

Outline principle

VVM 310 docked with heat pump, additional heat and accessory (liquid condensation)

Application

Houses with water-borne heating systems.
Maximal recommended heating output
13.5 kW.

Alternative

NOTE! This is an outline diagram. Actual installation must be project planned according to applicable norms.

NOTE! NIBE does not supply all components in this outline diagram.

See the appropriate "Installer manual"/"Installation and Maintenance Instructions" for more information.

Designations according to standard IEC 81346-1 and 81346-2.



Function

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Operate modes

Heat production

The heating control system on VVM 310 is controlled by the outdoor temperature. This means that the supply of heat to the house is regulated in accordance with the chosen setting of the regulating curve (curve slope and offset). After adjustment, the correct amount of heat for the outdoor temperature is supplied. The supply temperature of VVM 310 will hover around the required value. For subnormal temperatures the control system calculates a heating deficit in the form of "degree minutes", which means that heating production is accelerated. The larger the subnormal temperature, the greater the heat production. The internal immersion heater is connected automatically when the energy requirement exceeds the heat pump's capacity.

Hot water production

When there is a demand for hot water, VVM 310 gives this priority and devotes entire heat pump output to water heating. No room heat is produced in this mode. Maximum time for hot water charging can be adjusted in the menu system. Hot water charging starts when the hot water sensor has fallen to the set start temperature. Hot water charging stops when the hot water temperature on the hot water sensor (BT6) has been reached. For occasional higher demand for hot water, the "temporary lux" function can be used to raise the temperature for 3 – 12 hours (selected in the menu system). Periodic hot water increase is factory set to every 14 days.

Cooling production

If a heat pump with cooling function is connected to VVM 310, active cooling can be produced on two different levels.

In the lower section of VVM310 high temperature cooling down to a min temperature of +18°C can be produced.

By connecting the accessory ACS 310 supply temperatures down to +7°C can be obtained. A cooling system is connected to the heat pump supply via a reversing valve.

Functions/accessories

Heat pump

F2030 is a heat pump with on/off compressor. The entire compressor output is routed to heating, hot water or any pool heating. If the output is not sufficient, additional heat engages automatically.

F2040 is a heat pump with inverter compressor. The compressor output is adjusted according to the demand and routed to heating, hot water or any pool heating or cooling. If the heating output is not sufficient, additional heat engages automatically.

AUX inputs

VVM 310 has software controlled inputs for connecting the switch function or sensor. This means that when an external switch function or sensor is connected to one of five AUX connections, the correct function must be selected for the correct connection. For further information see the Installer's manual.

The following functions can be controlled:

- Blocking of additional heat and/or compressor
- Tariff blocking
- Activating temporary lux (extra hot water)
- External adjustment of the supply temperature
- Switch for "SG ready"

All control signals should occur with potential-free relays.

AUX outputs

It is possible to have an external connection through the relay function via a potential-free variable relay (max 2 A) on the input circuit board (AA3), terminal block X7.

Optional functions for external connection:

- Indication of common alarm (preselected at the factory).
- Cooling mode indication (only applies if cooling accessories are available).
- Control of circulation pump for hot water circulation.
- External circulation pump (for heating medium).
- Electric heater, backup

If any of the above is installed to terminal block X7 it must be selected in the control system.

The accessory card is required if two or more of the above functions are to be connected to terminal block X5 at the same time.

Room control

VVM 310 can be supplemented with a room sensor (BT50).

The room sensor has up to three functions:

- Show current room temperature in the heat pump's display.
- Option of changing the room temperature in °C.
- Makes it possible to change/stabilise the room temperature.

Install the sensor in a neutral position where the set temperature is required. A suitable place is on a free inner wall in a hall approx. 1.5 m above the floor. It is important that the sensor is not prevented from measuring the correct room temperature by being located, for example, in a recess, between shelves, behind a curtain, above or close to a heat source, in a draft from an external door or in direct sunlight. Closed radiator thermostats can also cause problems.

The heat pump operates without the sensor, but if you want to read off the accommodation's indoor temperature in the VVM 310 display, the sensor must be installed.

Electric heater backup

An electric heater can be activated by the AUX output when the compressor is stopped by a cold outdoor temperature. Maximal recommended power 4.5 kW.

Extra climate system

This function requires accessory ECS 40/ECS 41. A shunt valve, supply and return line sensor and a circulation pump are connected to a second heating circuit with a lower temperature demand (e.g. under floor heating system). The temperature in the extra climate system is controlled by the heat pump and the shunt valve by offsetting the heating curve (each climate system has its own heating curve), room sensor or room unit. Up to 3 extra climate systems can be connected to VVM 310.

Pool

This function requires accessory POOL 310. A reversing valve and a circulation pump can be connected to control all of the charge flow from the heat pump to a pool exchanger.

