Indoor module NIBE VVM 500

The NIBE VVM 500 is designed for combination with any NIBE air/water heat pump to create a highly-efficient, flexible climate system for your home.

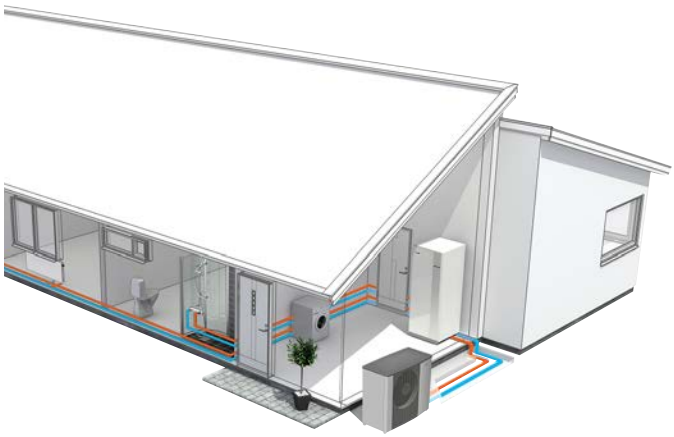
The NIBE VVM 500 has a smart, user-friendly control system which provides efficient heating/cooling and hot water with high performance. Installation of the NIBE VVM 500 is very simple since the water heater, electric additional heat and self-regulating circulation pumps are included.

Thanks to smart technology, the product gives you control over your energy consumption and will be a key part of your connected home. The efficient control system automatically adjusts the indoor climate for maximum comfort, and you do nature a favour at the same time.

- Combine with a NIBE air/water heat pump for an integrated system.
- Smart, user-friendly control system.
- Part of your smart home – control your comfort online using NIBE Uplink.

This is how NIBE VVM 500 works

Installation method



VVM 500 consists of a hot water coil, immersion heater, circulation pumps, buffer vessel, control system and is prepared for use with solar panels.

VVM 500 is directly adapted for connection and communication with NIBE air/water heat pump, which together constitute a complete heating installation.

The air/water heat pump absorbs energy from the outdoor air and transforms this into heat energy for the indoor air. The indoor module distributes heat and domestic hot water.

NIBE air/water heat pump covers most of the heating and hot water requirement down to the heat pump's stop temperature. If the outdoor temperature drops to a level below the heat pump's stop temperature, all heating is then provided using NIBE VVM 500.

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

A system with VVM 500 and NIBE's compatible air/water heat pumps allows a complete, energy-saving installation. VVM 500 can be supplemented with several different accessories.

OUTDOOR MODULES

Compatible air/water heat pumps

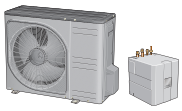
F2120

F2120-8 1x230V	*F2120-8 3x400V*
Part no. 064 134	Part no. 064 135
F2120-12 1x230V	*F2120-12 3x400V*
Part no. 064 136	Part no. 064 137
F2120-16 3x400V	*F2120-20 3x400V*
Part no. 064 139	Part no. 064 141

F2040

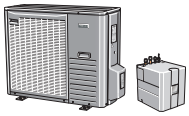
F2040-6	*F2040-8*
Part no. 064 206	Part no. 064 109
F2040-12	*F2040-16*
Part no. 064 092	Part no. 064 108

NIBE SPLIT HBS 20



AMS 20-6	*HBS 20-6*
Part no. 064 235	Part no. 067 668

NIBE SPLIT HBS 05



AMS 10-8	*HBS 05-12*
Part no. 064 033	Part no. 067 480
AMS 10-12	*HBS 05-12*
Part no. 064 110	Part no. 067 480
AMS 10-16	*HBS 05-16*
Part no. 064 035	Part no. 067 536

Check the software version of compatible older NIBE air/water heat pumps, see section "Software version in NIBE air/water heat pump".

Design

VVM 500 is fitted with intelligent control. This makes for easy operation while always enabling the indoor module to be used as efficiently as possible. The control also manages the automatic shunt and circulation pumps. Current temperatures and set values can easily be shown on the display.

