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 maximum 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 maximum comfort and minimum energy consumption, while doing nature a favour at the same time.

- Smart, user-friendly system with touch control for maximum flexibility.
- Property solutions with up to eight NIBE air/water heat pumps.
- In combination with a NIBE air/water heat pump – a part of your energy-saving smart home.

This is how NIBE SMO S40 works

SMO S40 can be connected together with other products from NIBE in several different ways, some of which are shown below (accessories may be required).

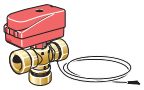
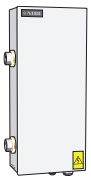
More information about the alternatives is available at nibe.eu and in the relevant assembly instructions for the accessories used.

Installations with SMO S40 can produce heating and hot water.

On cold days of the year when the access to energy from the air is reduced 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.

System solutions

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

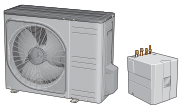
							
Control module	*Air/water heat pump*	*HW control*	*Accumulator with hot water heater*	*Circ. pump*	*Water heater*	*Addition*	*Volume vessel*
SMO S40	AMS 20-6 / HBS 20-6	VST 05	VPA 200/70 VPA 300/200 VPA 450/300 VPAS 300/450	CPD 11-25/65 CPD 11-25/75	VPB 200 VPB 300 VPBS 300 VPB 500 VPB 750-2 VPB 1000	ELK 15 ELK 26 ELK 42	UKV 40 UKV 100 UKV 200 UKV 300 UKV 500
	AMS 10-6 / HBS 05-6						
	AMS 10-8 / HBS 05-12						
	F2040 – 6						
	F2040 – 8						
	F2120 – 8						
	AMS 10-12 / HBS 05-12	VST 11					
	F2040 – 12						
	F2120 – 12						
	F2120 – 16						
	AMS 10-16 / HBS 05-16	VST 20			VPB 500 VPB 750-2 VPB 1000		
	F2040 – 16						
	F2120 – 20						

Outdoor modules

COMPATIBLE AIR/WATER HEAT PUMPS

In some air/water heat pumps, manufactured before or during 2019, the circuit board must be updated in order to be compatible with SMO S40.

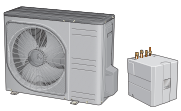
NIBE SPLIT HBS 20



AMS 20-6 Part no. 064 235

HBS 20-6 Part no. 067 668

NIBE SPLIT HBS 05



AMS 10-6 Part no. 064 205

HBS 05-6 Part no. 067 578

AMS 10-8 Part no. 064 033

HBS 05-12 Part no. 067 480

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

F2030

7 kW Part no. 064 099

9 kW Part no. 064 070

F2040

F2040-6 Part no. 064 206

F2040-8 Part no. 064 109

F2040-12 Part no. 064 092

F2120

F2120-8 1x230V Part no. 064 134

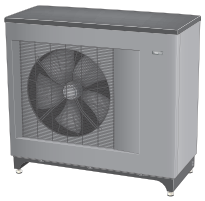
F2120-8 3x400V Part no. 064 135

F2120-12 3x400V Part no. 064 137

F2120-16 3x400V Part no. 064 139

F2120-20 3x400V Part no. 064 141

F2300



14 kW Part no. 064 063

20 kW Part no. 064 064

System principles

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

NIBE does not supply all components in this outline diagram.

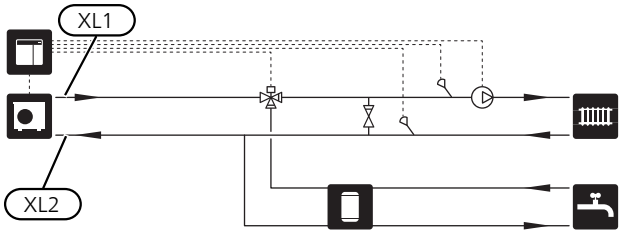
SYMBOL KEY

Symbol	*Meaning*
	Unit box
	Shut-off valve
	Tapping valve
	Non-return valve
	Mixing valve
	Circulation pump
	Expansion vessel
	Filterball
	Pressure gauge
	Particle filter
	Safety valve
	Temperature sensor
	Reversing valve/shunt
	Heat exchanger
	Overflow valve
	Under floor heating systems
	Control module
	Cooling system
	Air/water heat pump
	Pool
	Radiator system
	Domestic hot water
	Addition
	Water heater

