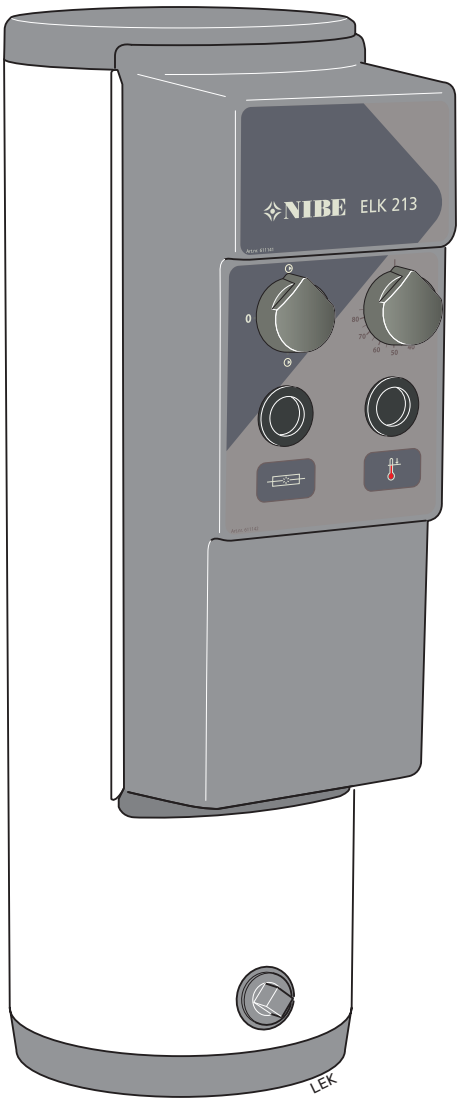
Installer manual

Electric heater
NIBE ELK 213



IHB EN 2205-10
031403

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Important information

Safety information

This manual describes installation and service procedures for implementation by specialists.

The manual must be left with the customer.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

This is an original manual. It may not be translated without the approval of NIBE.

ELK 213 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.

ELK 213 must not be used for heating tap water.

Symbols

NOTE

This symbol indicates danger to person or machine.

Caution

This symbol indicates important information about what you should consider when installing or servicing the installation.

TIP

This symbol indicates tips on how to facilitate using the product.

Marking

Explanation of symbols that may be present on the product's label(s).

Serial number

The serial number can be found on the type plate on the side of ELK 213.

Caution

You need the product's (14 digit) serial number for servicing and support.

Recovery

Leave the disposal of the packaging to the installer who installed the product or to special waste stations.

Do not dispose of used products with normal household waste. It must be disposed of at a special waste station or dealer who provides this type of service.

Improper disposal of the product by the user results in administrative penalties in accordance with current legislation.

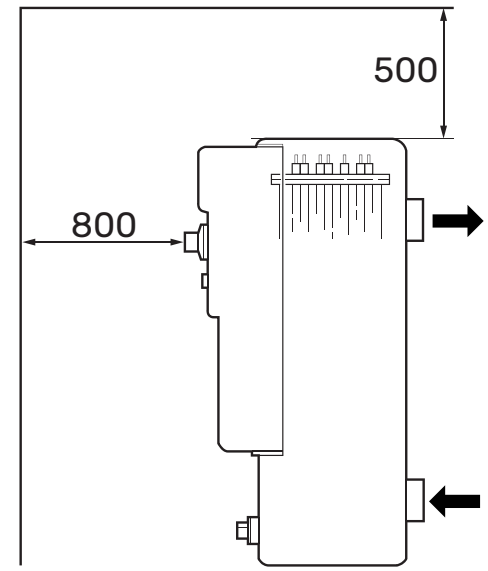
General

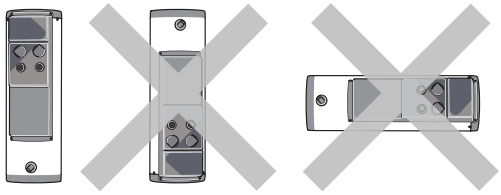
ELK 213 is an electric heater intended for heating buildings and indirect heating of hot water. ELK 213 can also be mounted together with a boiler, accumulator tank or heat pump. When installing together with a heat pump, for example, the electric heater is engaged automatically as supplementary heating when the heating demand is greater than the heat pump's capacity.

