Control module
NIBE SMO S40

The NIBE SMO S40 gives optimised control of the climate system and is designed to be combined with NIBE air/water heat pumps to provide an integrated climate system for homes and properties.

The NIBE SMO S40 offers high flexibility when it comes to system solutions. The control module can be connected to components such as a water heater, additional heat sources and other accessories specific to a customised installation. Up to eight NIBE air/water heat pumps can be connected to a control system.

The NIBE S Series is a natural part of your connected home. Smart technology adjusts the indoor climate automatically while you're in complete control from your phone or tablet. Giving high comfort and low energy consumption, while doing nature a favour at the same time.

- **In combination with a NIBE air/water heat pump – a part of your energy-saving smart home.**
- **Property solutions with up to eight NIBE air/water heat pumps**
- **Smart, user-friendly system with touch control and built-in modbus TCP / IP for high flexibility.**

This is how NIBE SMO S40 works

SMO S40 can be connected together with other products from NIBE in several different ways (accessories may be required).

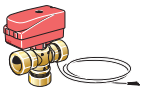
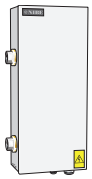
More information about the alternatives is available at nibe.eu and in the relevant assembly instructions for the accessories used.

Installations with SMO S40 can produce heating and hot water. SMO S40 can also control cooling and ventilation (accessories).

On cold days of the year, when the availability of energy from the air is lower, the additional heating can compensate and help the heat pump to produce heating / cooling. The additional heating is also good to have as assistance, if the heat pump ends up outside its working range or if it has been blocked for any reason.

System solutions

The following combinations of products are recommended for control by SMO S40.

							
Control module	*Air/water heat pump*	*HW control*	*Accumulator with hot water heater*	*Circ. pump*	*Water heater*	*Addition*	*Volume vessel*
SMO S40	AMS 10-6 / HBS 05-6	VST 05	VPA 200/70 VPA 300/200 VPA 450/300 VPAS 300/450	CPD 11-25/65	VPB 200 VPB 300 VPBS 300 VPB 500 VPB 750 VPB 1000	ELK 15 ELK 26 ELK 42 ELK 213	UKV 40 UKV 100 UKV 200 UKV 300 UKV 500
	AMS 20-6 / HBS 20-6						
	AMS 20-10 / HBS 20-10						
	F2040 – 6						
	F2040 – 8						
	F2050 – 6						
	F2050 – 10						
	F2120 – 8						
	S2125 – 8						
	AMS 10-12 / HBS 05-12	VST 11					
	F2040 – 12						
	F2120 – 12						
	S2125 – 12						
	F2120 – 16						
	AMS 10-16 / HBS 05-16	VST 20	VPA 300/200 VPA 450/300 VPAS 300/450	CPD 11-25/75	VPB 500 VPB 750 VPB 1000		UKV 200 UKV 300 UKV 500 UKV 750 UKV 1000
	F2040 – 16						
	F2120 – 20						
	F2300 – 20						

