INTELLIGENT HOT WATER

- Flexible all-in-one indoor module for heating and hot water.

- For upgrading existing heating systems or new buildings with requirements for high performance hot water.

- Together with NIBE VVM 500, NIBE's air/water heat pumps offer a complete system for heating and domestic hot water.

- A new generation control module with colour display and several new functions.

- Integrated solar coil and solar control for connection to solar panels or to a stove with back boiler.

- Simple connection to and control of external heat source (wood/oil/gas and immersion heater).

- Prepared for pool heating.

- Prepared for control of two or more climate systems.

- Possible to control and monitor NIBE VVM 500 remotely.

- Integrated buffer tank for the heating system.

- High hot water capacity, (up to 500 litres at 40 °C at 12 litres/min) in combination with NIBE F2300.

- Stainless steel hot water coil

- Climate controlled shunt supply that monitors outdoor temperature

- Self regulating speed controlled charger and A-class designed heat pump

NIBE VVM 500

VVM 500 is a flexible indoor module. Together with air/ water outdoor modules F2300-14/-20 or F2026-6/-8/-10 it creates a complete system to supply heating and hot water requirements of buildings. VVM 500 can receive energy from several different alternatives, such as outdoor heat pumps F2300 and F2026. It can also be supplemented with energy from the existing boiler instead of using the internal immersion heater.

You can also use solar power. There are eight complete solar packages with panels and accessories that use the internal solar coil and control. Solar energy is primarily used to cover hot water needs. When enough water is heated, solar energy can be used to heating the house and even a pool. Another energy alternative is a stove with back boiler.

A new generation of heat pumps
DESIGNED FOR EARTH

# HOW THE NIBE™ VVM 500 WORKS

System diagram

VVM 500 is designed for connection and communication with NIBE's air/water heat pumps, and offer a complete heating system. NIBE's air/water pumps cover most of a home's heating and hot water requirements. VVM 500 operates together with NIBE's air/water heat pumps. If the outdoor temperature drops to a level below the stop temperature of the heat pump the VVM 500 heats the home.

Together with F2300, VVM 500 satisfies the heating requirements of buildings from 12–24 kW in a climate with outdoor temperature above -25 °C. Where less heating is required, use the F2026. Use the NIBE VPDIM software to decide the correct heat pump size. The hot water capacity depends on which outdoor module you select and whether and add-ons are allowed. For example with the F2300-VVM 500 system the tap volume is 500 litres (40 °C) at 12 litres/min when the tank is filled with just the F2300.

When combined with an outdoor pool in the summer, The F2300-VVM500 system's outdoor unit does not normally need higher dimensioning. This is because the building's heating requirement is less in the summer time and F2300's output and efficiency increases with warmer outdoor temperatures. Solar panels connected to VVM 500 can also be used to heat the pool.

The VVM 500 and NIBE's air/water heat pumps offer complete flexibility. VVM 500 is prepared for pool heating, solar panels or when other external heat sources should be included in the system.

Basic docking with hot water and a heating system
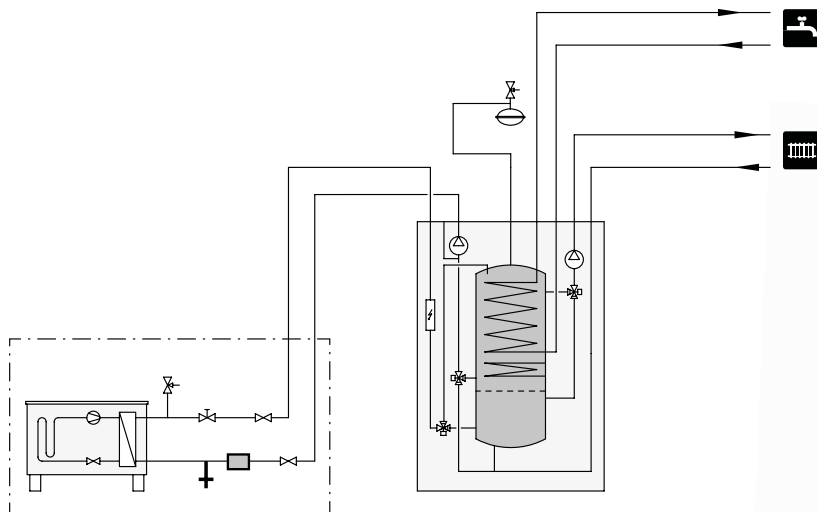
NIBE™ VVM 500 – FLEXIBILITY

Design

NIBE VVM 500 is equipped with an intelligent and easy to use controller. The controller optimises the two circulation pumps. Both the flow to the outdoor heat pump and the flow to building are adapted to actual demands on heating or hot water. The required input is defined by the installer during the start up procedure.

The controller is intuitive for both installers and end users. If a problem occurs there are several ways to log and analyze selected parameters. Software updates are downloaded via the USB connection.

The hydraulic concept offers true flexibility and a robust installation. The lower part of the cylinder is used as a heating buffer volume, meaning no extra buffer volume independent of the building's heating system is needed.

Energy is provided to the NIBE VVM 500 by the outdoor heat pump to the top of the tank or to the bottom depending on demand. Solar panels can be connected to the built in coil and solar energy can be used for hot water, heating a pool or indoor heating. In the latter case heating water above the stratification plate is transferred into the heating system. An existing boiler can be connected to the upper water volume. Another way is to feed energy using the immersion heater. It can be used for heating and hot water backup. The controller decides when and how much of the available energy sources should be fed into the NIBE VVM 500. It also prioritizes demands for heating, hot water and swimming pool.

