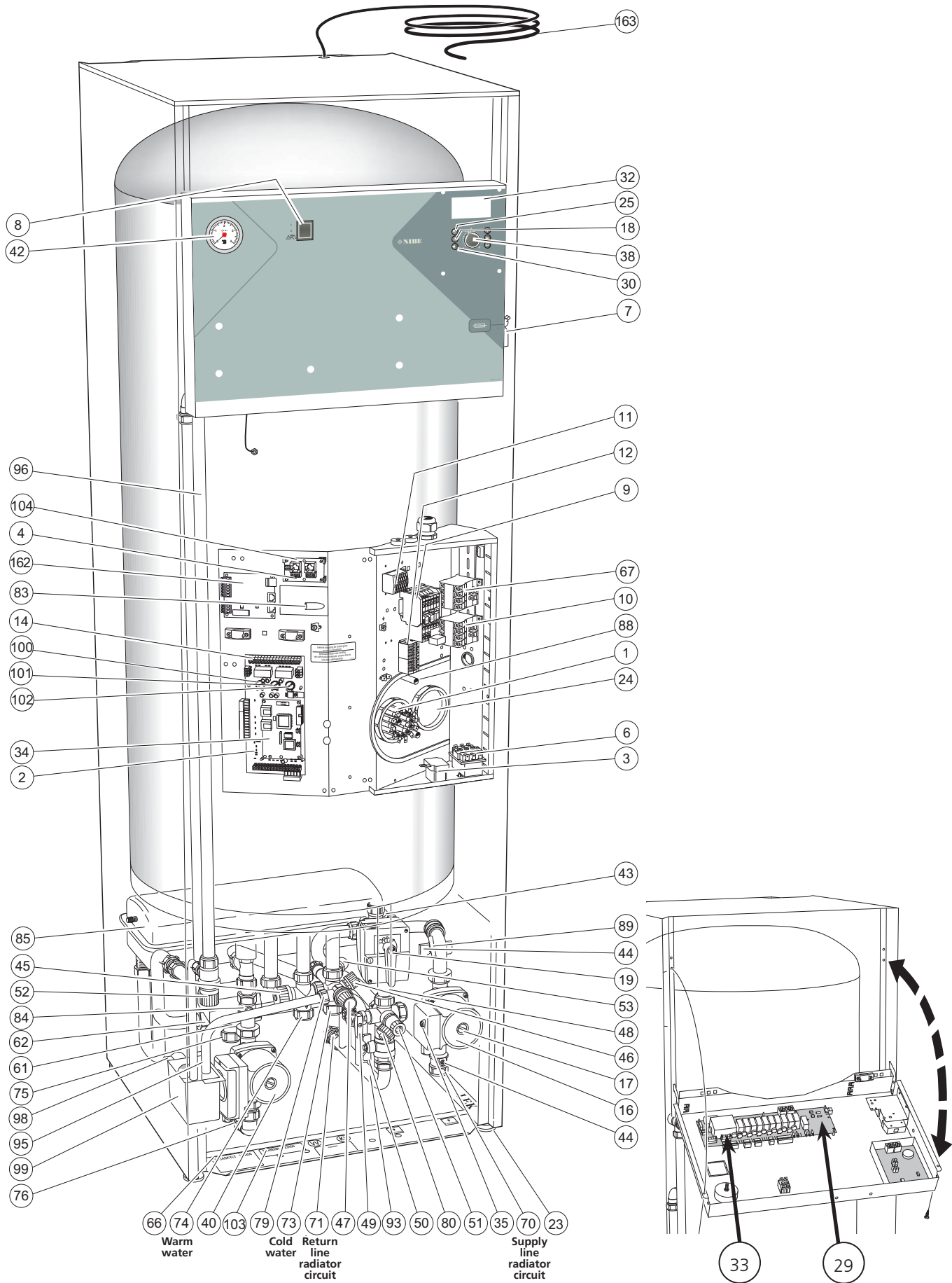
**A**, **B** and **C**: See "Connection" in "Component list".

## Measuring principle

Compression ring          Cu pipe

# Technical specifications

## Component locations



Warm water

Cold water

Return line radiator circuit

Supply line radiator circuit

*NIBE VVM 300*

## List of components

| | | | |
|---|---|---|---|
| 1 | Immersion heater 6 kW | 34 | CPU card |
| 2 | Load monitor card | 35 | Capacity setting, circulation pump |
| 3 | Operating thermostat, backup heating | 38 | Knob, Offset heating curve |
| 4 | Communication socket, communication cable F20XX | 40 | Charge pump |
| 6 | Temperature limiter | 42 | Pressure gauge, boiler |
| 7 | Miniature circuit-breaker | 43 | Shunt valve |
| 8 | Switch, position 1 - 0 - | 44 | Shutoff valve, pump and supply radiator circuit |
| 9 | Terminal block, power supply | 45 | Mixer valve |
| 10 | Contactor, electrical step II, 4 kW | 46 | Filler valve, hot water heater |
| 11 | Terminal block, contactors | 47 | Safety valve, hot water heater |
| 12 | Terminal block, three way valve, charge pump | 48 | Cartridge non-return valve |
| 14 | Terminal block | 49 | Combined filling and non-return valve, heating system |
| 15 | Outside sensor | 50 | Shutoff valve, return line radiator circuit |
| 16 | Circulation pump, heating medium | 51 | Drain valve, heating system |
| 17 | Venting screw, circulation pump | 52 | Safety valve, heating system |
| 18 | Pushbutton, Extra hot water | 53 | Vacuum valve |
| 19 | Shunt motor with handwheel | 61 | Motor, three way valve |
| 24 | Not used | 62 | Shuttle valve |
| 25 | Push button "Operating mode" | 66 | Rating plate |
| 29 | Relay card with power supply unit | 67 | Contactor, electrical step I, 2 kW |
| 30 | No function | | |
| 32 | Display unit | | |
| 33 | Fine wire fuse 2.5 A T | | |