The stainless steel electric coils and electric boiler tube are made of acid-resistant steel (SIS 2333), which gives a very good service life.

ELK 213 contains temperature limiter and contactors to enable external control of the power.

ELK 213 is equipped with a time relay. Time delay is recommended when the connected power exceeds 6 kW. The thermostats for the immersion heater and isolator switch are operated by knobs on the control panel.





Compatible products

Connection is different depending on which product ELK 213 is to be used with.

These products can be connected directly to ELK 213:

- F1345
- F1355
- SMO 20
- SMO 40
- SMO S40

These products require the accessory AXC 40:

S-series

- S1155
- S1255
- VVM S320
- VVM S325

F-series

- F1145
- F1155
- F1245
- F1255
- VVM 225
- VVM 320
- VVM 325

VVM 310 requires the accessory DEH 310 .

VVM 500 requires the accessory DEH 500.

Contents

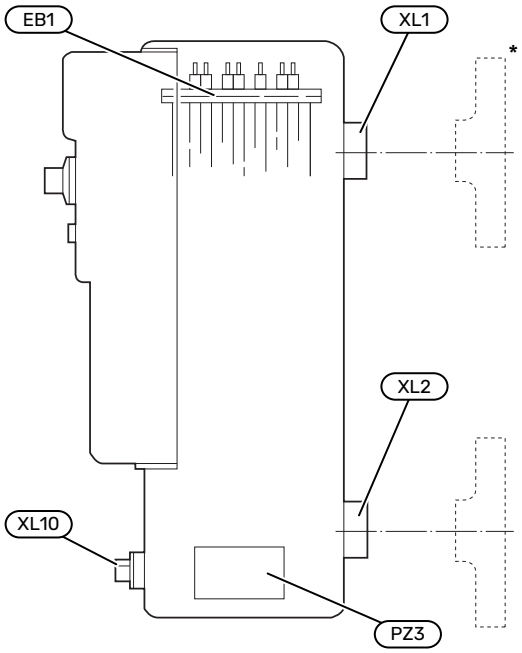
1 x Electric heater

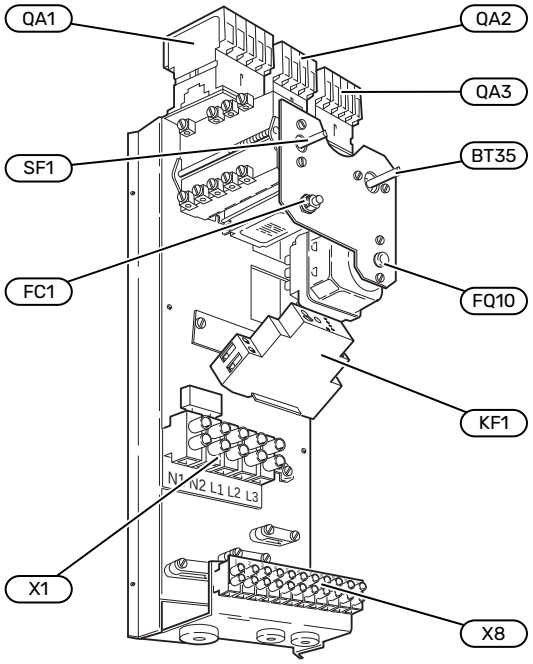
Assembly

The electric heater must be installed upright (see image below).

A free space of 800 mm in front of the water heater and 500 mm above is required to carry out servicing. If this is not possible, detachable connections must be used.