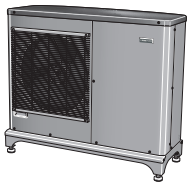
Outdoor modules

COMPATIBLE AIR/WATER HEAT PUMPS

F2040

F2040-12
Part no. 064 092

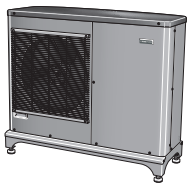
F2040-16
Part no. 064 108



F2050

F2050-6
Part no. 064 328

F2050-10
Part no. 064 318



F2120

F2120-16 3x400 V
Part no. 064 139

F2120-20 3x400 V
Part no. 064 141

S2125

S2125-8 1x230 V
Part no. 064 220

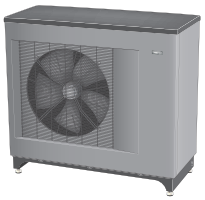
S2125-8 3x400 V
Part no. 064 219

S2125-12 1x230 V
Part no. 064 218

S2125-12 3x400 V
Part no. 064 217

F2300

F2300-20
Part no. 064 064



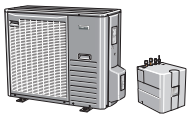
NIBE SPLIT HBS 05

AMS 10-12
Part no. 064 110

HBS 05-12
Part no. 067 480

AMS 10-16
Part no. 064 035

HBS 05-16
Part no. 067 536



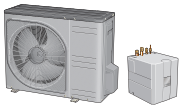
NIBE SPLIT HBS 20

AMS 20-6
Part no. 064 235

HBS 20-6
Part no. 067 668

AMS 20-10
Part no. 064 319

HBS 20-10
Part no. 067 819



System principles

This is the outline diagram. Actual installations must be planned according to applicable standards.

NIBE does not supply all the components in these outline diagrams.

CONNECTING AIR/WATER HEAT PUMP

You can find a list of compatible air/water heat pumps in section "Outdoor modules".

Also, consult the Installer Manual for your air/water heat pump.

Install as follows:

- expansion vessel
- pressure gauge
- safety valve / safety valves

  Some heat pump models have a factory-fitted safety valve.
- drain valve

  For draining the heat pump during prolonged power failures. Only for heat pumps that do not have a gas separator.
- non-return valve

  Installations with only one heat pump: a non-return valve is only required in those cases where the placement of the products in relation to each other can cause self-circulation.

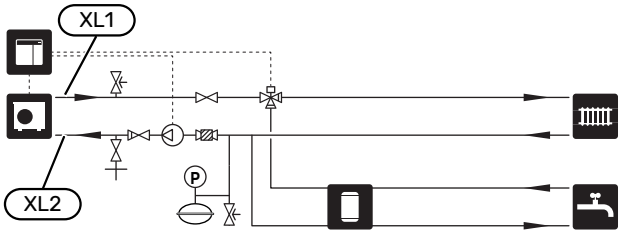
  Cascade installations: each heat pump must be fitted with a non-return valve.

  If the heat pump is already fitted with a non-return valve, there is no need to install another.
- charge pump
- shut-off valve

  To facilitate any future servicing.
- filterball or particle filter

  In installations with a particle filter, the filter is combined with an additional shut-off valve.
- reversing valve.

  If the system is to work with both a climate system and a water heater.



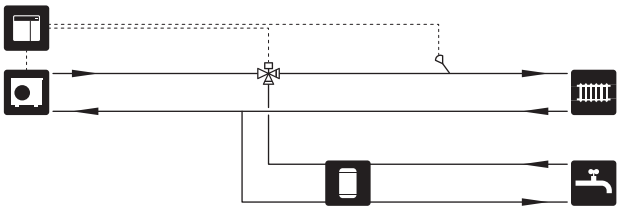
CONNECTING THE CLIMATE SYSTEM

A climate system is a system that regulates the indoor temperature with the help of the control system in SMO S40 and, for example, radiators, underfloor heating, underfloor cooling, fan coils, etc.

Connecting the climate system

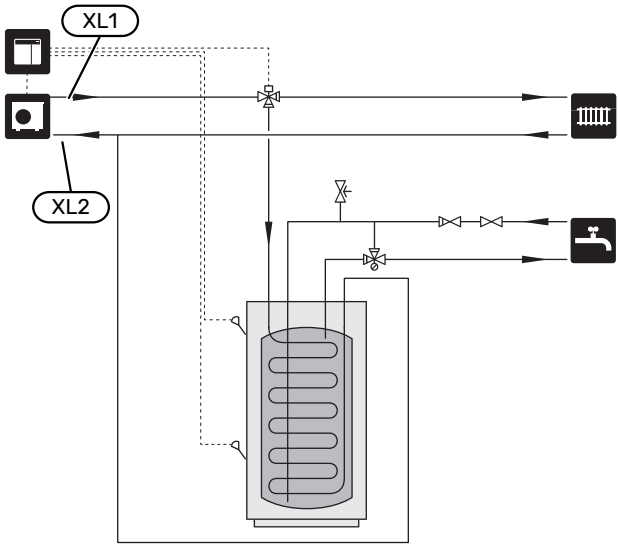
Install as follows:

- supply temperature sensor
- When connecting to systems with thermostats, some of the thermostats must be removed to ensure there is sufficient flow and heat generation.