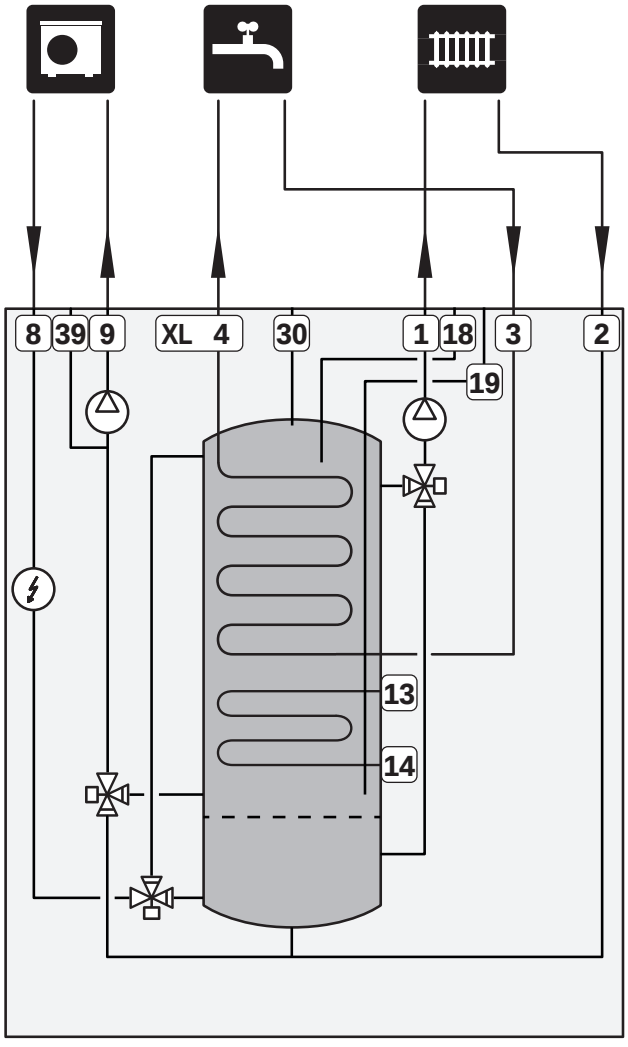
The insulation is polyurethane (PUR), which provides excellent heat insulation.

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

Principle of operation

Principle of operation with air/water heat pump, hot water and a heating system.

The heat is retrieved from the outdoor air by an air/water heat pump, where the refrigerant, which circulates in a closed system, transfers the heat from the heat source (the outdoor air) to the indoor module VVM 500.



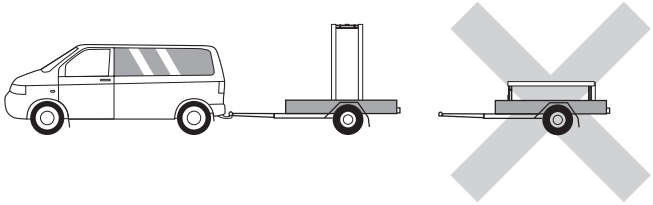
XL1	Connection, heating medium flow line
XL2	Connection, heating medium return line
XL3	Connection, cold water
XL4	Connection, hot water
XL8	Connection, docking from heat pump
XL9	Connection, docking to heat pump
XL13	Connection, solar heating system supply line
XL14	Connection, solar heating system return line
XL18	Connection, docking in high temp
XL19	Connection, docking out high temp
XL30	Connection, expansion vessel
XL39	Connection, docking pool

Good to know about VVM 500

Transport and storage

VVM 500 should be transported and stored vertically in a dry place.

However, the VVM 500 can be carefully laid on its back when being moved into a building.



Supplied components

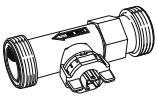
Local differences in the enclosed kit may occur. See relevant installer manual for more information.

Outside sensor

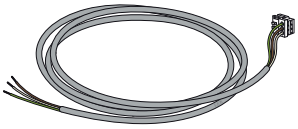
Room sensor

Current sensor

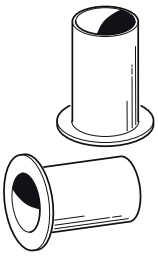
O-rings



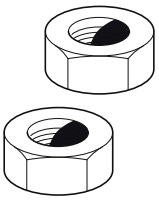
Flow meter*



Cable*



Copper pipe with flange to energy meter*



Union nut*

*Only applies to Norway.

