

Outline principle

SMO 20 with heat pump, hot water, additional heat and accessory (floating condensation).

Application

Buildings with water-borne heating systems.

Alternative

Additional heating before QN10

Buffer vessel (UKV)

Accessories

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

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

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

Function

SMO 20 with heat pump, hot water, additional heat and accessory (floating condensation).

Basic functions

Heat production

SMO 20 is equipped with an outdoor temperature controlled heating control system. 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 to meet the house demand at the present outside temperature is supplied. For heat production, the control system calculates a heating deficit in the form of "degree-minutes" which means that the engagement of heating production is accelerated the larger the subnormal temperature in question. To obtain a system that compensates faster the supplied room sensor should be installed.

Hot water production

During hot water production SMO 20 goes to hot water mode. No room heat is produced in this mode. Maximum time for hot water charging can be adjusted in the menu system. After this, heating is produced for the remaining period of time before further water heating can take place.

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, there is a function called "temporary lux" that allows the temperature to be raised for 3 – 12 hours (selected in the menu system).

Heat pump

F2025/F2026/F2030/F2040/F2120/F2300 can be connected to SMO 20.

The heat pump supplies the house with heating. When the heating demand exceeds the heat pump capacity the step controlled additional heat is engaged as additional heating (connected to SMO 20).

Room control

SMO 20 can be supplemented with a room sensor (BT50).

The room temperature sensor has up to three functions:

1. Show current room temperature in the control module display.
2. Option of changing the room temperature in °C.
3. 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 obstructed 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 installation operates without the sensor, but if one wishes to read off the accommodation's indoor temperature in the SMO 20 display, the sensor must be installed.

Step controlled additional heat

Heating installations are not usually dimensioned to provide the entire heat output requirement, which is why additional output is necessary during cold days. The step controlled additional heat (if connected) is automatically switched on (in different steps) if the output is not sufficient to reach the temperature levels requested by the control computer.

SMO 20 sends 230 V control signals for the additional heating, that is signals to control external relays, contactors etc, but not to supply them with power.

External step controlled additional heat can be controlled by up to three potential free relays in the heat pump (3 step linear or 7 step binary).

Step in occurs with at least 1 minute interval and step outs with at least 3 seconds interval.

External control (AUX-input)

SMO 20 can to some degree control the installation using signals from external systems (for example DUC) connected to the three software controlled inputs (AUX inputs). However, the alarm and time conditions in SMO 20 override the external control.

The following functions can be controlled:

- Blocking the compressor in heat pump
- Blocking additional heat
- Blocking heating
- Tariff blocking
- Activating temporary lux (extra hot water)
- External adjustment of flow temperature

All control signals should occur with potential-free relays.

Software controlled output (AUX output)

It is possible to have an external connection through the relay function via a potential free variable relay (max 2 A) on the terminal block AA2-X4.

Optional functions for external connection:

- Indication of buzzer alarm (preselected at the factory).
- Control of circulation pump for hot water circulation.

If any of the above is installed to terminal block AA2:X4 it must be selected in the control system.

Extended functions

Hot water circulation (VVC)

One pump can be controlled for the circulation of the hot water during selectable periods.

Boiler/electrical addition

If the indoor module does not manage to maintain the correct supply temperature the additional heat and SMO 20 are started. The additional heat is stepped in so that the actual supply temperature corresponds with the theoretically calculated set point value for the control system. When the heating demand drops sufficiently so the additional heating is no longer required one additional heat step is closed at a time.

List of Components

SMO 20 with heat pump, hot water, additional heat and accessory (floating condensation).

Pos	Name	Specification	Manufacturer	Part no.	Remarks
AA25	Control module	SMO 20	NIBE	067 224	
BT1	Outdoor sensor				Included in SMO 20
BT6	Temperature sensor, hot water charging				Included in SMO 20
BT7	Temperature sensor, hot water top				Included in SMO 20
BT25	Temperature sensor, external flow line				Included in SMO 20
BT50	Room sensor	RTS 40	NIBE	067 065	
BT63	Temperature sensor, external supply line after "additional heating before QN10"		NIBE		Included in SMO 20
BT71	Temperature sensor, external return line				Included in SMO 20
GP10	Circulation pump, heating medium				
QN10	Reversing valve, hot water/heating medium	VST 11/VST 20	NIBE	089 152 / 089 388	
EB1	Additional heat				
EB1	Immersion heater	ELK 15/ELK 26/ELK 42	NIBE	069 022/ 067 074/ 067 075	
KA1	Auxiliary relay/Contactor	HR 10	NIBE	067 309	
EB20	Immersion heater				
EB20	Immersion heater	IU (immersion heater) + K11 (terminal block)	NIBE	IU 3kW: 018 084 IU 6kW: 018 088 IU 9kW: 018 090 K11: 018 893	
KA1	Auxiliary relay/Contactor	HR 10	NIBE	067 309	
EB101	Heat pump system				
BT3	Temperature sensor, return				Included in F2025/F2026//F2030/F2040/F2120/F2300
BT12	Temperature sensor, condenser supply line				Included in F2025/F2026//F2030/F2040/F2120/F2300
EB101	Heat pump	F2025/F2026//F2030/F2040/F2120/F2300	NIBE		F2025/F2026/F2300: The software must be 55 or later.
GP12	Charge pump	CPD 10	NIBE	(CPD 10-25/55: 067 305 CPD 10-25/60: 067 306	
HQ1	Particle filter		NIBE		Included in F2025/F2026//F2030/F2040/F2120/F2300
QM1	Drain valve, heating medium				
QM31-32, QM43	Shut-off valve				
RN10	Trim valve				
EM1	External addition				Certain boilers have their own circulation pumps, if not they must be equipped with a flow guard.
EM1	Oil, gas, pellets or wood boiler				
KA1	Auxiliary relay/Contactor	HR 10	NIBE	067 309	
RM3	Non-return valve				

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QZ1	Hot water circulation		
GP11	Circulation pump		
	Other information		
CM1	Expansion vessel, closed		
CP5	Buffer vessel, UKV		
CP10	Accumulator tank with hot water heating	VPA/VPB/VPAS	NIBE
EB10	Core water heater		
FL2	Safety valve, Heating medium		

Note that the tank must be able to receive the heat pump charge effect. See the last page for a table of possible combinations of NIBE's range.

System solutions

The following combinations of products are recommended for control with SMO 20.

Control module	Air/water heat pump	Accumulator with hot water heater	Circ. pump	Hot water heater	HW Control	Addition	Volume vessel
SMO 20	F2030 – 7 kW	VPA 300/200 VPA 450/300 VPAS 300/450	CPD 10-25/55 CPD 10-25/60	VPB 200 VPB 300 VPBS 300 VPB 500 VPB 750-2	VST 11	ELK 15 ELK 26	UKV 100 UKV 200 UKV 300 UKV 500
	F2030 – 9 kW						
	F2040/F2120 – 8 kW						
	F2040/F2120 – 12 kW						
	F2040/F2120 – 16 kW						
	F2300 – 14 kW	VPB 500 VPB 750-2 VPB 1000		VST 20 VST 11 VST 20			
	F2300 – 20 kW	VPB 750-2 VPB 1000		VST 20			