COLD AND HOT WATER

Hot water production is activated in the start guide or in menu 7.2 - "Accessory settings".



INSTALLATION ALTERNATIVE

SMO S40 can be installed in several different ways, some of which are shown here.

More information about the alternatives is available at nibe.eu and in the relevant assembly instructions for the accessories used. See section "Accessories" for a list of the accessories that can be used with SMO S40.

Hot water circulation

A circulation pump can be controlled by SMO S40 to circulate the hot water. The circulating water must have a temperature that prevents bacterial growth and scalding, and national standards must be satisfied.

The HWC return is connected to a freestanding water heater.

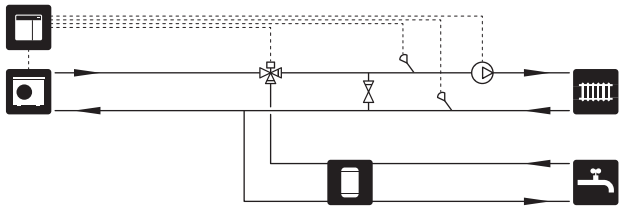
External heating medium pump

In installations where there is a large pressure drop in the system, an external heating medium pump can be used as a supplement.

The installation can also be supplied with an external heating medium pump, if you want a constant flow in the climate system.

The heating medium pump is supplemented with an external return line sensor and a non-return valve .

If the installation does not have an external supply temperature sensor , install this as well.

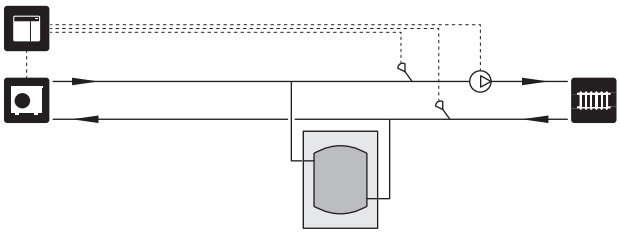


Buffer vessel (UKV)

UKV is an accumulator tank that is suitable for connection to a heat pump or another external heat source, and can have several different applications.
For further information, see the Installer Manual for the accessory.

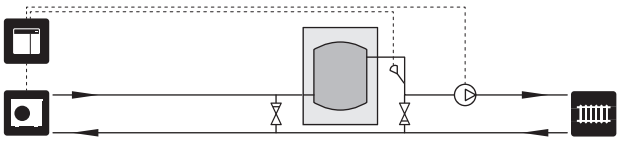
Flow equalisation

A 2-pipe, parallel-connected buffer vessel is used for high-temperature and/or low-flow systems. This connection principle requires a continuous flow over the external supply temperature sensor (BT25) and it is used as a buffer for the heat pump (volume expansion) and as a buffer for the climate system (for large, temporary power outputs such as defrosting and fan coil, etc.).



Flow equalisation

A 2-pipe-connected buffer vessel with non-return valves, external heating medium pump and external supply temperature sensor is used when the system volume in the climate system is less than the minimum recommended volume for the heat pump and it is necessary to create balance between power input and output.

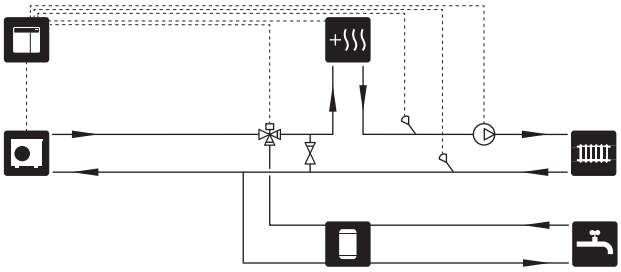


Addition

On cold days of the year, when the availability of energy from the air is lower, the additional heating can compensate and help to produce heat. The additional heating is also good to have as assistance, if the heat pump ends up outside its working range or if it has been blocked for any reason.