System overview

|	F2300 - VVM 500	F2026 - VVM 500
Max recommended flow line temperature for heating system.	65	55
Max hot water capacity with outdoor section	24 l/min, 250 l, 40 °C DUT* >-25 °C	16 l/min, 175 l, 40 °C DUT* >-20 °C
Available heating output at -20 °C (incl immersion heater)	15 kW (F2300-14) 19 kW (F2300-20)	9 kW, internal immersion heater
Available heating output at -25 °C	9 kW, internal immersion heater	9 kW, internal immersion heater
Available heating output, Outdoor temperature -24 °C (F2300) or -19 °C (F2026)	16 kW (F2300-14 and -24 C) 19 kW (F2300-20 and -24 C)	12 kW (F2026-6 and -19°C) 13 kW (F2026-8 and -19°C) 14 kW (F2026-10 and -19 C)
Available heating output, Outdoor temperature -26 °C (F2300) or -21 °C (F2026)	9 kW (F2300-14 and -26 C) 9 kW (F2300-20 and -26°C)	9 kW (F2026-6 and -21°C) 9 kW (F2026-8 and -21 C) 9 kW (F2026-10 and -21 C)
Internal immersion heater	9 kW	
Max connectable external addition	25 kW	
Max available heating output from VVM 500 with electrical addition (for example ELK 15)	24 kW	
Max connectable output for external additional coil (1.5 m2)	8 kW	
Max hot water temperature (with compressor)	65 °C	58 C
Max hot water temperature (with internal immersion heater)	75 C	65 °C
VVM 500 must be located in a frost and condensation free room at ambient temperature	5 – 30 C	
Max temperature in tank	85 C	

*Dimensioned outdoor temperature

GOOD TO KNOW ABOUT NIBE™ VVM 500

Quick and simple installation

- No extra buffer tank for the heating system is required as VVM 500 fully controls the heat pump and the heating system.
- New control with colour display and USB port.
- Installation help with step by step guide through the start-up process.
- Automatic setting of flow across heat pump and heating system.
- Factory installed components for best operational reliability and safe installation.
- Complete accessory program.

Transport and storage

NIIBE VVM 500 must be transported and stored upright and dry. The VVM 500 may, however, be carefully laid on its back when being moved into a building.
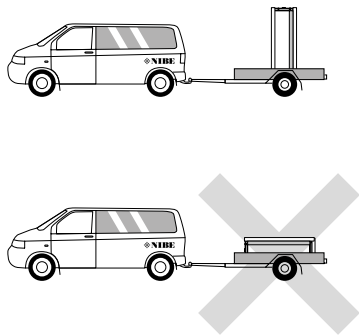
Assembly

Position VVM 500 on a firm base that can bear its weight, preferably on a concrete floor or foundation. Use the product's adjustable feet to obtain a horizontal and stable set-up.

The area where VVM 500 is located must be equipped with floor drainage.

Installation area

Leave a space of 500 mm in front of the product. All service on VVM 500 can be carried out from the front.
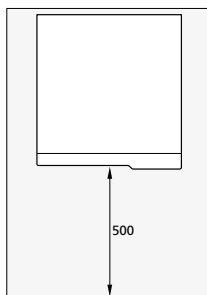
NOTE! Leave 10-25 mm free space between the indoor module and the wall behind for routing of cables and pipes.

Maintenance

A minimum level of maintenance is required. Only safety valves require checking. All essential components can be accessed from the front. This facilitates service and maintenance.

Installation

VVM 500 is easy to install. All pipe connections are easily accessible. This is especially useful for the replacement market.

Equipment

VVM 500 is equipped with a drain and reversing valve. In addition, VVM 500 is equipped with climate controlled automatic bypasses with outdoor and flow sensors, shunt valve, charge and circulation pump.

Expansion vessel

Dimensioned as 5 % of the maximum system volume (that is 500 litres plus maximum circulating volume in the hot circuit).

Design

VVM 500 is equipped with an intelligent control. This makes for easy operation at the same time as always enabling the indoor module to run as efficiently as possible. The control manages the automatic bypass and circulation pumps. Current temperatures and set values can be shown on the display.

The insulation consists of moulded, freon-free polyurethane which is equivalent to approximately 200 mm mineral wool.

The outer casing is of white powder-coated steel plate.