Component positions





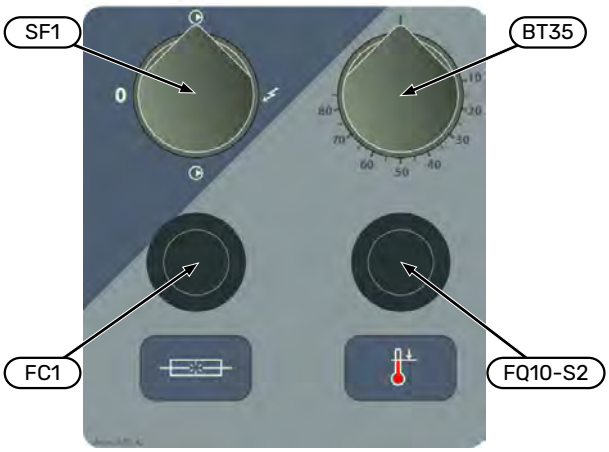
Component list

EB1	Immersion heater
BT35	Thermostat 3-pole
FC1	Miniature circuit-breaker
FQ10	Temperature limiter
KF1	Time relay
PZ3	Serial number plate
QA1	Contactor (-K10)
QA2	Contactor (-K22)
QA3	Contactor (-K21)
SF1	Switch
X1	Terminal block
X8	Terminal block
XL1	Connection supply line, R50
XL2	Connection return line, R50
XL10	Drain connection R20

* Counter flanges, R50. Accessory needed. See section "Accumulator tank (SP 300)" on page 9 for more information.

Designations according to standard EN 81346-2.

Front panel



> **NOTE**
>
> The switch (SF1) must not be put in "⚡" mode until the boiler has been filled with water. Otherwise, the temperature limiter, the thermostat and the immersion heater may be damaged.

Functions on the front panel

SF1 Switch

with 3 positions 0 - ⏵ - ⚡ :

- 0 Electric heater off (immersion heater and any connected devices not in operation).
- ⏵ Any circulation pump in operation.
- ⚡ Immersion heater operating (immersion heater and any connected devices in operation).

BT35 Immersion heater thermostat

This thermostat controls the immersion heaters.

FC1 Miniature circuit-breaker

Reset a tripped miniature circuit breaker by pushing the button.

FQ10-S2 Temperature limiter

Reset a tripped temperature limiter by pressing the button. Only do this once the cause of the fault has been rectified, see section "Troubleshooting" on page 16.

Pipe connections

General

The pipe installation must be carried out in accordance with applicable standards.

A circulation pump must be used to ensure the flow over the immersion heater. If the heating system valves can close the circulation completely, the bypass valve must be installed so that the flow through the electric heater does not stop. In closed installations an approved safety valve and pressure expansion vessel must be used.

Caution

Also see the installer manual for your heat pump/indoor module.

NOTE

The pipe work must be flushed before the electric heater is connected, so that any contaminants do not damage the component parts.

DRAINING

If a drain valve is necessary, it can be installed in the water heater's drain connection XL10). This connection can also be used as a circulation pump connection. The connection is plugged upon delivery.

SAFETY VALVE

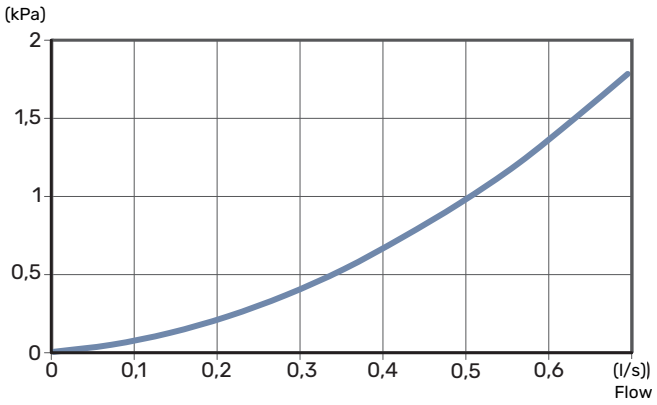
In closed boiler installations, the safety valves must be installed in connection with the highest part of the electric heater, but not directly on the heater. The connection line must rise continuously.

The safety valve must be "exercised" regularly, at least four times a year.

NOTE

The pipe work must be flushed before the electric heater is connected, so that any contaminants do not damage the component parts.