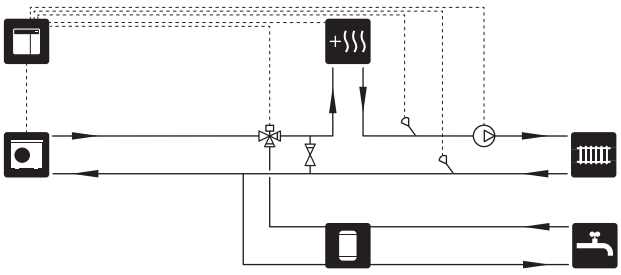
Step-controlled/shunt-controlled additional heat

SMO S40 can, via a control signal, control step-controlled or shunt-controlled additional heat, which can also be prioritised. The additional heat is used for heat production.



Step controlled additional heat

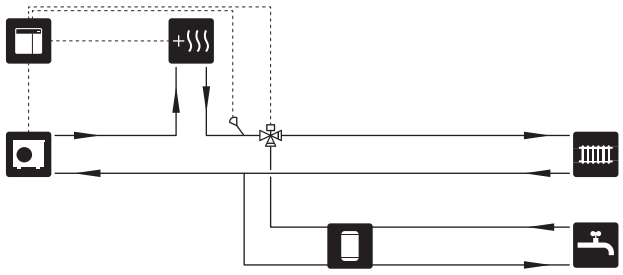
SMO S40 can control step-controlled additional heat via a control signal. The additional heat is used for heat production.



Step-controlled additional heat before QN10

The additional heat is connected before the reversing valve and is controlled via a control signal from SMO S40. The additional heat can be used for producing both hot water and heating.

The installation is supplemented with a supply temperature sensor after additional heat .

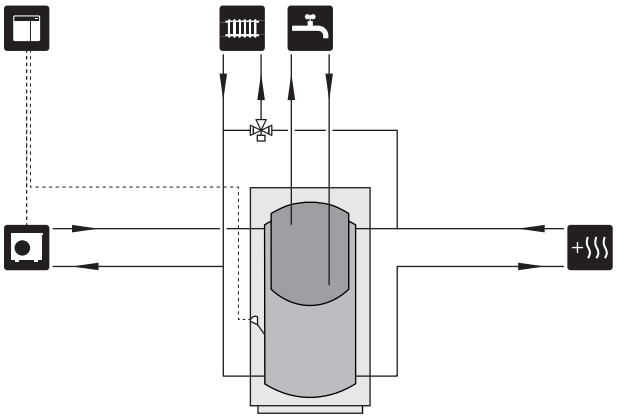


Fixed condensing

If the heat pump is to work towards an accumulator tank with fixed condensing, you must connect an external supply temperature sensor . The sensor is placed in the tank.

The following menu settings are made:

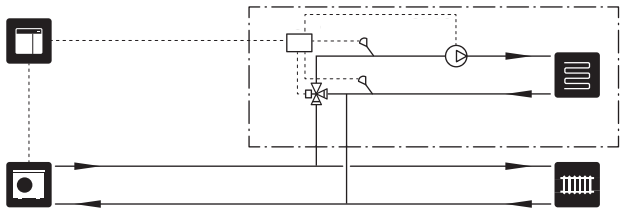
Menu	Menu setting (local variations may be required)
1.30.4 - min. flow line temp. heating	Desired temperature in the tank.
1.30.6 - max flow line temperature	Desired temperature in the tank.
7.1.2.1 - op. mod heat med pump	intermittent
4.1 - op. mode	manual



Extra climate system

In buildings with several climate systems that require different supply temperatures, the accessory ECS 40/ECS 41 can be connected.

A shunt valve then lowers the temperature to the underfloor heating system, for example.