Pipe dimensions
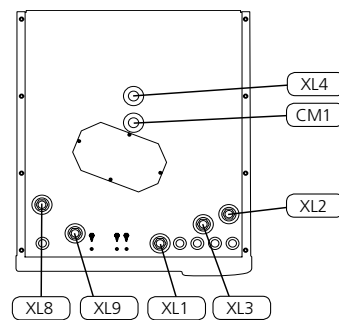
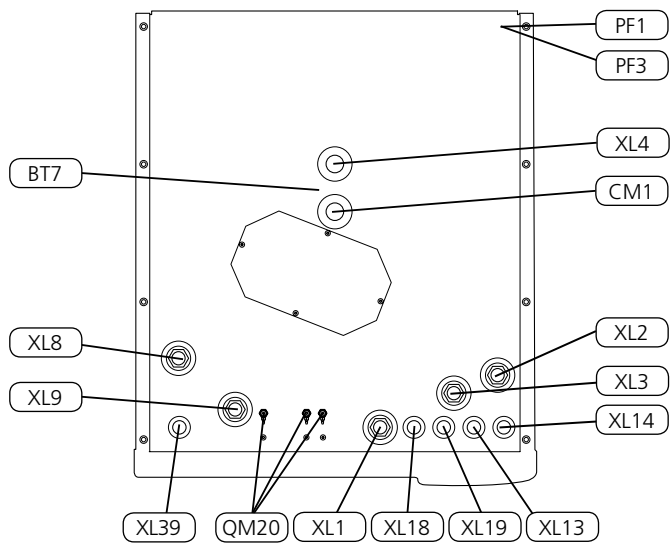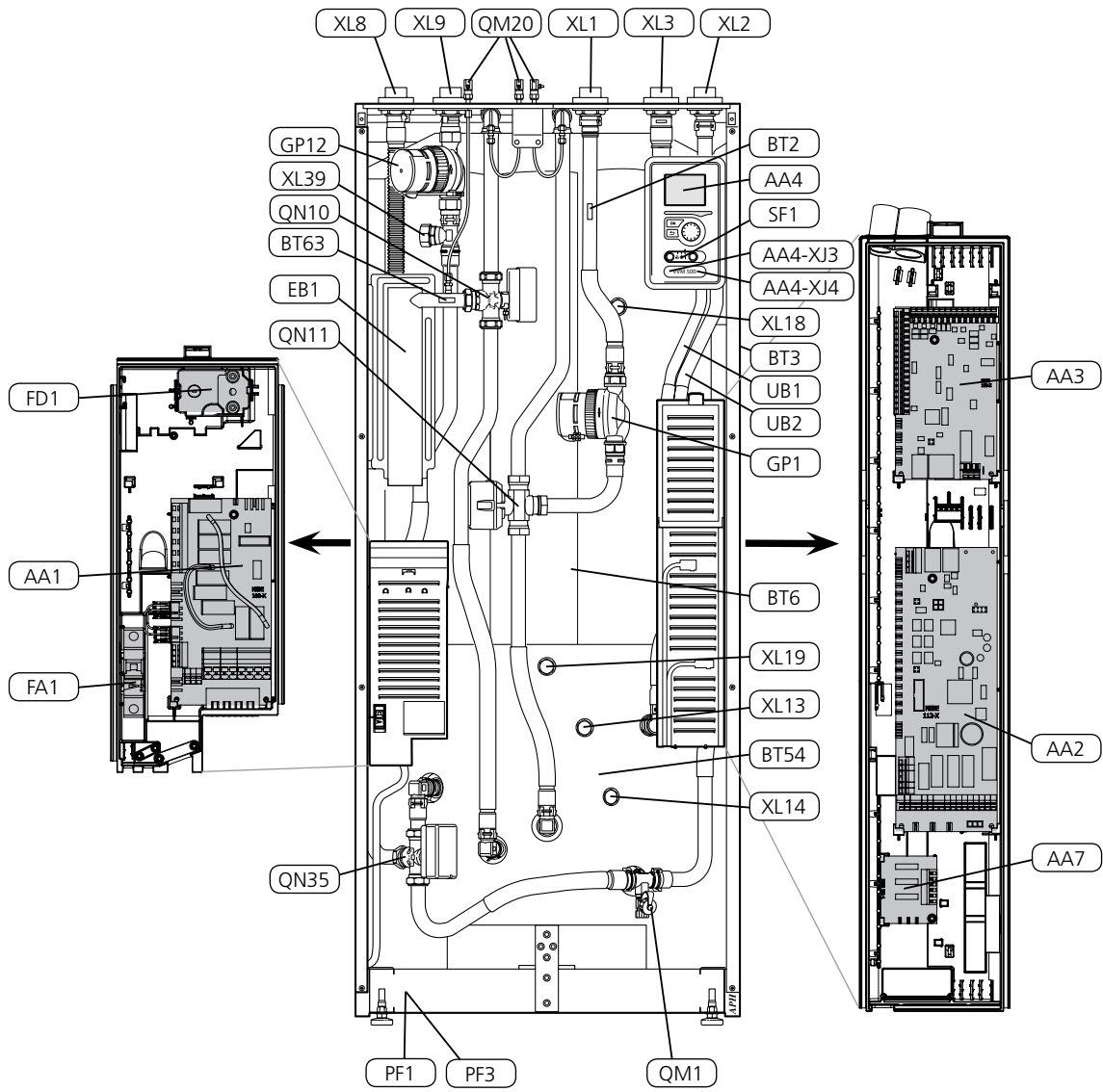| Connection		
CM1 Expansion tank (connection) Ø	G20	internal
XL1 Heating medium, flow line Ø	G25	internal
XL2 Heating medium, flow line Ø	G25	internal
XL3 Cold Water	G25	internal
XL4 Hot Water Ø	G25	exernal
XL8 Connection, docking in heating medium Ø	G25	internal
XL9 Connection, docking out heating medium Ø	G25	internal

GOOD TO KNOW ABOUT NIBE™ VVM 500

Dimensions
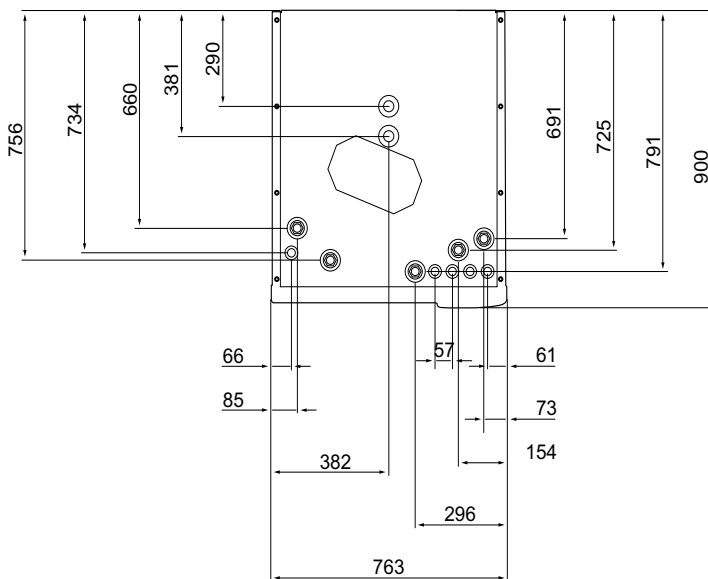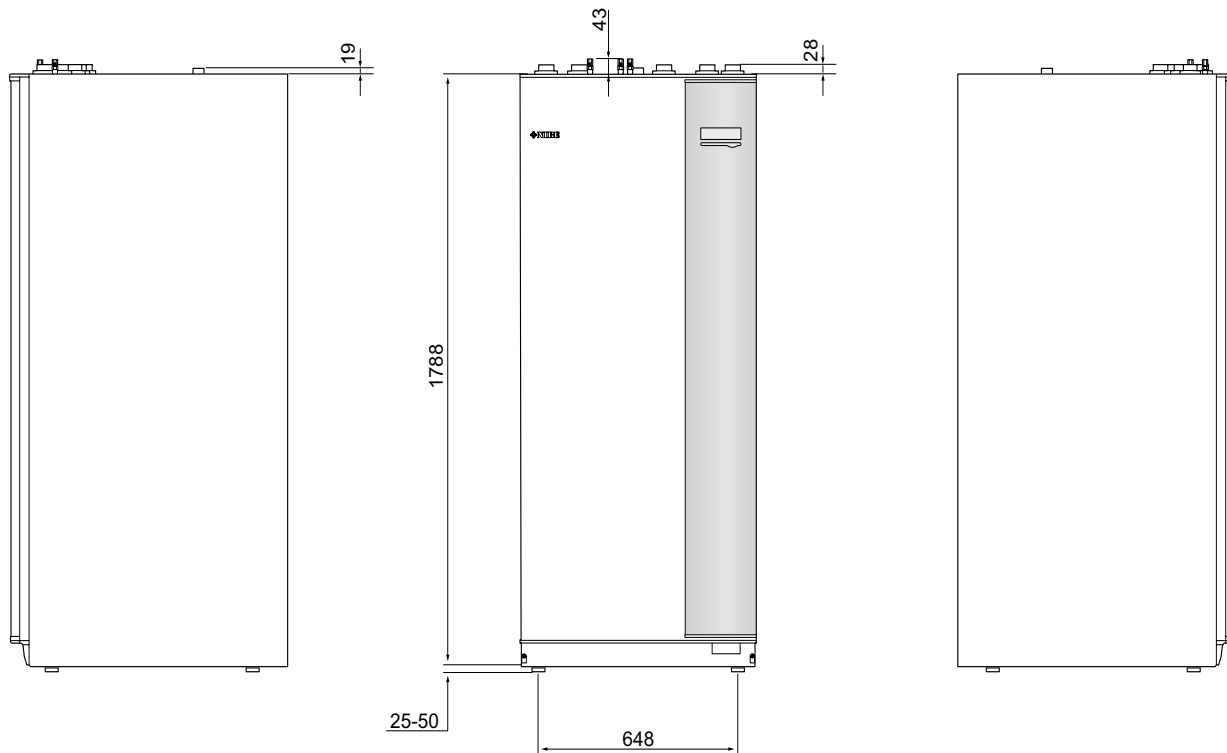
GOOD TO KNOW ABOUT NIBE™ VVM 500