Pressure drop diagram ELK 213



System diagram

NOTE

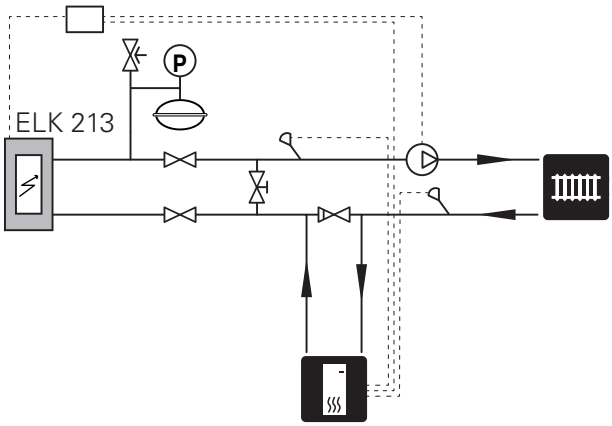
This is the outline diagram. Actual installations must be planned according to applicable standards.

SYMBOL KEY

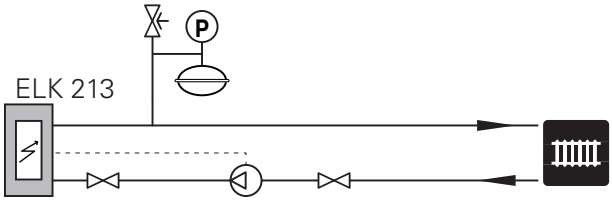
Symbol	Meaning
	Shut-off valve
	Non-return valve
	Mixing valve
	Circulation pump
	Expansion vessel
	Pressure gauge
	Safety valve
	Temperature sensor
	Trim valve
	Reversing valve/shunt
	Heat pump
	Radiator system
	Domestic hot water
	Hot water circulation

Designations according to standard EN 81346-2.

OUTLINE DIAGRAM



As a freestanding electric boiler



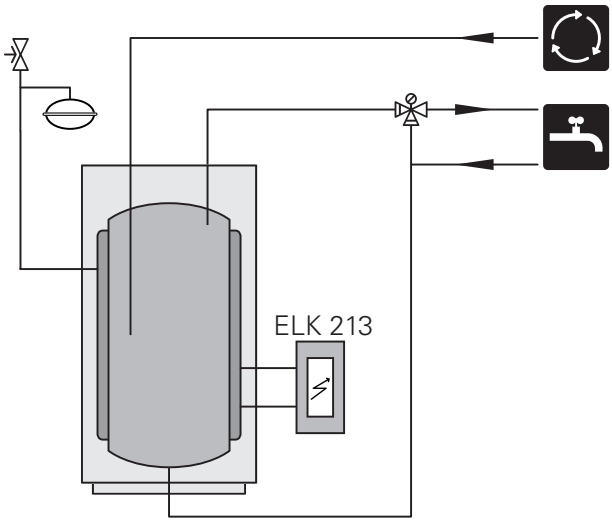
Installation alternative

ACCUMULATOR TANK (SP 300)

For installing ELK 213 to SP 300 accessory "Thread flange kit" is required (Part no. 022 077).

In the event of large hot water demands, ELK 213, installed on double-jacket accumulator tank type, can be used to heat the domestic hot water. This is also a good solution for aggressive or hard water.

Recommended thermostat setting: 75 °C

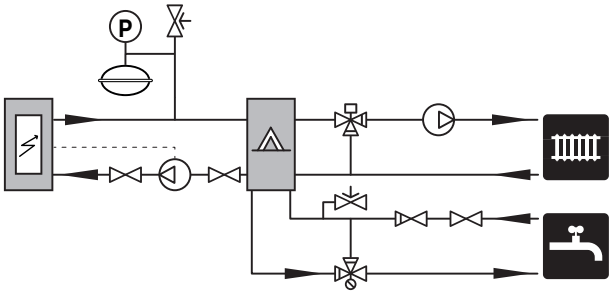


BOILER WITH INTERNAL WATER HEATER

With the immersion heater installed on an existing boiler, the existing control equipment is used.