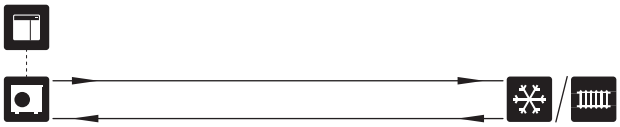


Cooling

Cooling in 2-pipe system

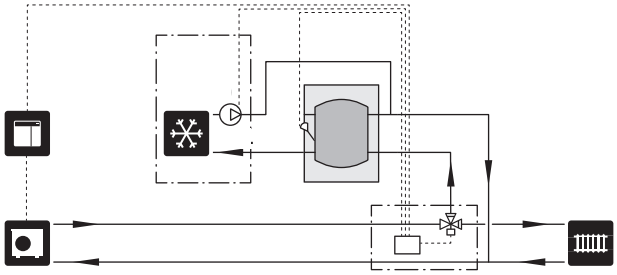
Cooling and heating are distributed via the same climate system.

When there is a risk of condensation, components and climate systems must be insulated against condensation in accordance with current standards and provisions, or the min. supply temperature must be limited.



Cooling in 4-pipe system

With the accessory AXC 30, separate cooling and heating systems can be connected via a reversing valve.



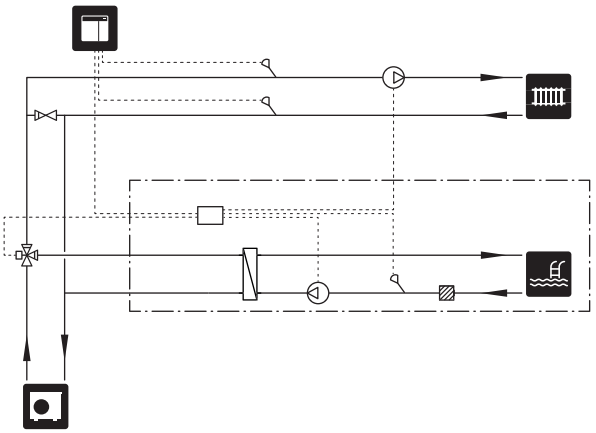
Delayed supply line for cooling

When the installation switches to cooling production e.g. from hot water production, a certain amount of heat escapes into the cooling system. To avoid this, a reversing valve is installed in the system.

Pool

With the POOL 40 accessory, you can heat the pool with your system.

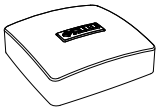
During pool heating, the heating medium circulates between the heat pump and the pool exchanger using the heat pump's charge pump.



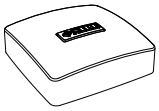
Good to know about SMO S40

Supplied components

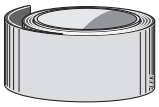
Local differences in the enclosed kit may occur. See relevant installer manual for more information.



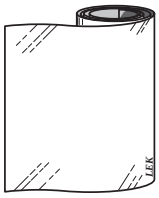
Outdoor temperature sensor



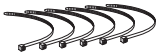
Room sensor



Insulation tape



Aluminium tape



Cable ties

Temperature sensor

Current sensor

Heating pipe paste

Installation

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 closed heating systems.

If the heat pump is replaced, the installation must be inspected again.

Pipe installation

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

MINIMUM SYSTEM FLOWS

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

Each climate system must be dimensioned individually to provide the recommended system flows.

The installation must be dimensioned to provide at least the minimum defrosting flow at 100 % circulation pump operation.

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

Air/water heat pump	Minimum flow during defrosting 100% circulation pump operation (l/s)	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
AMS 20-6/HBS 20-6	0.19	20	22
AMS 20-10/HBS 20-10			

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

Air/water heat pump	Minimum flow during defrosting 100% circulation pump operation (l/s)	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
F2050-6	0.19	20	22
F2050-10			

Air/water heat pump	Minimum flow during defrosting 100% circulation pump operation (l/s)	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
F2120-16 (3x400 V)	0.38	25	28
F2120-20 (3x400 V)	0.48	32	35

Air/water heat pump	Minimum flow during defrosting 100% circulation pump operation (l/s)	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
S2125-8 (1x230 V)	0.32	25	28
S2125-8 (3x400 V)			
S2125-12 (1x230 V)			
S2125-12 (3x400 V)			

Air/water heat pump	Minimum flow during defrosting 100% circulation pump operation (l/s)	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
F2300-20	0.47	32	35

Electrical connections

EXTERNAL CONNECTION OPTIONS

SMO S40 has software-controlled inputs and outputs for connection of sensors and external switch function.