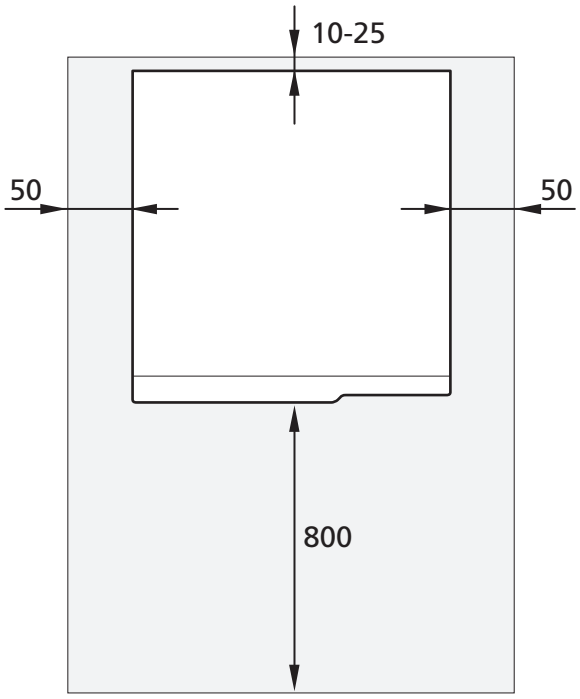
Installation and positioning

- Place VVM 500 on a solid foundation indoors that can take its weight. Use the product's adjustable feet to obtain a horizontal and stable set-up.
- The space where VVM 500 is located must be frost-free.
- Because water can exit the safety valve [1] for hot water, when connected to VVM 500, the space where VVM 500 is placed must be provided with a floor drain.

[1] Not enclosed.

INSTALLATION AREA

Leave a free space of 800 mm in front of the product. All service on VVM 500 can be carried out from the front.



Leave 10 – 25 mm free space between VVM 500 and the wall behind for routing cables and pipes.

Installation

Pipe installation

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

EQUIPMENT

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

EXPANSION VESSEL

Dimensioned as 5 % of the maximum system volume (i.e. 500 litres plus maximum circulating volume in the heating circuit). Equip the product with safety valve and expansion vessel, as these are not enclosed with the product on delivery.

WASTE WATER

Water may drip from the safety valve's overflow pipe. The entire length of the overflow water pipe must be routed to a suitable drain and be inclined to prevent water pockets, and must also be frost-proof. The overflow pipe must be at least the same size as the safety valve. The overflow pipe must be visible and its mouth must be open and not located close to electrical components.

NIBE DIM

The system requires the radiator circuit to be designed for a low temperature heating medium. At the lowest dimensioned outdoor temperature (DOT), the highest recommended temperatures are 55 °C on the supply line and 45 °C on the return line. VVM 500 can cope with up to 70 °C. For correct dimensioning of the heat pump, NIBE dimensioning program NIBE DIM is recommended.

HEATING MEDIUM

A climate system is a system that regulates indoor comfort with the help of the control system in VVM 500 and for example radiators, underfloor heating/cooling, fan convectors etc.

- Install expansion vessel and pressure gauge (BP5) in connection XL30.
- Install safety valve. The recommended opening pressure is 0.25 MPa (2.5 bar). For information about max. opening pressure, see the technical specifications.
- Install shut off valves (installed as close to VVM 500 as possible.
- When connecting to a system with thermostats on all radiators (or underfloor heating coils), either a bypass valve must be fitted or some of the thermostats must be removed to ensure there is sufficient flow.

COLD AND HOT WATER

A mixer valve must also be installed, if the factory setting for hot water is changed. National regulations must be observed.

Ensure that incoming water is clean. When using a private well, it may be necessary to supplement with an extra water filter.

For more information see nibe.eu.

INSTALLATION ALTERNATIVE

VVM 500 can be connected in several ways. The necessary safety equipment must be installed in accordance with current regulations for all installation options.

See nibe.eu for more detailed installation options.

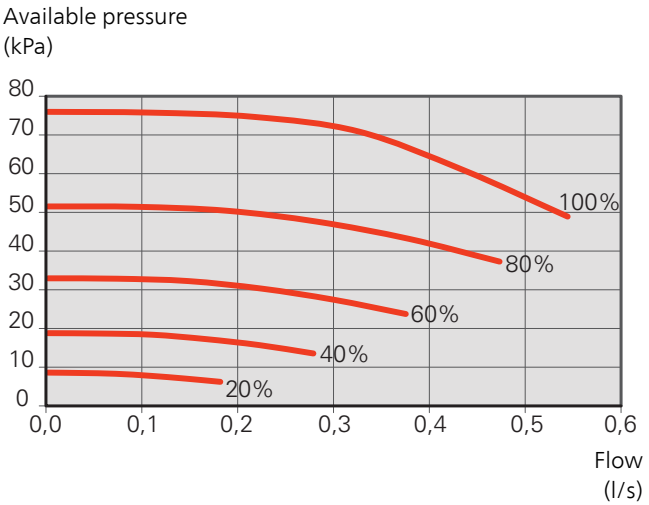
SOFTWARE VERSION IN NIBE AIR/WATER HEAT PUMP

Compatible NIBE air/water heat pump must be equipped with a control board with a display with the minimum software version indicated in the following list. The version of the control board is displayed in the heat pump's display (if applicable) at start-up.