Install the electric heater so that external heating does not cause overheating, for example, in front of the firebox door (to prevent flames blowing out) or next to the flue pipe (to prevent damaging heat radiation). A suitable location is normally at the side of the boiler, directly on the double jacketed heater's flanges or similar location.

When the electric heater is installed on the existing wood boiler and is solely responsible for the heating demand, the flue should be sealed.



Electrical connection

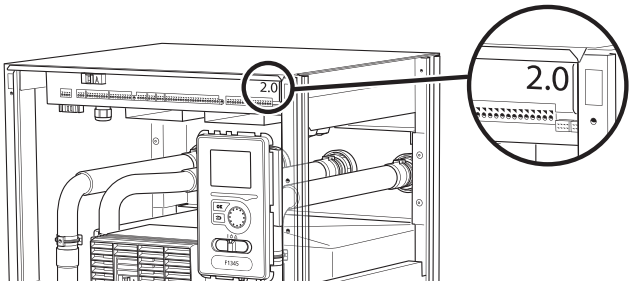
> **NOTE**
> All electrical connections must be carried out by an authorised electrician.
>
> Electrical installation and wiring must be carried out in accordance with the stipulations in force.
>
> The climate unit must not be powered when installing ELK 213.

ELK 213 must be installed on terminal block X1 via a circuit breaker with a minimum breaking gap of 3 mm.

The electrical circuit diagram is at the end of this Installer handbook.

Electrical connection versions F1345

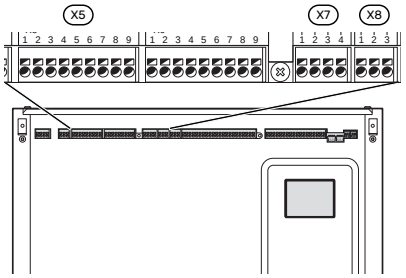
F1345 has different electrical connection versions depending on when the heat pump was manufactured. To check which electrical connection applies to your F1345, check the designation "2.0" visible above the right hand side of the terminal block as illustrated.

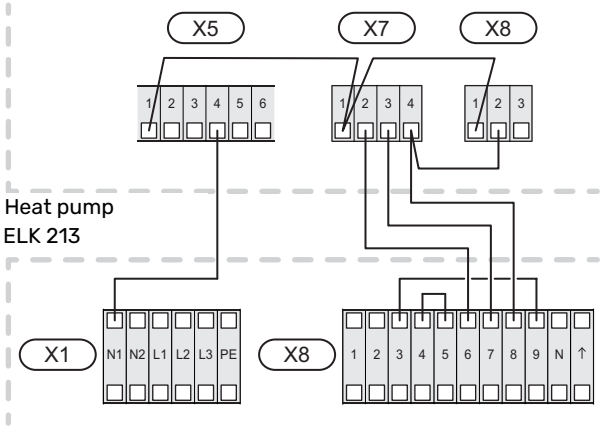


If ELK 213 is to be controlled externally, the straps between X8:1-X8:6, X8:2-X8:7 and X1:N1-X1:N2 must be removed. In addition, the strap between X8:3-X8:5 must be moved so that it runs between X8:3-X8:9.

F1345 2.0 / F1355

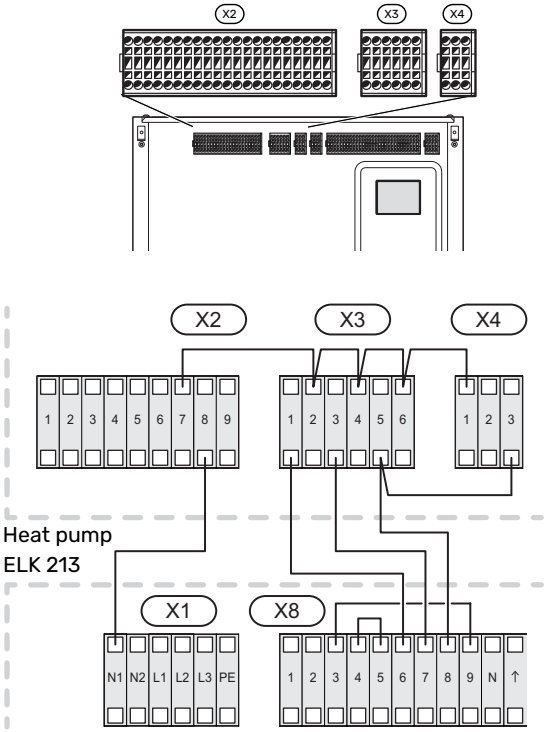
Terminal blocks X1 and X8 in ELK 213 connect to the terminal blocks X5, X7 and X8 on the input board AA101 in the heat pump as illustrated.