Indoor module design

GOOD TO KNOW ABOUT NIBE™ VVM 500

List of components

Pipe connections

XL1	Connection, heating medium flow line
XL2	Connection, heating medium return line
XL3	Connection, cold water
XL4	Connection, hot water
XL8	Connection, docking in heating medium
XL9	Connection, docking out heating medium
XL13	Connection, solar system flow line (SCA 30)
XL14	Connection, solar system return line (SCA 30)
XL18	Connection, docking in high temp (DEH 500)
XL19	Connection, docking out high temp (DEH 500)
XL39	Connection, docking pool (POOL 500)

HVAC components

CM1	Expansion tank (connection)
GP1	Circulation pump
GP12	Charge pump
QM1	Drain valve, heating medium
QM20	Venting, climate system
QN10	Reversing valve, climate system/heating medium, flow line
QN11	Mixing valve
QN35	Reversing valve, climate system/heating medium, return line

Sensors etc.

BT2	Temperature sensors, heating medium flow
BT3	Temperature sensor, heating medium return*
BT6	Temperature sensor, hot water, control
BT7	Temperature sensor, hot water, display*
BT54	Temperature sensor, solar coil
BT63	Temperature sensor, heating medium supply after immersion heater

Electrical components

AA1	Immersion heater card
AA2	Base card
AA3	Input circuit board
AA4	Display unit
	AA4-XJ3 USB port
	AA4-XJ4 Service socket
AA7	Extra relay circuit board
EB1	Immersion heater
FA1	Miniature circuit-breaker
FD1	Temperature limiter
SF1	Switch

Other information

PF1	Rating plate
PF3	Serial number plate
UB1	Cable grommet
UB2	Cable grommet

* Not visible in the image
Designations in component locations according to standard IEC 81346-1 and 81346-2
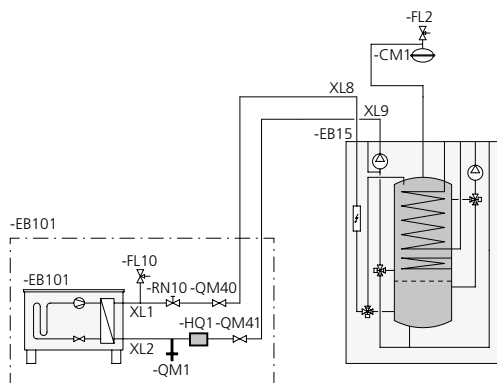
INSTALLATION

VVM 500 is easy to install. All pipe connections are easily accessible.

## Installation alternative

Heat pump

All outdoor pipes must be thermally insulated with at least 19 mm thick pipe insulation.

VVM 500 is not equipped with shut off valves; these must be installed outside the indoor module to facilitate any future servicing.
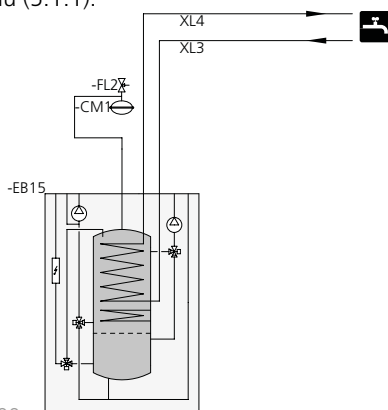

Electric boiler mode

Connect the pipe for docking in from the heat pump (XL8) to the pipe out from the heat pump (XL9).
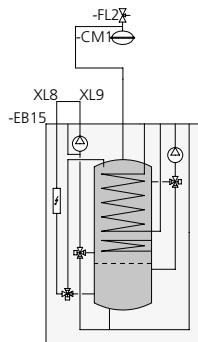
Cold and hot water

A mixing valve must be installed if the factory setting is changed so that the temperature can exceed 60 °C. If the factory setting is changed, national regulations must be observed. The setting is made in menu (5.1.1).

Heating medium side

When connecting to a system with thermostats on all radiators/ underfloor heating coils, a relief valve must be fitted, or a thermostat must be removed to ensure sufficient flow.
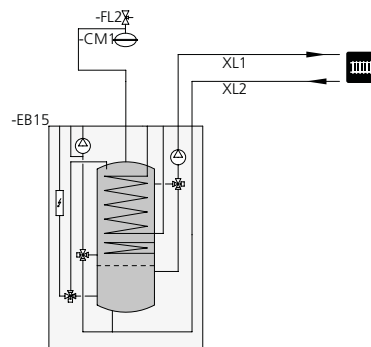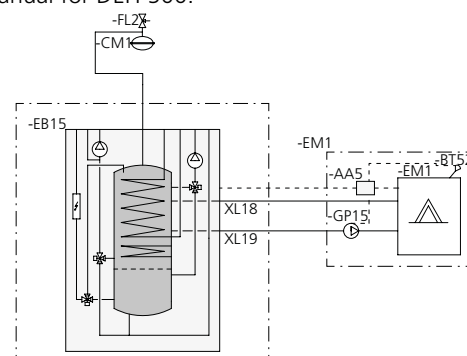

Two or more climate systems

When more than one climate system is to be heated, the following connection can be used.