This means that a sensor or an external switch function can be connected to one of eight special connections, where the connection's function is determined in the control module's software.

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.

Heating/cooling production

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

OWN CURVE

SMO S40 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, SMO S40 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 SMO S40 in holiday mode, which means that the lowest possible temperature is achieved without the risk of freezing.

Alarm indications

In the event of an alarm, a malfunction has occurred and the status lamp shines with a steady red light. You receive information about the alarm in the smartguide on the display.

myUplink

With myUplink you can control the installation – where and when you want. In the event of any malfunction, you receive an alarm directly to your e-mail or a push notification to the myUplink app, which allows you to take prompt action.

Visit myuplink.com for more information.

SPECIFICATION

You need the following in order for myUplink to be able to communicate with your SMO S40:

- wireless network or network cable
- Internet connection
- account on myuplink.com

We recommend our mobile apps for myUplink.

RANGE OF SERVICES

myUplink gives you access to various levels of service. The base level is included and, apart from this, you can choose two premium services for a fixed annual fee (the fee varies depending on the functions selected).

Service level	Basic	Premium extended history	Premium change settings
Viewer	X	X	X
Alarm	X	X	X
History	X	X	X
Extended history	-	X	-
Manage	-	-	X

MOBILE APPS FOR MYUPLINK

The mobile apps can be downloaded free of charge from where you usually download your mobile apps. Logging into the mobile app is performed using the same account details as on myuplink.com.

WIRELESS UPDATES

When the system is connected, there is the option to receive wireless updates. This provides the system with new functions, giving a better experience. To receive wireless updates, you have to create an account on myUplink.

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.

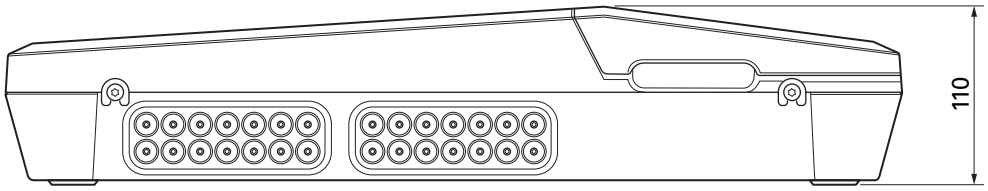
The display

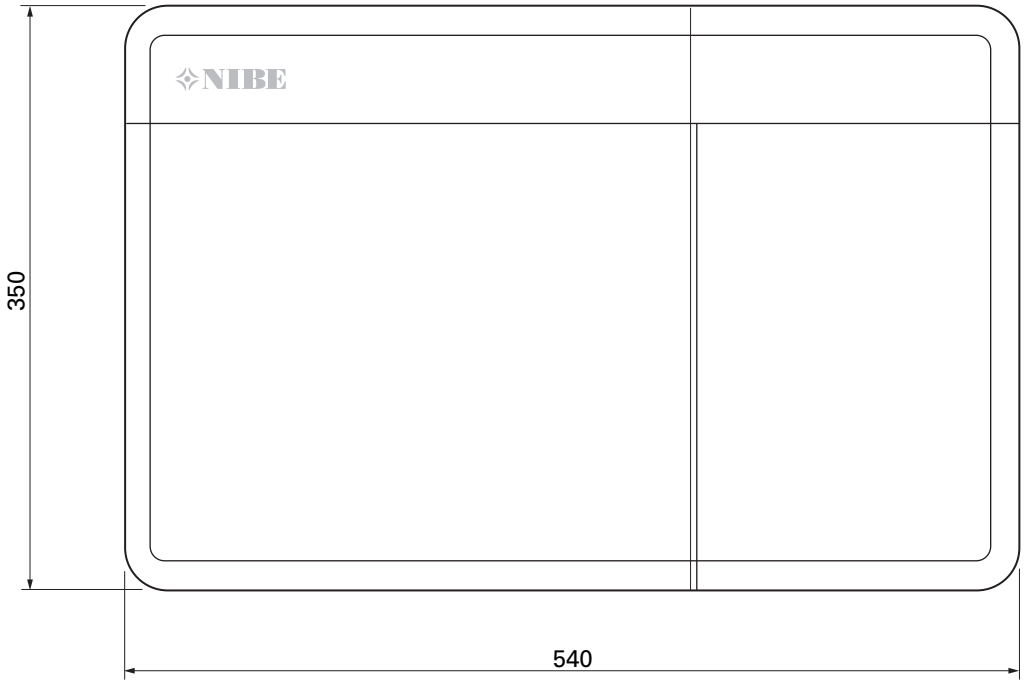
SMO S40 is controlled using a clear and easy to use display.