The reversing valve is installed on the charging circuit after the heat pump. During pool heating the heating medium is circulated between the heat pump and the pool exchanger using circulation pump GP14.

Active cooling (4-pipe)

This function requires accessory ACS 310 and heat pump with cooling function. The cooling system is connected to the heat pump charge circuit via a reversing valve and a circulation pump is connected to control all of the charge flow from the heat pump to the cooling system.

When cooling is required (activated from the outdoor sensor and any room sensor) the reversing valve and the circulation pump are activated.

The compressor output is adjusted according to the demand and to maintain the set cooling supply temperature.

External additional heat

This function requires accessory DEH 310. This accessory makes external additional heat possible in three different ways, the selection is made in the controls.

Gas/oil fired boiler:

A circulation pump is activated when the temperature of the boiler sensor has exceeded the temperature set in VVM 310. The heat is shunted to the requested temperature using the internal shunt.

Electric heater:

When the degree minute deficit is below the set value, a circulation pump is activated and the electric heater steps in as needed.

Prioritised additional heat:

A circulation pump is activated when the temperature of the boiler sensor has exceeded the temperature set in VVM 310. The heat is shunted by the internal shunt, and the heating demand for the heat pump stops.

Solar

This function requires accessory SCA 35 as well as a pump station and is suitable for installations with up to 6 m² of solar panels. The solar panel can be used to heat the accommodation and/or hot water.

List of Components

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Pos	Name	Product name	Supplier	Art no.	Remarks
EB101	Heat pump system				
EB101	Heat pump	F2030/F2040	NIBE		
FL10	Safety valve, heat pump				
HQ1	Particle filter	Included in F2XX	NIBE		
QM1	Drain valve, heating medium				
QM40-41	Shut-off valve				
QN50	Control valve				
CL11	Pool system POOL 310			067 247	
AA5	Accessory card	Included in POOL 310	NIBE		
BT51	Temperature sensor, pool	Included in POOL 310	NIBE		
EP5	Exchanger, pool				
GP9	Circulation pump				
GP12	Circulation pump	Included in POOL 310			
HQ4	Particle filter pool				
QN19	Reversing valve, pool	Included in POOL 310	NIBE	067 247	
RM5	Non-return valve				Only used when connecting solar to pool
EB1	Electric boiler system				
AA5	Control unit	Included in DEH 310	NIBE	067 249	
EB1	Electric boiler	ELK 15	NIBE	069 022	
GP15	Charge pump, external heat source				
EB2	Electric heater system				
EB2	Electric heater	ELK 15	NIBE	069 022	
EB15	Indoor module system				
EB15	Indoor module	VVM 310	NIBE	069 430	
FL2	Safety valve, heating medium				
CM1	Expansion vessel, heating medium				
EM1	External addition				
AA5	Control unit	Included in DEH 310	NIBE		
BT52	Temperature sensor, boiler	Included in DEH 310	NIBE		
EM1	Oil, gas, pellets or wood boiler				
GP15	Charge pump, external heat source				
EM2	Water jacketed stove				
AA25	Control unit	Included in SCA 35	NIBE	067 179	
BT53	Temperature sensor, solar	Included in SCA 35	NIBE	067 179	
CM5	Expansion vessel				
EM2	Water jacketed stove				

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Pos	Name	Product name	Supplier	Art no.	Remarks
EP21	Climate system 2				
AA5	Control unit	Included in ECS 40/ECS 41	NIBE	067 287/067 288	
BT2	Temperature sensor, heating medium supply	Included in ECS 40/ECS 41	NIBE	067 287/067 288	
BT3	Temperature sensor, heating medium return	Included in ECS 40/ECS 41	NIBE	067 287/067 288	
GP20	Circulation pump, extra climate system	Included in ECS 40/ECS 41	NIBE	067 287/067 288	
QN11	Shunt valve	Included in ECS 40/ECS 41	NIBE	067 287/067 288	
EP30	Solar heating system				
AA25	Accessory card	Included in SCA 35	NIBE	067 179	
BT53	Temperature sensor, solar	Included in SCA 35	NIBE	067 179	
CM5	Expansion vessel				
EP8	Solar panels				
GP30	Pump station				
FL4	Safety valve, solar				
GP4	Circulation pump, solar				
QM43-45	Shut-off valve				
RM3-4	Non-return valve				
QZ1	Hot water circulation				
GP9	Circulation pump				
EQ1	Active cooling module ACS 310			067 248	
AA25	Unit box	Included in ACS 310	NIBE		
BT64	Temperature sensor, cooling, supply line	Included in ACS 310	NIBE		
CP10	Single jacket accumulator tank, cooling	Included in ACS 310	NIBE		
GP12	Charge pump	Included in ACS 310	NIBE		
GP13	Circulation pump, cooling				
QN12	Reversing valve cooling/heating	Included in ACS 310	NIBE		