For this connection accessory ECS 40/ECS 41 is required.

(Max 4 zones)
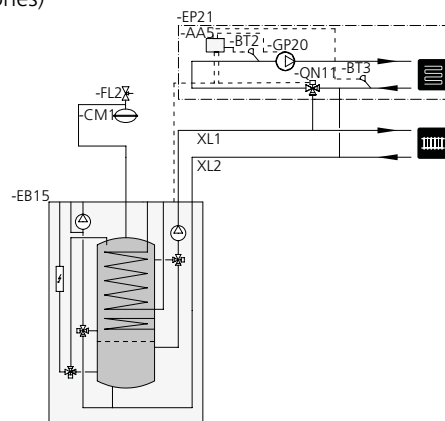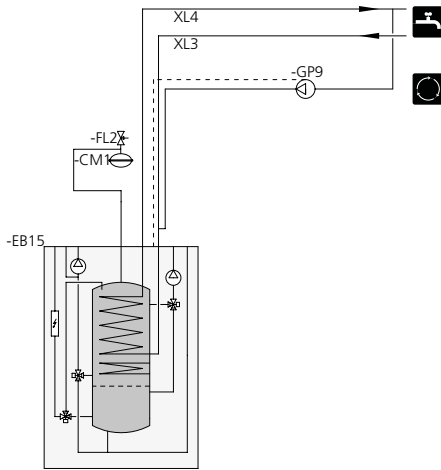

External heat source

Connection of gas/electric/oil boiler requires accessory DEH 500, see "Accessories" on the product sheet rear cover and the installation manual for DEH 500.

INSTALLATION

Connecting hot water circulation

To reduce the risk of bacterial growth in systems with hot water circulation, the temperature of the circulating water should not fall below 50 C. There should not be any non-circulatory hot water pipes. Adjust the hot water system so that the temperature does not fall below 50°C at the end of the system. In VVM 500 it is possible to schedule the connected pump (GP9).

Wood burning stove with back boiler

Connection to the wood burning stove with back boiler, max 8kW, requires accessory SCA 30, see Accessories on the rear cover and the installation manual for SCA 30. This docking provides both heat and hot water.
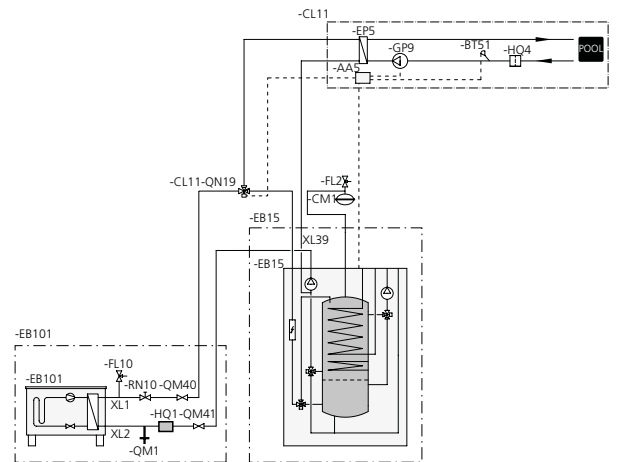

Sun

Connection to solar installation requires accessory SCA 30, see Accessories on the rear cover and the installation manual for SCA 30. This docking provides both heat and hot water.
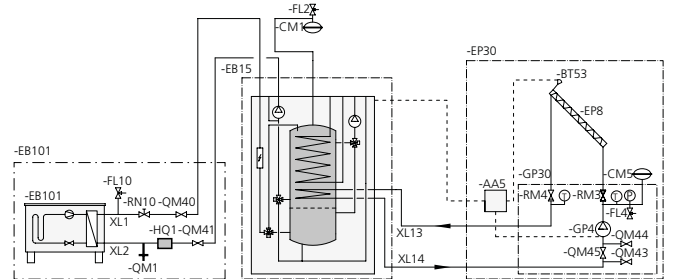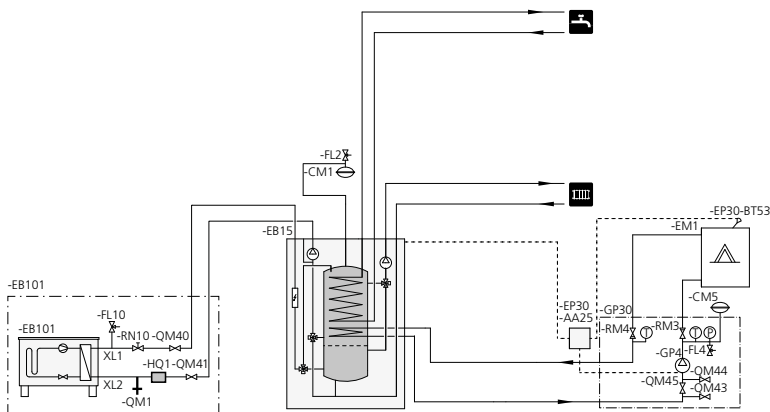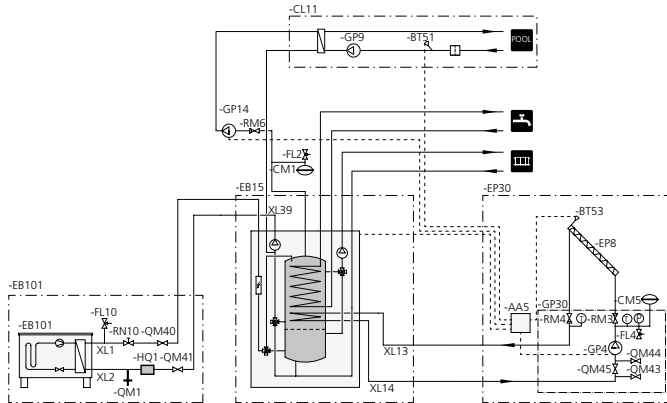

Pool

Pool heating is controlled by the pool sensor. In the case of low pool temperatures, the shuttle valve reverses direction and opens towards the pool exchanger. This connection requires the POOL 500 accessory, see Accessories on the rear cover and the installation manual for POOL 500.