CONNECTING THE CLIMATE SYSTEM

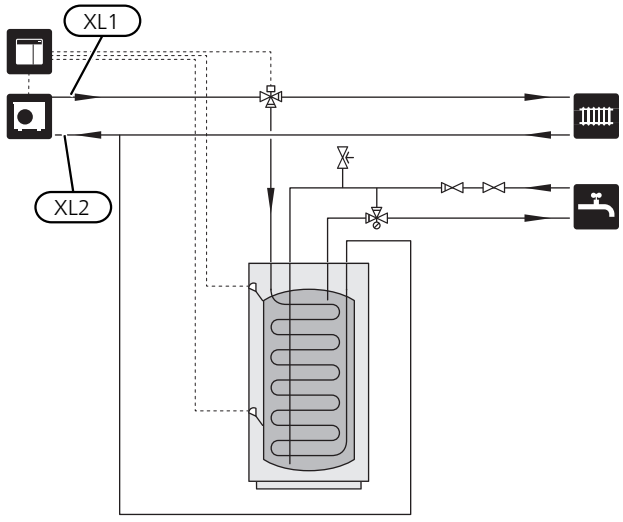
A climate system is a system that regulates indoor comfort with the help of the control system in SMO S40 and for example radiators, underfloor heating/cooling, fan convectors etc.

- Install external supply temperature sensor (BT25) It says when the air/water heat pump must start to produce heating/cooling for the climate system.
- Install external return temperature sensor (BT71). It is used to check that the climate system is correctly adjusted.
- When connecting to systems with thermostats on all radiators/underfloor heating coils, some of the thermostats must be removed to ensure there is sufficient flow.
- For an even flow to the radiators during hot water charging or similar, a circulation pump and reversing valve for the climate system are installed.



COLD AND HOT WATER

Hot water production is activated in the start guide or in menu 7.1.1.



INSTALLATION ALTERNATIVE

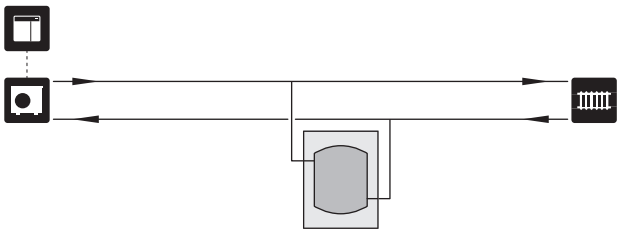
SMO S40 can be connected in several different ways, some of which are shown below.

More information about the alternatives is available at nibe.eu/ODM 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.

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. It can also be used during external control of the heating system.

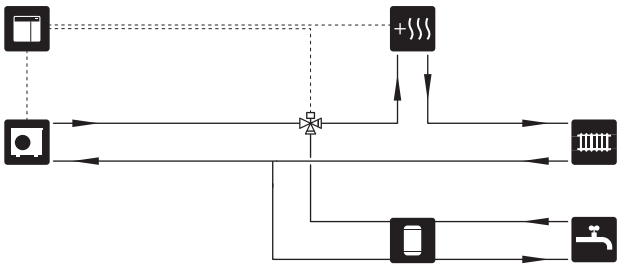
The image shows UKV flow equalisation.



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.

In the principle diagram below, the additional heat is located after the reversing valve. (Additional heat can also be connected before the reversing valve.)

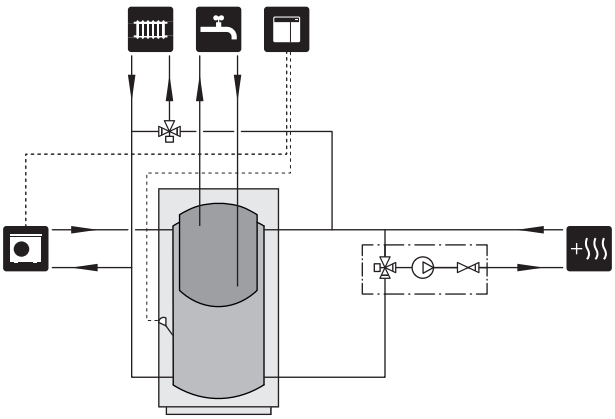


Fixed condensing

If SMO S40 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:

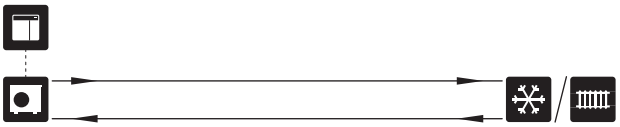
Menu	*Menu setting (local variations may be required)*
1.30.4 - min. flow line temp. heating	Desired temperature in the tank.
1.30.6 - max flow line temperature	Desired temperature in the tank.
7.1.2.1 - op. mod heat med pump	intermittent
4.1 - op. mode	manual