F1345

Terminal blocks X1 and X8 in ELK 213 connect to the terminal blocks X2-X4 in the heat pump as illustrated.

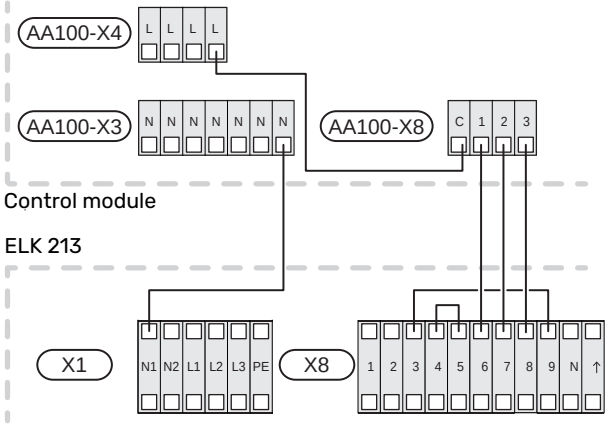


SMO S40

For connecting ELK 213 to SMO S40.

Terminal blocks X1 and X8 in ELK 213 connect to terminal blocks AA100-X3 and AA100-X8 in SMO S40 as illustrated.

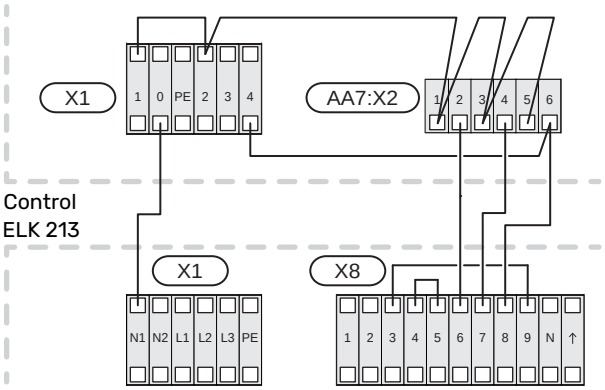
Terminal block AA100-X4 connect to terminal block AA100-X8 as illustrated.



SMO 20 and SMO 40

For connecting ELK 213 to SMO 20 and SMO 40.

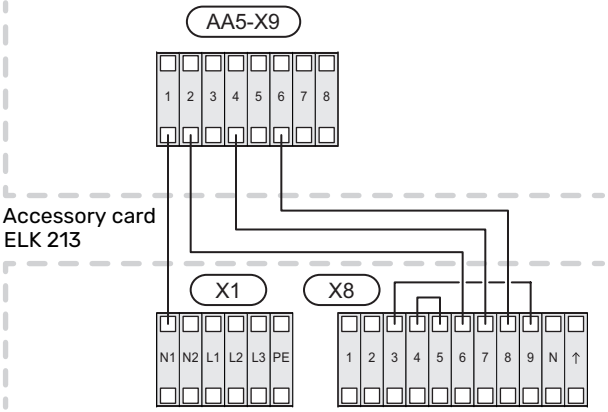
Terminal blocks X1 and X8 in ELK 213 connect to terminal blocks X1 and AA7-X2 in SMO 20 and SMO 40 as illustrated.



S1155, S1255, VVM S320, VVM S325

For connecting ELK 213 via accessory board AXC 40.