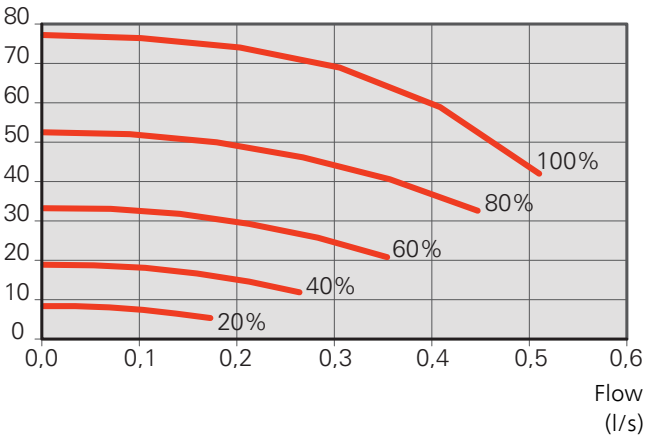
Product	*Software version*
F2020	118
F2025	55
F2026	55
F2030	all versions
F2040	all versions
F2120	all versions
F2300	55
NIBE SPLIT HBS 05: AMS 10-6 + HBS 05-6 AMS 10-8 + HBS 05-12 AMS 10-12 + HBS 05-12 AMS 10-16 + HBS 05-16	all versions

PUMP CAPACITY DIAGRAM

Available pressure circulation pump, GP1



Available pressure, charge pump, GP12



PIPE DIMENSIONS AND SYSTEM FLOWS

The pipe dimension should not be less than the recommended pipe diameter according to the table. However, each system must be dimensioned individually to manage the recommended system flows.

Minimum system flows

The installation must be dimensioned at least to manage the minimum defrosting flow at 100% pump operation, see table.

Air/water heat pump	*Minimum flow during defrosting (100% pump speed (l/s)*	*Minimum recommended pipe dimension (DN)*	*Minimum recommended pipe dimension (mm)*
F2120-8 (1x230V)	0.27	20	22
F2120-8	0.27	20	22
F2120-12 (1x230V)	0.35	25	28
F2120-12	0.35	25	28
F2120-16	0.38	25	28
F2120-20	0.48	32	35

Air/water heat pump	*Minimum flow during defrosting (100% pump speed (l/s)*	*Minimum recommended pipe dimension (DN)*	*Minimum recommended pipe dimension (mm)*
F2040-6	0.19	20	22
F2040-8	0.19	20	22
F2040-12	0.29	20	22
F2040-16	0.39	25	28

Air/water heat pump	*Minimum flow during defrosting (100% pump speed (l/s)*	*Minimum recommended pipe dimension (DN)*	*Minimum recommended pipe dimension (mm)*
HBS 20-6/ AMS 20-6	0.19	20	22
HBS 05-12/ AMS 10-8	0.19	20	22
HBS 05-12/ AMS 10-12	0.29	20	22
HBS 05-16/ AMS 10-16	0.39	25	28

An undersized system can result in damage to the machine and lead to malfunctions.

Electrical installation

ELECTRICAL CONNECTIONS

Electrical installation and service must be carried out under the supervision of a qualified electrician. Cut the current with the circuit breaker before carrying out any servicing. Electrical installation and wiring must be carried out in accordance with the stipulations in force.

General

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

- Disconnect the indoor module before insulation testing the house wiring.
- If the building is equipped with an earth-fault breaker, VVM 500 should be equipped with a separate one.
- The electrical wiring diagram for the indoor module can be found in the Installer manual.
- A screened three-core cable is used as the communication cable.
- 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, for example EKKX or LiYY or equivalent.