Cooling

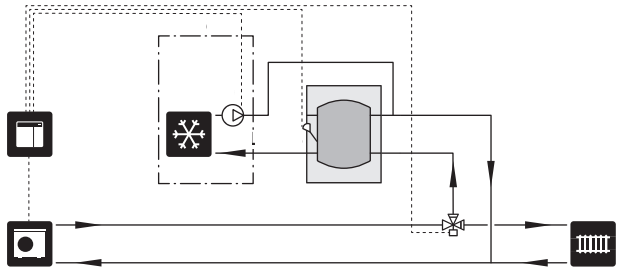
Cooling (in 2-pipe system)

Cooling and heating are distributed via the same climate system.



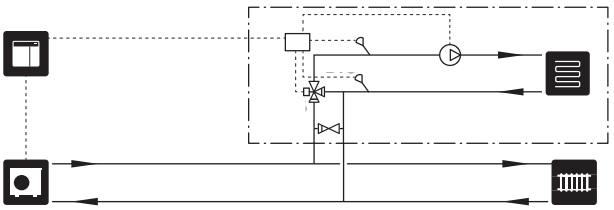
Cooling (in 4-pipe system)

With the accessory NIBE AXC 30, separate cooling and heating systems can be connected via a reversing valve. It is also possible to connect cooling (in 4 pipe systems) on AUX10 (relay K8) or AUX11 (relay K9).



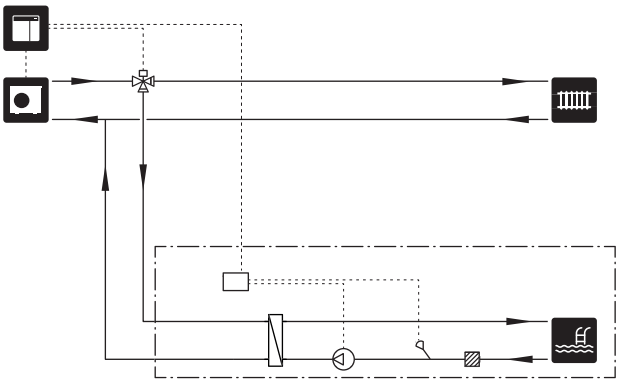
Extra climate system

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.



Pool

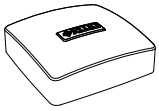
POOL 40 is an accessory that enables pool heating using one or more compressors in your installation.



Good to know about SMO S40

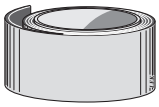
Supplied components

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

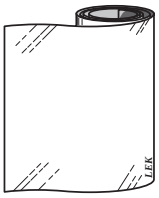


Outdoor temperature sensor

Room sensor

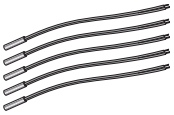


Insulation tape



Aluminium tape

Cable ties



Temperature sensor

Current sensor

Heating pipe paste

Mounting

For wall mounting, use screws (and plugs, where needed) suitable for the surface.

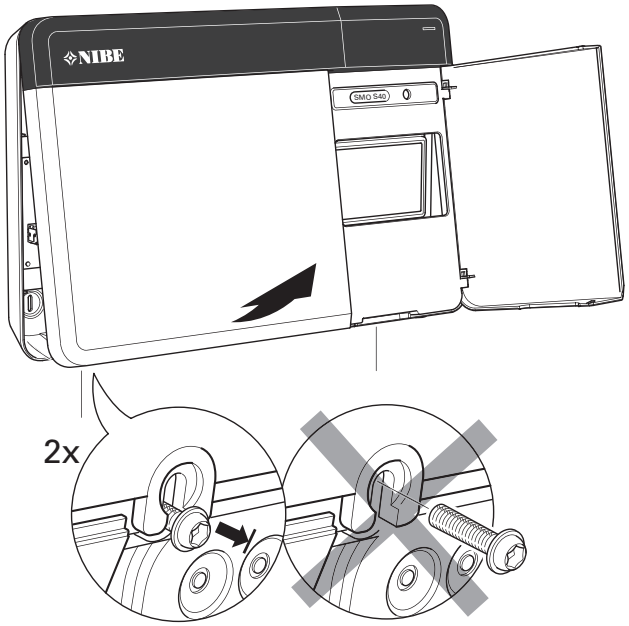
Use all mounting points and install SMO S40 upright flat against the wall without any part of the control module protruding beyond the edge of the wall.