INSTALLATION

Pool and solar

In this example the solar installation is connected. When solar heating has heated the tank to the desired stop temperature, the solar heat will be transferred to the pool. Charging the pool continues until the pool is fully heated or until the temperature in the tank falls below the desired stop temperature.

Pool with heat pump and solar

Charging of the pool is controlled by the pool sensor. In the case of low pool temperatures, the shuttle valve reverses direction and opens towards the pool exchanger. This connection requires the POOL 500 accessory, see Accessories on the rear cover and the installation manual for POOL 500.

In this example the solar installation is connected. When solar heating has heated the tank to the desired stop temperature, the solar heat will be transferred to the pool. Charging the pool continues until the pool is fully heated or until the temperature in the tank falls below the desired stop temperature.
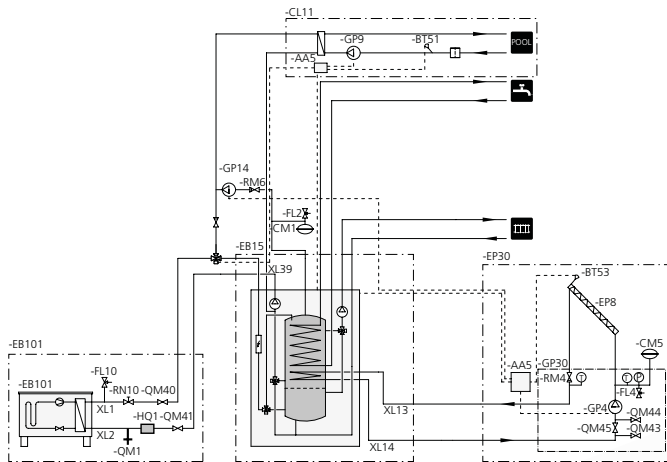
Electrical connections

General

All electrical equipment, except the outdoor sensors, room sensors and the current sensors are already connected at the factory.

- Disconnect the indoor module before insulation testing the house wiring.
- When the building is equipped with an earth-fault breaker, VVM 500 should be equipped with a separate one.
- The electrical circuit diagram for the indoor module is at the end of this Installer manual.
- Communication and sensor cables to external connections must not be laid close to high current cables.
- The minimum area of communication and sensor cables to external connections must be 0.5 mm² up to 50 m, for example EKKX or LiYY or equivalent.
- You must use cable grommets UB1 and UB2 when cable routing in VVM 500. In UB1 and UB2 the cables are inserted through the indoor module from the back to the front.

Miniature circuit-breaker

The indoor module and a large proportion of its internal components are internally fused by a miniature circuit breaker (FA1).

Temperature limiter

The temperature limiter (FD1) cuts the current supply to the electrical addition if the temperature rises to between 90 and 100 degrees C and is manually reset.

Settings

Electrical addition - maximum output

The immersion heater can be set to a maximum of 9 kW. Delivery setting is 9 kW.

The immersion heater output is divided into 4 steps, according to the table in the Installer manual.

Setting maximum output in the electrical addition is done in menu 5.1.12.

Standby mode

When the indoor module switch (SF1) is set to emergency mode only the most necessary functions are activated.
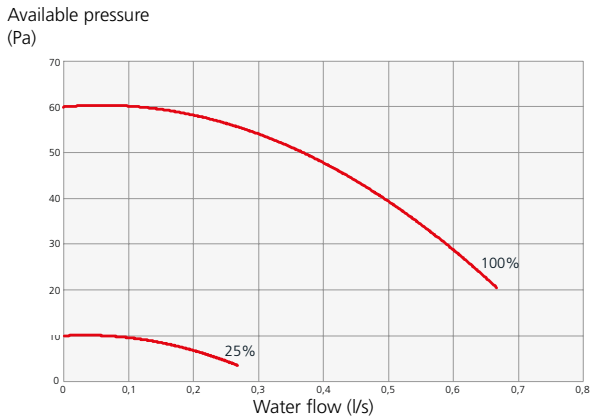
The hot water capacity is reduced.

The load monitor is not connected.

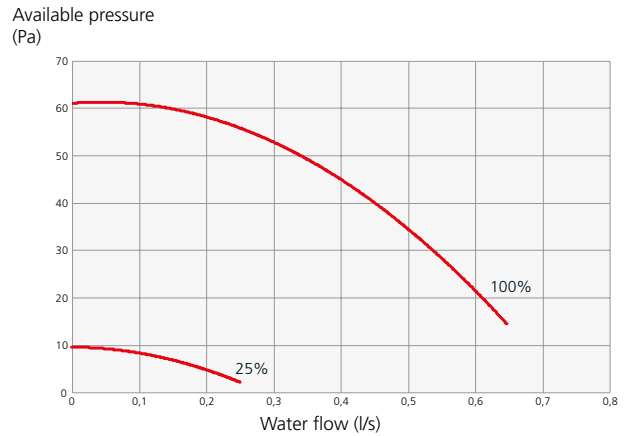Temperature is fixed in the flow line

INSTALLATION

Pump capacity diagram

Available pressure, circulation pump for heating systems, GP1
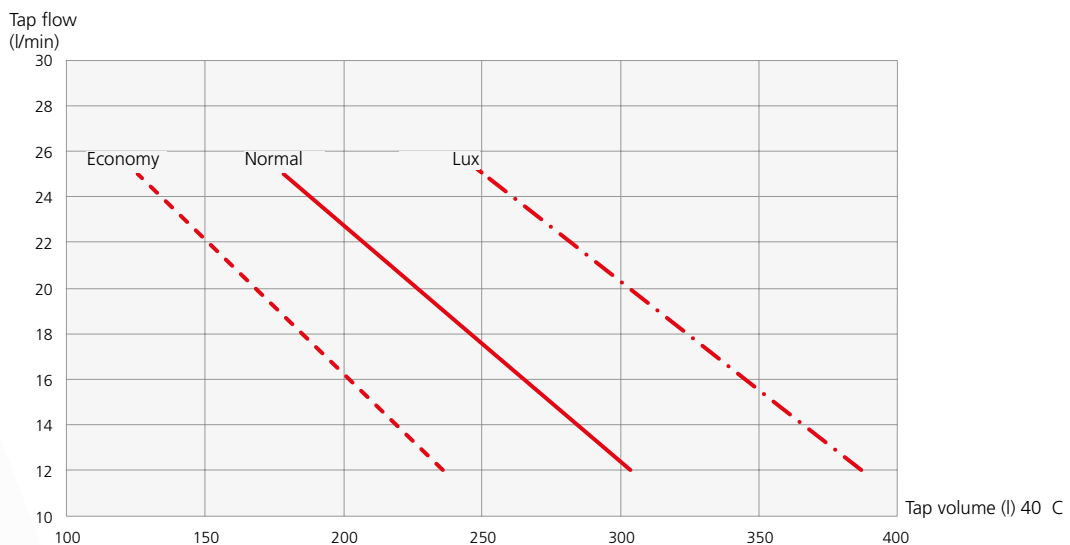