Power connection

VVM 500 ska installeras med frånkopplingsmöjlighet på matarledningen. Minsta kabelarea ska vara dimensionerad efter vilken avsäkring som används. Medlevererad kabel (längd ca 2 m) för inkommande el är ansluten till plint X1 på elpatronskortet. Alla installationer ska utföras enligt gällande regler. Anslutningskabeln hittar du på baksidan av VVM 500.

Miniature circuit-breaker

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

Temperature limiter

The temperature limiter cuts the power supply to the electric additional heat, if the temperature rises to between 90 and 100 °C and it is reset manually.

SETTINGS

Electric additional heat – maximum output

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

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

Emergency mode

When the indoor module's switch is set to emergency mode, only the most essential functions are activated.

- The hot water capacity is reduced.
- The load monitor is not connected.
- Fixed temperature in the supply line.

Maintenance of VVM 500

Regular checks

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.

If anything abnormal occurs, messages about the malfunction appear in the display in the form of various alarm texts.

Functions

Control, general

The indoor temperature depends on several different factors. Sunlight and heat emissions from people and household machines are normally sufficient to keep the house warm during the warm seasons. When it gets colder outside, the climate system needs to help heat the house. The colder it is outside, the warmer radiators and underfloor heating systems have to be.

Control of the heat production is performed based on the "floating condensing" principle, which means that the temperature level needed for heating at a specific outdoor temperature is produced based on collected values from the outdoor and supply temperature sensors. The room sensor can also be used to compensate the deviation in room temperature.

Heat production

The supply of heat to the house is regulated in accordance with the heating curve setting selected. After adjustment, the correct amount of heat for the current outdoor temperature is supplied. The supply temperature of the heat pump will oscillate around the theoretically required value.

OWN CURVE

VVM 500 has pre-programmed non-linear heating curves. It is also possible to create your own defined curve. This is an individual linear curve with a number of break points. You select break points and the associated temperatures.

Hot water production

Hot water charging starts when the temperature has fallen to the set start temperature. Hot water charging stops when the hot water temperature at the hot water sensor has been reached.

For temporary higher hot water demand, there is a function that allows the temperature to be raised temporarily for up to 12 hours or by a one time increase (can be selected in the menu system).

With the Smart Control function activated, VVM 500 learns how much hot water is used and when. The Smart Control function memorises the previous week's hot water consumption and adapts the hot water temperature for the coming week to ensure minimal energy consumption.

It is also possible to set VVM 500 in holiday mode, which means that the lowest possible temperature is achieved without the risk of freezing.

Additional heat only

ADDITIONAL HEAT ONLY

VVM 500 can be used with additional heat only (electric boiler) to produce heating and hot water, for example before the outdoor module is installed.

Alarm indications

The status lamp lights red in the event of an alarm and the display shows detailed information depending on the fault. An alarm log is created with each alarm containing a number of temperatures, times and operating status.

The display

VVM 500 is controlled using a clear and easy to use display.

Instructions, settings and operational information are shown on the display. You can easily navigate between the different menus and options to set the comfort or obtain the information you require.

The display unit is equipped with a USB socket that can be used to update the software and save logged information in VVM 500.

Visit nibeuplink.com and click the "Software" tab to download the latest software for your installation.

NIBE Uplink

Using the Internet and NIBE Uplink, you can obtain a quick overview and the present status of the installation and the heating in your home. You can obtain a good overall view, allowing you to monitor and control the heating and hot water comfort effectively. If the system is affected by a malfunction, you receive an alert via e-mail that allows you to react quickly.

NIBE Uplink also gives you the opportunity to control the comfort in your home easily, no matter where you are.

RANGE OF SERVICES

You have access to different levels of service via NIBE Uplink. A basic level that is free and a premium level where you can select different extended service functions for a fixed annual subscription fee (the subscription fee varies depending on the selected functions).

NIBE Uplink also available as an app from App Store and Google Play.

INSTALLATION AND ASSOCIATED EQUIPMENT REQUIREMENTS

NIBE Uplink needs the following in order to communicate with your VVM 500:

- network cable
- Internet connection to which VVM 500 can be connected
- web browser with JavaScript activated
- account on nibeuplink.com

We recommend our mobile app for NIBE Uplink.

For more information, visit nibeuplink.com.

NIBE SMART PRICE ADAPTION™

Smart Price Adaption is not available in all countries. Contact your NIBE dealer for more information.

Smart Price Adaption adjusts the heat pump's consumption according to the time of day that electricity prices are lowest. This allows for savings, provided that the hourly rate subscription has been signed with the electricity supplier.