Leave at least 100 mm free space around the control module to facilitate access and cable routing on installation and service.

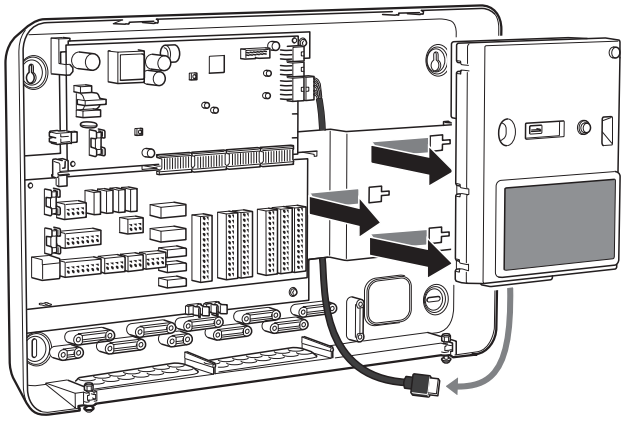
Screws for removing the front cover are reached from underneath.

SMO S40

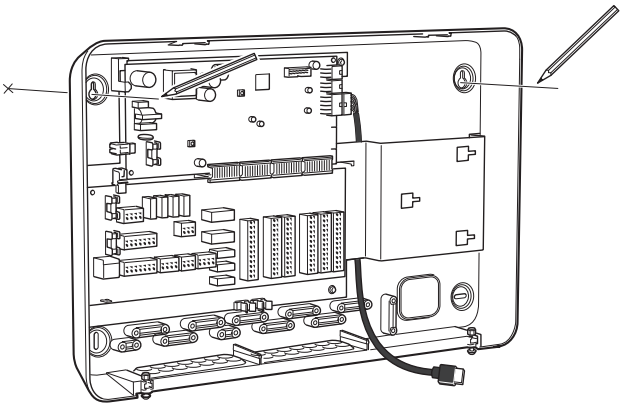
1. Remove the hatch, by unscrewing the screws in the bottom edge. Angle out at the bottom edge and unhook the cover at the upper edge.



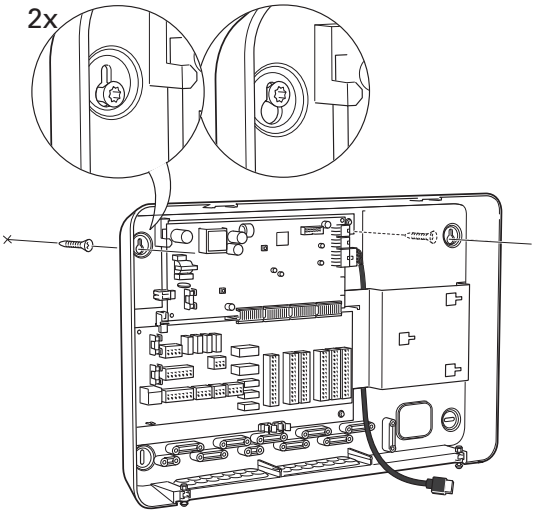
2. Remove the display by moving it to the left. Detach the cable from the lower edge.



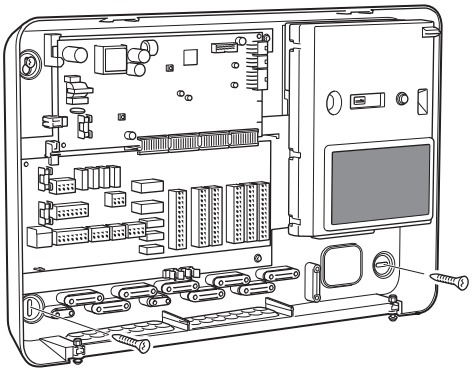
3. Mark the position of the two upper screws using a pen. Screw in the upper two screws.



4. Hook onto SMO S40 the screws in the wall.



5. Reassemble the display. Screw SMO S40 into place on the lower edge with the two remaining screws.



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 applicable regulations. See manual for compatible NIBE air/water heat pump for installation of the heat pump.