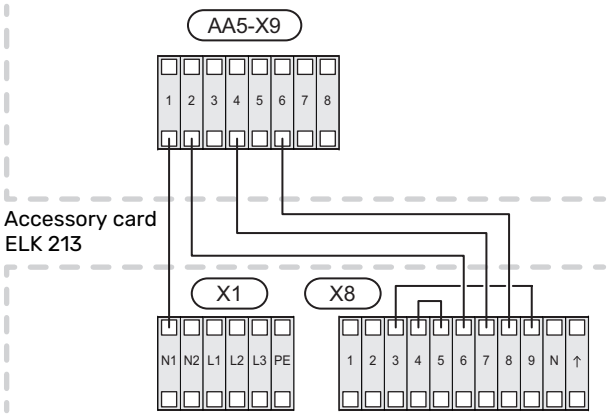
Terminal blocks X1 and X8 in ELK 213 connect to terminal block AA5-X9 in AXC 40 as illustrated.



F1145, F1155, F1245, F1255, VVM 225, VVM 310, VVM 320, VVM 325 and VVM 500

For connecting ELK 213 via accessory board AXC 40.

Terminal blocks X1 and X8 in ELK 213 connect to terminal block AA5-X9 in AXC 40 as illustrated.



Power supply

The power cable must be selected for the relevant power and connected to terminal block X1.

Upon delivery the electric heater has three unopened cable grommets. These are for supply, external control, circulation pump and load monitor.

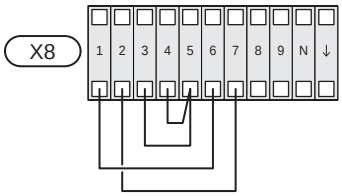
Output

The immersion heater can be set up to a maximum of 13 kW. The delivery setting is 9 kW in two steps.

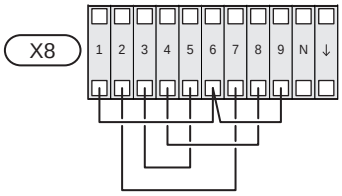
The immersion heater's power output is divided into steps, 7, 9, 11 and 13 kW. Switching to another power output is performed at the top of the electric water heater, directly on the immersion heater's connections and on terminal block (X8) in the electrical connection.

The power output can be controlled in three steps in all powers and in two steps for power outputs 7 and 9 kW. Powers 11 and 13 kW must not be controlled in two steps. Change-over occurs on terminal block (X8) using the wiring enclosed.

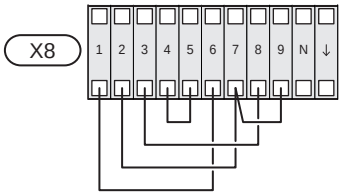
9 kW in two steps (delivery setting)



7/9 kW in three steps



11/13 kW in three steps



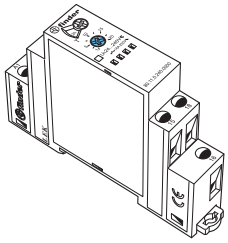
CONTROLLING THE IMMERSION HEATER

> **NOTE**
> It is recommended that ELK 213 is linearly controlled. If binary control is still required, ensure that step one has lowest output, step two next highest output and step three the highest output.

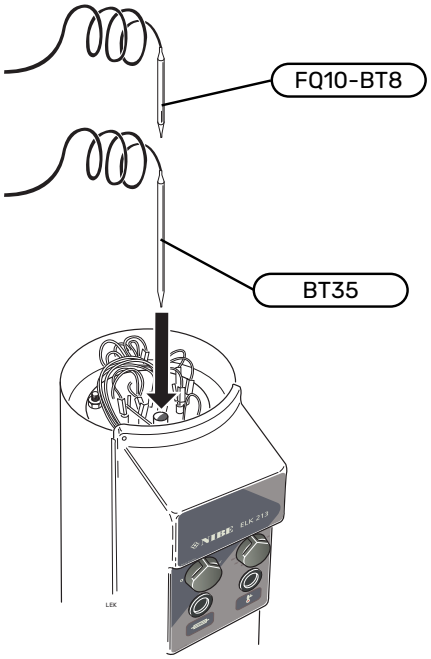
Set output (kW)	Power step (kW)
7	1, 2, 4
9	2, 3, 4
11	1, 4, 6
13	3, 4, 6

Time relay

ELK 213 is equipped with a time relay (KF1), which blocks part of the immersion heater via contactor (QA2) so that a maximum of 6 kW is connected during the first two hours after ELK 213 has been disconnected.