The function is based on hourly rates for the coming day being downloaded via NIBE Uplink. To use the function, an Internet connection and account on NIBE Uplink are necessary.

SMART HOME

When you have a smart home system that can communicate with NIBE Uplink, you can control the installation via an app by activating the "smart home" function.

By allowing connected units to communicate with NIBE Uplink, your heating system becomes a natural part of your homesmart home and gives you the opportunity to optimise the operation.

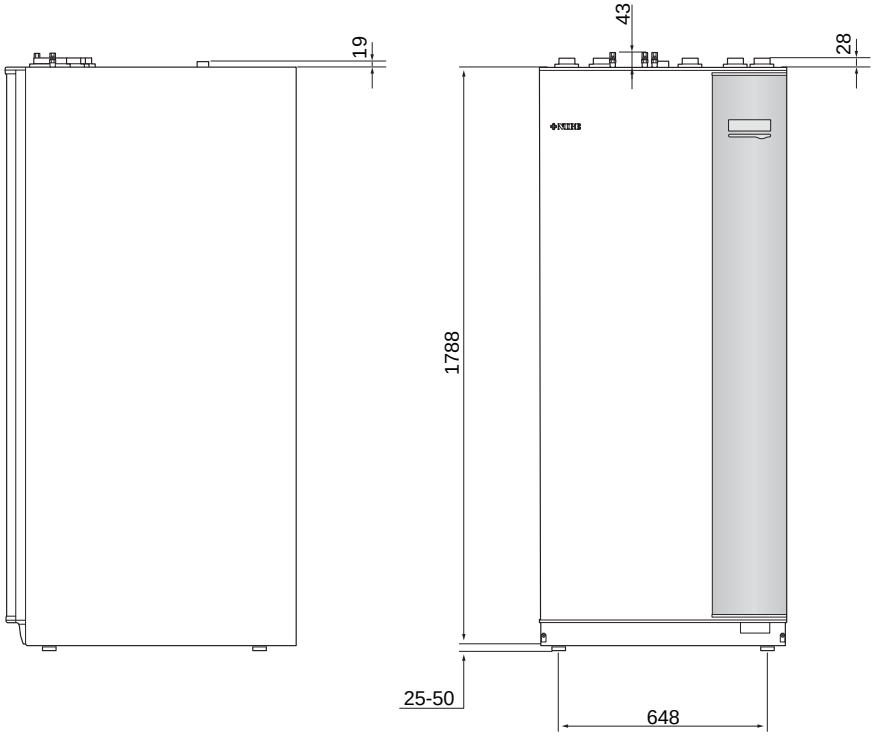
Remember that the “smart home” function requires NIBE Uplink in order to work.

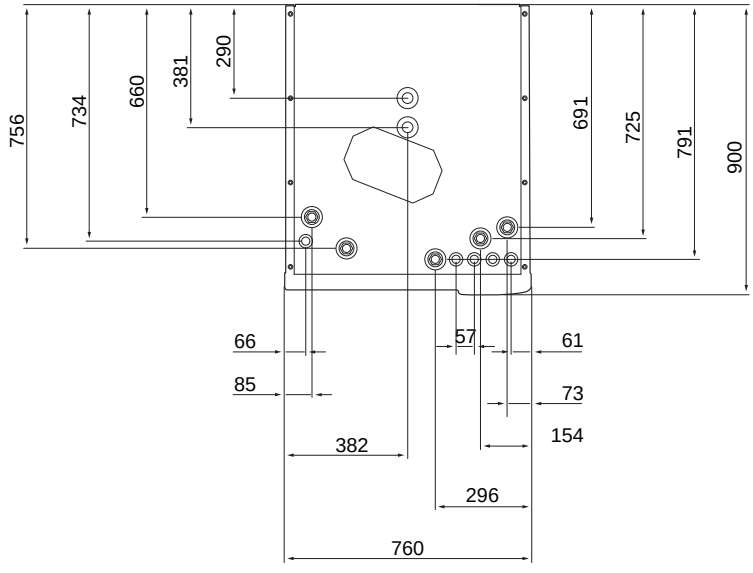
NIBE SMART ENERGY SOURCE™

Smart Energy Source™ prioritises how / to what extent each docked energy source will be used. Here you can choose if the system is to use the energy source that is cheapest at the time. You can also choose if the system is to use the energy source that is most carbon neutral at the time.