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)*
HBS 20-6/ AMS 20-6	0.19	20	22

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	0.35	25	28
F2120-16	0.38	25	28
F2120-20	0.48	32	35

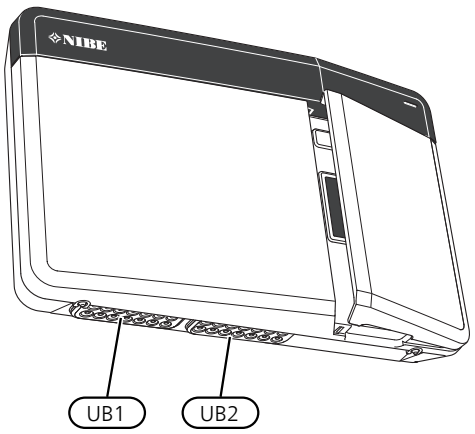
Air/water heat pump	*Minimum flow during defrosting (100% pump speed (l/s)*	*Minimum recommended pipe dimension (DN)*	*Minimum recommended pipe dimension (mm)*
F2040-6	0.19	20	22
F2040-8	0.19	20	22
F2040-12	0.29	20	22

Air/water heat pump	*Minimum flow during defrosting (100% pump speed (l/s)*	*Minimum recommended pipe dimension (DN)*	*Minimum recommended pipe dimension (mm)*
HBS 05-6/ AMS 10-6	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 connections

- Disconnect SMO S40 before insulation testing the house wiring.
- When the building is equipped with an earth-fault breaker the heat pump should be equipped with a separate one.
- SMO S40 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.
- Use a screened cable for communication with the heat pump.
- To prevent interference, sensor cables to external connections must not be laid close to high voltage cables.
- The minimum area of communication and sensor cables to external connections must be 0.5 mm² up to 50 m, for example EKKX, LiYY or equivalent.
- For an electrical wiring diagram for SMO S40, see the "Technical specifications" section in the Installer Manual.
- When routing a cable into SMO S40 the cable grommets (UB1 and UB2) must be used.



Do not start the system before filling up with water. Components in the system could be damaged.

Electrical installation and any servicing must be carried out under the supervision of a qualified electrician. Disconnect the current using the circuit breaker before carrying out any servicing.

Electrical installation and wiring must be carried out in accordance with the stipulations in force.

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.

Heat production

The supply of heat to the house is regulated in accordance with the selected heating curve setting. 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

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 called “More hot water”.

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

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 to which SMO S40 can be connected
- 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).

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.

SMART HOME

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

By allowing connected units to communicate with myUplink, 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 myUplink 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.

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.

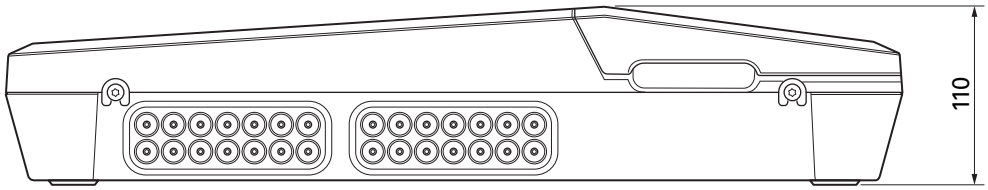
If you connect the product to the network, you can upgrade the software without using the USB port. See section "myUplink".

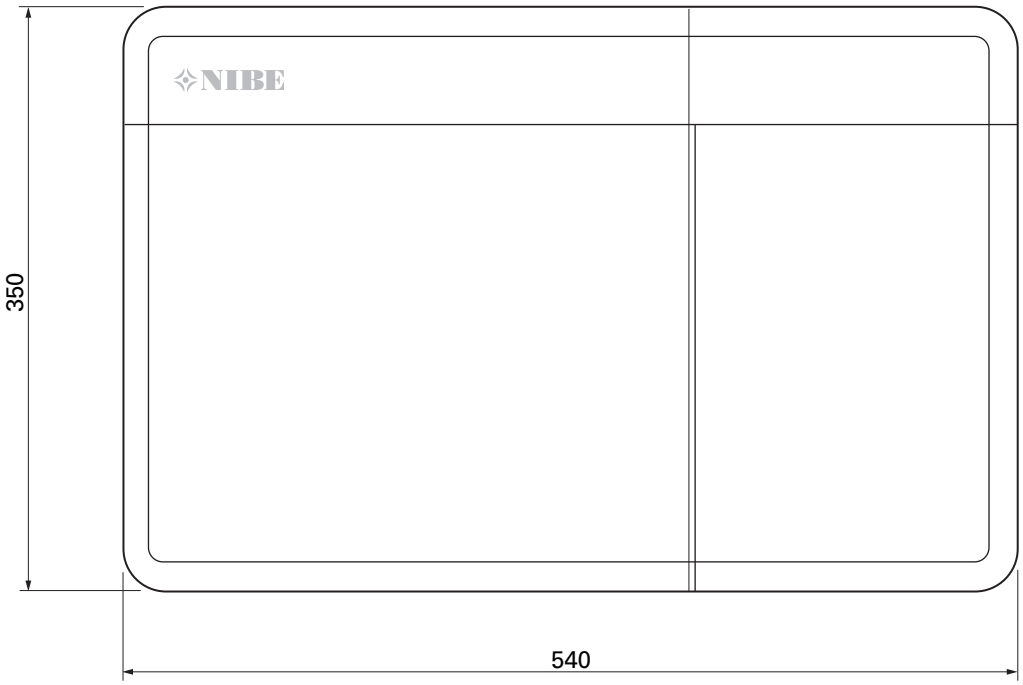
The display unit is equipped with a USB socket that can be used to update the software and save logged information in SMO S40.