Available pressure, charge circulation pump, GP12

Water capacity

Hot water capacity NIBE VVM 500 with NIBE F2026/F2300

The diagram above displays what hot water capacity VVM 500 can supply at the different selectable comfort modes.

The difference between the selectable modes is the temperature of the hot tap water. Higher temperature means hot water lasts longer.

economy: This position gives less hot water, but is more economical. This mode can be used in smaller households with a small hot water requirement.

normal: Normal mode gives a larger amount of hot water and is suitable for most households.

luxury: Lux mode gives the greatest possible amount of hot water. In this mode, the immersion heater, as well as the compressor, is used to heat hot water, which may increase operating costs.

F2026 requires additional heat (internal or external) to reach Luxury.

In most cases, F2300 reaches all three settings (including Lux), with just a compressor.

THE DISPLAY

A large, easy to read multicoulour display gives everyone the chance to maximize the energy saving potential of this exciting green technology!

Display unit

Display, A

Instructions, settings and operational information are shown on the display. The easy-to-read display and menu system facilitates navigation between the different menus and options to set the comfort or obtain the information you require.

Status lamp, B

The status lamp indicates the status of the heat pump. It:

- lights green during normal operation.

- lights yellow in emergency mode.

- lights red in the event of a deployed alarm.

OK button, C

The OK button is used to:

- confirm selections of sub menus/options/set values/page in the start guide.

Back button, D

The back button is used to:

- go back to the previous menu.

- change a setting that has not been confirmed.

Control knob, E

The control knob can be turned to the right or left. You can:

- scroll in menus and between options.

- increase and decrease the values.

- change page in multiple page instructions (for example help text and service info).

Switch, F

The switch assumes three positions:

- On (I)

- Standby (⏻)

- Emergency mode (⚠)

A Display
B Status lamp
C OK button
D Back button
E Control knob
F Switch
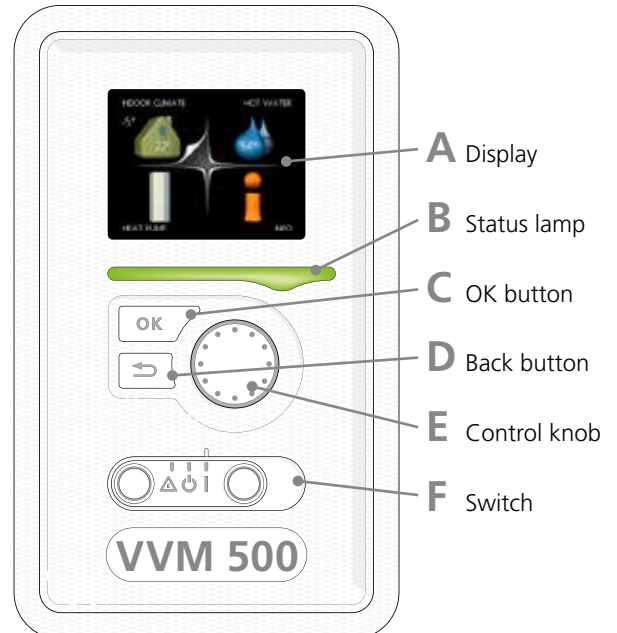
THE DISPLAY

Menu system

When the door to the heat pump is opened, the menu system's four main menus are shown in the display as well as certain basic information.

Menu 1 – Indoor climate

Setting and scheduling the indoor climate.

Menu 2 – Hot water

Setting and scheduling hot water production.

This menu only appears if a water heater is docked to the heat pump.

Menu 3 - Info

Display of temperature and other operating information and access to the alarm log.

Menu 4 – Heat pump

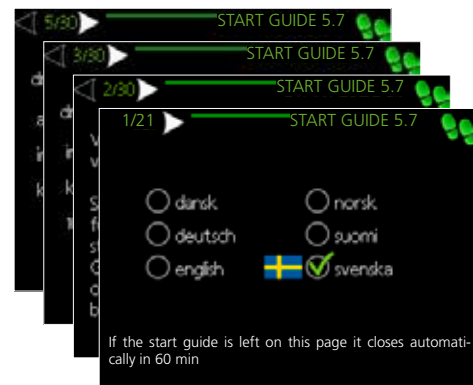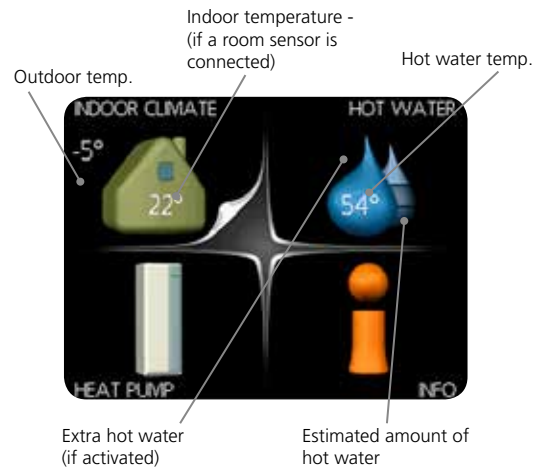Setting time, date, language, display, operating mode etc.

Menu 5 - Service

Advanced settings. These settings are not available to the user. The menu is visible by pressing the Back button for 7 seconds.

Start guide

The first time the heat pump is started a start guide is started. The start guide instructions state what needs to carried out at the first start together with a run through of the heat pump's basic settings.