Technical data

Dimensions and setting-out coordinates





Technical specifications

3 x 400 V		
Compatible NIBE air/water heat pumps		
F2040		6 / 8 / 12 / 16
F2120		8 / 12 / 16 / 20
NIBE SPLIT HBS 05 (AMS 10 + HBS 05)		6 / 8 / 12 / 16
Electrical data		
Additional power	kW	9
Rated voltage		400 V 3N~50 Hz
Max operating current	A	16.2
Fuse	A	16
Output, Heating medium pump	W	3 – 76
Output, charge pump	W	3 – 76
Enclosure class		-
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	int.
Hot water connection	G25	ext.
Cold water connection	G25	int.
Heat pump connections	G25	int.

Miscellaneous		
Indoor module		
Volume hot water coil	l	22.8
Volume, total indoor module	l	500
Volume buffer vessel	l	80
Volume, solar coil	l	2
Cut-off pressure, hot water coil	MPa	1.0 (10 bar)
Max permitted pressure in indoor module	MPa	0.3 (3 bar)
Capacity hot water heating According to EN 16147		
Amount of hot water (40 °C)*	litre	390
Dimensions and weight		
Width	mm	760
Depth	mm	900
Height	mm	1,900
Required ceiling height	mm	2,000
Weight (excl packaging)	kg	240
Substances according to Directive (EG) no. 1907/2006, article 33 (Reach)		Lead in brass components
Part no.		069 400

*Applies in the case of normal comfort mode, tap flow 8 litres/minute and incoming cold water 10 °C. Increased hot water comfort can be obtained at lower tap flow.

Accessories

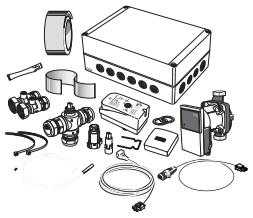
Detailed information about the accessories and complete accessories list available at nibe.eu.

Not all accessories are available on all markets.

*Active cooling ACS 310**

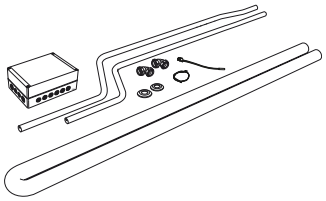
ACS 310 is an accessory that enables VVM 500 to control the production of cooling.

*The accessory requires that NIBE air/water heat pump is installed.

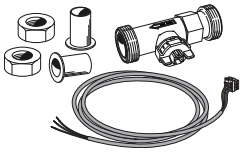


Docking kit SCA 30

SCA 30 means that VVM 500 can be connected to thermal solar heating.



Energy measurement kit EMK 500

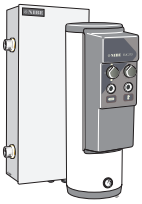


This accessory is installed externally and used to measure the amount of energy that is supplied for the pool, hot water, heating and cooling in the building.

External electric additional heat ELK

These accessories require accessory DEH 500 (step controlled addition).

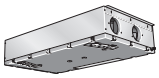
ELK 15	*ELK 213*
15 kW, 3 x 400 V	7–13 kW, 3 x 400 V



Extra shunt group ECS 40/ECS 41

This accessory is used when VVM 500 is installed in houses with two or more different heating systems that require different supply temperatures.

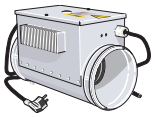
HRV unit ERS



This accessory is used to supply the accommodation with energy that has been recovered from the ventilation air. The unit ventilates the house and heats the supply air as necessary.

ERS 20-250

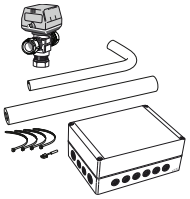
Electric air heater EAH



In cold weather, EAH heats the incoming outdoor air slightly to prevent the condensation in ERS from freezing. Used mainly in colder climates.

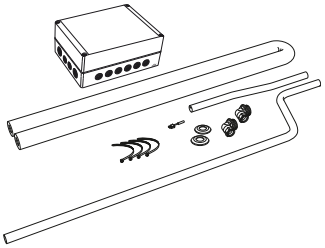
Pool heating POOL 500

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



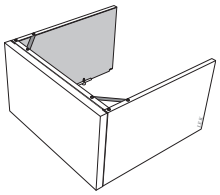
Pipe for external heat source

DEH 500 (oil/electricity/gas)



Top cabinet TOC 500

Top cabinet, which conceals any pipes/ventilation ducts.



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