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

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

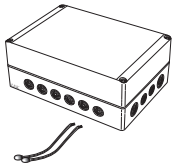
Accessories

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

Not all accessories are available on all markets.

Some accessories manufactured before 2019 may need to have their circuit board updated in order to be compatible with SMO S40. For more information, see the Installer Manual for the relevant accessory.

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.

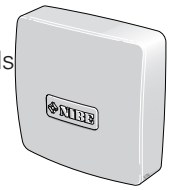
Auxiliary relay HR 10

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

Charge pump CPD 11

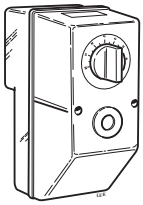
Charge pump for heat pump

Communication module for solar electricity EME 20



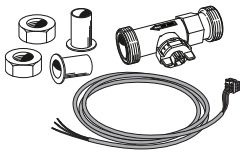
EME 20 is used to enable communication and control between inverters for solar cells from NIBE and SMO S40.

Connection box K11



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

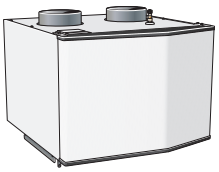
Energy measurement kit EMK 500



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.

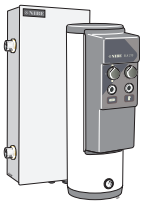
Cu pipe Ø28.

Exhaust air heat pump S135



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

External electric additional heat ELK



ELK 15

15 kW, 3x400V

ELK 26

26 kW, 3x400V

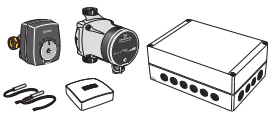
ELK 42

42 kW, 3x400V

ELK 213

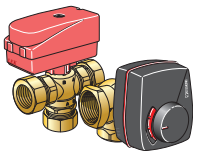
7–13 kW, 3x400V

Extra shunt group ECS 40/ECS 41



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

Hot water control



VST 05

Reversing valve, cu-pipe Ø22

Max. heat pump size 8 kW

VST 11

Reversing valve, cu-pipe Ø28

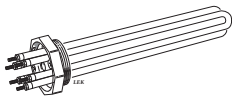
(Max recommended power, 17 kW)

VST 20

Reversing valve, cu-pipe Ø35

(Max recommended power, 40 kW)

Immersion heater IU



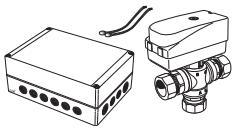
3 kW

6 kW

9 kW

Pool heating POOL 40

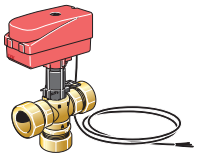
POOL 40 is used to enable pool heating with SMO S40.



Reversing valve for cooling

VCC 11

Reversing valve, Cu pipe Ø28 mm



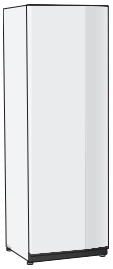
Room unit RMU S40

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

Water heater/Accumulator tank

AHPH S

Accumulator tank without an immersion heater with integrated hot water coil (stainless steel).



VPA

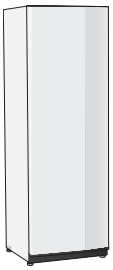
Water heater with double-jacketed vessel.

VPB

Water heater without immersion heater with charging coil.

VPB S

Water heater without immersion heater with charging coil.



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