The start guide ensures that the start-up is carried out correctly and cannot be bypassed. The start guide can be started later in menu 5.7.

Indoor temperature - (if a room sensor is connected)

Outdoor temp.

Hot water temp.

Extra hot water (if activated)

Estimated amount of hot water

START GUIDE 5.7
START GUIDE 5.7
START GUIDE 5.7
START GUIDE 5.7

dansk
deutsch
english
norsk
suomi
svenska

If the start guide is left on this page it closes automatically in 60 min

TECHNICAL SPECIFICATIONS

CE   **IP 21**

3x400V		
Max heat pump output [1]	kW	20
Additional power immersion heater	kW	9
Electrical data		
Rated voltage		400 V~ 3 NAC 50 Hz
Max operating current	A	16,2
Fuse	A	16
Power, HM pump	W	10 - 110
Output charge pump	W	10 - 110
IP class		IP 21
Heating medium circuit		
Energy class circ-pump		low energy
Energy class charge pump		low energy
Max system pressure heating medium	MPa	0.3 (3 bar)
Min flow	l/h	500
Max HM temp	C	70
Pipe connections		
Heating medium, CU pipe	G25	internal
Hot water connection	G25	internal
Cold water connection	G25	internal
Heat pump connections	G25	internal
Other information		
Indoor module		
Area HW coil	m²	5
Volume, total indoor module	l	500
Volume, buffer vessel	l	80
Area, solar coil	m²	1,5
Cut-off pressure, coil	MPa	1.0 (10 bar)
Max permitted pressure in indoor module	MPa	0.3 (3 bar)
Capacity hot water heating According to EN 255-3		
Tap volume 40°C at Eco comfort	l	235
Tap volume 40°C at Normal comfort	l	303
Tap volume 40°C at Luxury comfort	l	378
Idle loss according to DIN 4753-8	W	116
Dimensions and weight		
Width	mm	760
Depth	mm	900
Height	mm	1900
Required ceiling height	mm	2000
Weight (excl packaging)	kg	240
Part no.		069 400

1) Applies to outdoor air heat pump at 7/45 °C (outdoor temperature / Supply temperature)
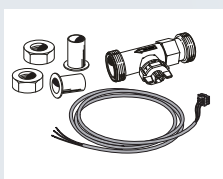
SUPPLIED COMPONENTS
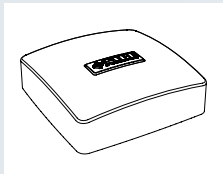
Outdoor sensor

Room sensor

Current sensor

O-rings

The kit of supplied items is placed on top of the product.

ACCESSORIES

NIBE™ EMK 500
Energy measurement kit
This accessory is used to measure the amount of energy VVM 500 produces and supplies for hot water and heating in the building.
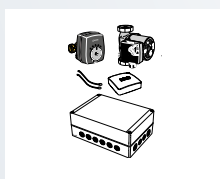
Part no.   067 178

NIBE™ ELK
External electrical addition
These accessories require accessory DEH 500 (step controlled addition).
ELK 26
Part no.   067 074
ELK 15
Part no.   067 022

NIBE™ ECS 40/ECS41
Extra shunt group
This accessory is used when VVM 500 is installed in houses with two or more different climate systems that require different supply temperatures.
ECS 40 (max 80 m²)
Part no.   067 061
ECS 41 (min 80 m²)
Part no.   067 099

NIBE™ HR 10
Auxiliary relay

Part no.   089 423

NIBE™ MODBUS 40
Communications module
MODBUS 40 enables VVM 500 to be controlled and monitored using a design outdoor temperature in buildings. Communication takes place using a MODBUS-RTU.

Part no.   067 144
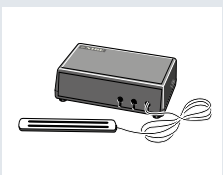
NIBE™ SMS 40
Communications module
SMS 40 enables VVM 500 to be controlled and monitored via SMS messages. The mobile application NIBE Mobile App can be used with a mobile telephone with the Android operating system .
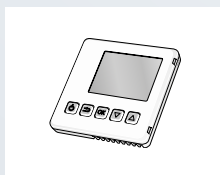
Part no.   067 073

NIBE™ POOL 500
Pool heating
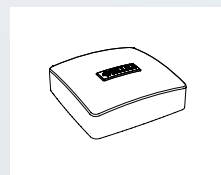POOL 500 is an accessory that enables pool heating with VVM 500.

Part no.   067 181
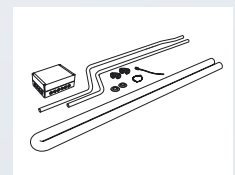

NIBE™ RMU 40
Room unit
RMU 40 means that control and monitoring of the indoor module can be carried out in a different part of the home to where VVM 500 is located.
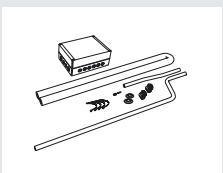
Part no.   067 179

NIBE™ RTS 40
Room sensor

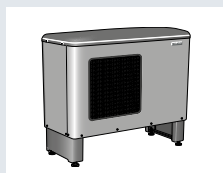Part no.   067 065

NIBE™ SCA 30 (solar)
Possible connection and control of solar heating.

Part no.   067 179

NIBE™ DEH 500 (oil/electricity/gas)
Possible connection and control of external heat source.

Part no.   067 180

NIBE™ F2026
Air/water heat pump

6 kW   Part no. 064 084
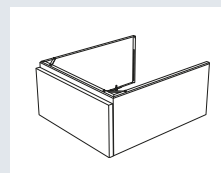**8 kW**   Part no. 064 085
10 kW   Part no. 064 086

NIBE™ F2300
Air/water heat pump

14 kW   Part no. 064 063
20 kW   Part no. 064 064

NIBE™ Top cabinet
2060 mm
Part no.   056 177
2160 mm
Part no.   056 178
2200-2,450 mm
Part no.   056 179

NIBE™ premium solar packs for VVM 500
Vertical collectors:
P2 Part no. 057 102   **P3** Part no. 057 103
P4 Part no. 057 104   **P5** Part no. 057 105
Horizontal collectors:
PL2 Part no. 057 106   **PL3** Part no. 057 107
PL4 Part no. 057 108   **PL5** Part no. 057 109

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