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.

Technical data

Dimensions





Technical specifications

SMO S40		
Electrical data		
Supply voltage		230V~ 50Hz
Enclosure class		IP21
Rated value for impulse voltage	kV	4
Pollution degree		2
Fuse	A	10
WLAN		
402.412 – 2.484 GHz max power	dbm	11
Wireless units		
2.405 – 2.480 GHz max power	dbm	4
Optional connections		
Max number air/water heat pumps		8
Max number of charge pumps		2
Max number of outputs for additional heat step		3

Miscellaneous		
Operation mode (EN60730)		Type 1
Area of operation	°C	-25 – 70
Ambient temperature	°C	5 – 35
Program cycles, hours		1, 24
Program cycles, days		1, 2, 5, 7
Resolution, program	min.	1
Miscellaneous		
Weight, (without packaging and enclosed components)	kg	5
Part no. SMO S40		067 654

Energy labelling

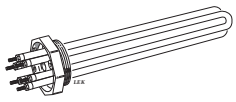
Supplier		NIBE
Model		**SMO S40 + F2040 / F2120**
Controller, class		VI
Controller, contribution to efficiency	%	4.0

Accessories

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

Not all accessories are available on all markets.

Immersion heater IU



3 kW

Part no. 018 084

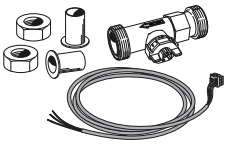
6 kW

Part no. 018 088

9 kW

Part no. 018 090

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.

Cu pipe Ø28.

Part no. 067 178

External electric additional heat ELK

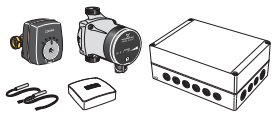
ELK 15
15 kW, 3 x 400 V
Part no. 069 022

ELK 26
26 kW, 3 x 400 V
Part no. 067 074

ELK 42
42 kW, 3 x 400 V
Part no. 067 075

ELK 213
7–13 kW, 3 x 400 V
Part no. 069 500

Extra shunt group ECS

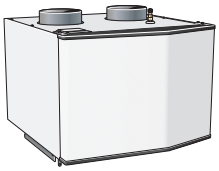


This accessory is used when SMO S40 is installed in houses with two or more different heating systems that require different supply temperatures.

ECS 40 (Max 80 m²)
Part no 067 287

ECS 41 (approx. 80-250 m²)
Part no 067 288

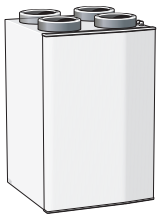
Exhaust air unit S135



S135 is an exhaust air module specially designed to combine recovery of mechanical exhaust air with an air/water heat pump. Indoor module/control module controls S135.

Part no. 066 161

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 S10-400 [1]
Part no. 066 163

ERS 20-250 [2]
Part no. 066 068

ERS 30-400 [1]
Part no. 066 165

ERS S40-350
Part no. 066 166

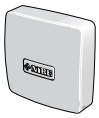
1 A preheater may be required.
2 A preheater may be required.

Auxiliary relay HR 10

Auxiliary relay HR 10 is used to control external 1 to 3 phase loads such as oil burners, immersion heaters and pumps.

Part no 067 309

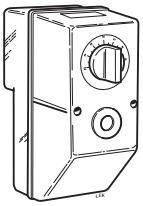
Communication module for solar electricity EME 20



EME 20 is used to enable communication and control between inverters for solar cells from NIBE and SMO S40.