| | | Connection | | Setting out dimensions | | |
|---|---|---|---|---|---|---|
| | | | | A | B | C |
| 70 | Supply line, radiator circuit | From below, compression ring Ø 22 mm | | 100 | 465 | 90 |
| 71 | Return line, radiator circuit | From rear, compression ring Ø 22 mm | | 60 | 255 | 190 |
| 73 | Cold water connection | From below, compression ring Ø 22 mm | | 260 | 465 | 290 |
| 74 | Hot water outlet from hot water heater | From below, compression ring Ø 22 mm | | 290 | 465 | 345 |
| 75 | Docking, incoming from F20XX | From rear, compression ring Ø 22 mm | | 150 | 215 | 420 |
| 76 | Docking, outgoing to F20XX | From rear, compression ring Ø 22 mm | | 30 | 435 | 440 |
| 79 | Drain and overflow water connection, heater | R 15 male (with compression ring not removed) | | | | |
| 80 | Drain connection, heating system | R 15 male | | | | |
| 83 | Temperature sensor, hot water | | | | | |
| 84 | Shut-off valve, charge pump | | | | | |
| 85 | Expansion vessel | | | | | |
| 88 | Temperature sensor, immersion heater operation | | | | | |
| 89 | Temperature sensor, supply line | | | | | |
| 93 | Temperature sensor, return | | | | | |
| 95 | Overflow pipe, safety valve hot water heater | | | | | |
| 96 | Overflow pipe, safety valve heating | | | | | |
| 98 | Overflow water discharge | PVC-pipe Ø 32 mm (outside diameter) | | | | |
| 99 | Overflow cup, waste water | | | | | |
| 100 | Knob, setting "Fuse" | | | | | |
| 101 | Knob, setting "Max electrical output" | | | | | |
| 102 | Knob, "Max boiler temperature setting" | | | | | |
| 103 | Serial number | | | | | |
| 104 | Communication card | | | | | |
| 162 | Control card, charge pump | | | | | |
| 163 | Cable, electrical supply, 2–2,5 m | | | | | |

# Accessories

F2016-6  Part no. 064 081
F2016-8  Part no. 064 082
F2016-11  Part no. 064 083



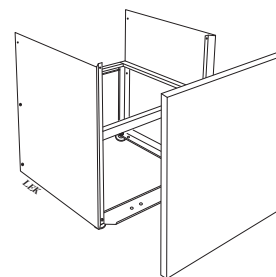**Extra shunt ESV 20**
Part no. 089 317



**Room thermostat RT 10**
Part no. 418 366
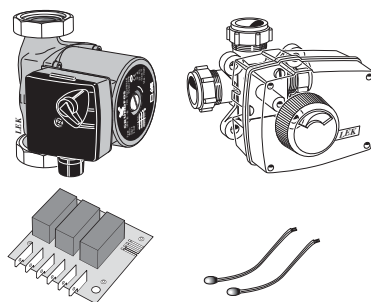


**Lower cabinet**
Height: 375 mm.
Part no. 089 196
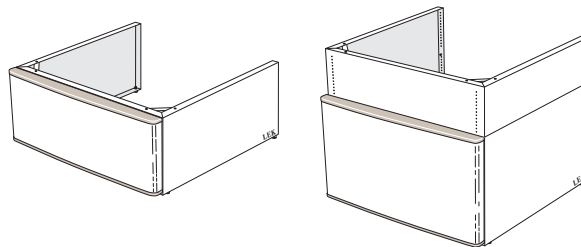


**Base extension**
Height: 125 mm.
Part no. 089 195



**Room unit RE 10**
Part no. 067 004
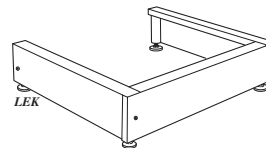


**Over cabinet**
Height: 245 mm.  Part no 089 424
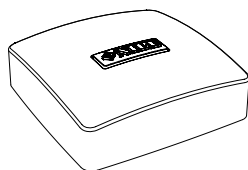Height: 345 mm.  Part no 089 426
Height: 385-535 mm.  Part no 089 428



**POOL 20**
Part no. 064 006

## Technical specifications

$C\:E$  | IP 21 |

| | |
|---|---|
| Height (excl. foot: 15 – 40 mm) | 1 880 mm |
| Required ceiling height | 2 000 mm* |
| Width | 600 mm |
| Depth | 615 mm |
| Weight | 160 kg |
| Volume total | 280 litres |
| Volume double jacket | 125 litres |
| Volume, hot water heater | 155 litres |
| Volume, expansion vessel | 12 litres |
| Supply voltage | 230 V~ 1-phase + N |
| Output immersion heater | 6 kW |
| Rated output heating medium pump | 45 / 75 / 110 W (adjustable) |
| Rated output charge pump | 6 – 70 W (speed controlled) |
| Enclosure class | IP21 |
| Design pressure, hot water heater | 1,0 MPa (10 (bar) |
| Cut-off pressure, hot water heater | 0,9 MPa (9 (bar) |
| Max permitted pressure in double jacket volume | 0,25 MPa (2.5 (bar) |
| Design pressure in double jacket volume | 0,25 MPa (2.5 (bar) |
| Pre-pressure expansion vessel | 0,5 bar (5 mvp) |
| Adjustable max boiler temperature | 55 – 80 °C |
| Part no. | 069 013 |

*The ceiling height becomes 1960 mm with the feet and front cover removed.

## Enclosed kit



Outside sensor