Part no. 057 215

Connection box K11



Connection box with thermostat and overheating protection.
(When connecting Immersion heater IU)

Part no. 018 893

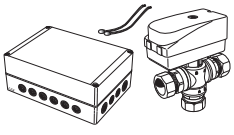
Charge pump CPD 11

Charge pump for heat pump

CPD 11-25/65
Part no. 067 321

CPD 11-25/75
Part no. 067 320

Pool heating POOL 40



POOL 40 is used to enable pool heating with SMO S40.

Part no 067 062

Room unit RMU S40

The room unit is an accessory with a built-in room sensor, which allows the control and monitoring of SMO S40 to be carried out in a different part of your home to where it is located.

Part no. 067 650

Accessory card AXC 30

An accessory board for active cooling (4-pipe system), extra climate system, hot water comfort or if more than two charge pumps are to be connected to SMO S40. It can also be used for step-controlled additional heat (e.g. external electric boiler), shunt-controlled additional heat (e.g. wood/oil/gas/pellet boiler).

An accessory board is required if for example an HWC pump is to be connected to SMO S40 at the same time that the common alarm indication is activated.

Part no. 067 304

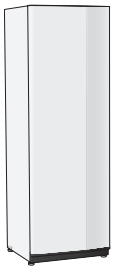
Wireless accessories

It is possible to connect wireless accessories to SMO S40, e.g. room, humidity, CO_2 sensors.

For more information, as well as a complete list of all available wireless accessories, see myuplink.com.

Water heater/Accumulator tank

AHPH S



Accumulator tank without an immersion heater with an integrated hot water coil (stainless steel corrosion protection).
Part no. 080 137

VPA

Water heater with double-jacketed vessel.

VPA 450/300

Corrosion protection:
Copper Part no. 082 030
Enamel Part no. 082 032

VPB

Water heater without immersion heater with charging coil.

VPB 500

Corrosion protection:
Copper Part no. 081 054

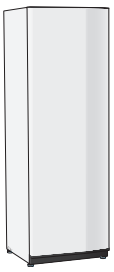
VPB 750

Corrosion protection:
Copper Part no. 081 052

VPB 1000

Corrosion protection:
Copper Part no. 081 053

VPB S



Water heater without immersion heater with charging coil.

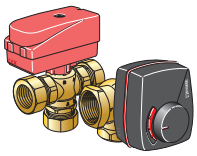
VPB S200

Corrosion protection:
Copper Part no. 081 139
Enamel Part no. 081 140
Stainless Part no. 081 141

VPB S300

Corrosion protection:
Copper Part no. 081 142
Enamel Part no. 081 144
Stainless Part no. 081 143

Hot water control



VST 05

Reversing valve, cu-pipe Ø22
(Max recommended power, 8 kW)
Part no. 089 982

VST 11

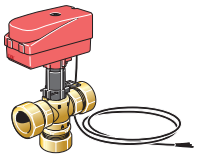
Reversing valve, cu-pipe Ø28
(Max recommended power, 17 kW)
Part no. 089 152

VST 20

Reversing valve, cu-pipe Ø35
(Max recommended power, 40 kW)
Part no 089 388

Reversing valve for cooling

VCC 11



Reversing valve, Cu pipe Ø28 mm
Part no. 067 312

Sustainable energy solutions since 1952

NIBE has been manufacturing energy-efficient and sustainable climate solutions for your home for 70 years. It all began in Markaryd, in the southern Swedish province of Småland, and we recognise our Nordic heritage by utilising the power of nature. We combine renewable energy with smart technology to offer efficient solutions, allowing us to work together to create a more sustainable future.

Regardless of whether it is a chilly winter's day or a warm afternoon in the summer sun, we need a balanced indoor climate that allows us to enjoy a comfortable life, whatever the weather. Our extensive range of products supply your home with cooling, heating, ventilation and hot water, making it possible for you to create a pleasant indoor climate with little impact on the environment.

NIBE Energy Systems
Box 14, SE-285 21 Markaryd
nibe.eu

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