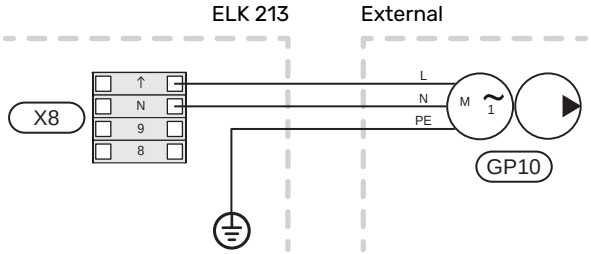
Sensors



1. Install the thermostat bulb BT35.
2. Install the temperature limiter bulb FQ10-BT8.

Connection of the circulation pump (GP10)

Connect the cable for any circulation pump fitted to terminal block (X8), fused with miniature circuit breaker (FC1) on 10 A and routed through separate strain-relief.



Program settings

Program setting the ELK 213 can be performed via the start guide or directly in the menu system in your compatible heat pump/indoor module.

> **Caution**
>
> Also see the Installer manual for the product that ELK 213 will be connected to.

The start guide appears at the first start-up after installation, but can also be found in menu 7.7 in the S-series and 5.7 in the F-Series.

Menu system

S-SERIES

SMO S40, S1155, S1255, VVM S320 and VVM S325

Information about menu settings for the above products can be found in the manual for AXC 40 or in the main product's manual.

Menu 7.2.1 - Add/remove accessories

Add or remove accessories here.

Select "Step-controlled additional heat".

Menu 7.2.6 - Step-controlled additional heat (AXC)

Here you can perform the following settings:

- Select when the addition is to start.
- Set max permitted number of additional steps.
- If binary stepping is to be used.

> **Caution**
>
> "Start additional heat" in the menus 7.2.6 (external step-controlled additional heat) and 7.1.10.3 (degree minute settings internal additional heat) are factory set at 400DM. If both of the additional heat options are used and you want to have more steps, the start difference needs to be changed in one of the menus.

Menu 7.5.3 - Forced control

Forced control of the various components in the main product and of any connected accessories.

- EB1-AA5-K4: Activating the circulation pump (GP10).
- EB1-AA5-K1: Activating additional step 1.
- EB1-AA5-K2: Activating additional step 2.
- EB1-AA5-K3: Activating additional step 3.
- Setting of 0–10 V stepless forced control.

See the "General" section on page5 to see which accessory is required for your product.

F-SERIES

F1345, F1355, SMO 20 and SMO 40

Menu 4.9.3 - degree minute setting

Here you select when the additional heat is to start and the degree minute intervals.

Menu 5.1.12 - addition

add. heat in tank
Setting range: on/off

Factory setting, fuse: off

max step
Setting range (binary stepping deactivated): 0 – 3

Setting range (binary stepping activated): 0 – 7

Default value: 3

fuse size
Setting range: 1 - 400 A

Factory setting: 16 A

transformation ratio
Setting range: 300 - 2500

Factory setting: 300

Here, you select whether the step-controlled additional heat is placed before or after the reversing valve for hot water charging (QN10). Step-controlled additional heat could be, for example, an external electric boiler.

Here you can set the max permitted number of additional heat steps and binary or linear stepping. When binary stepping is deactivated (off), the settings refer to linear stepping.

If the hot water accessory is available and additional heat location is selected as "after QN10" and additional heat in the tank is selected, the number of steps are restricted to 2 steps linear or 3 steps binary. Output AA7-X2:6 is reserved in this mode for additional heat in the hot water tank.

You can also set the fuse size.

> **TIP**
>
> See the accessory installation instructions for function description.

Menu 5.2 - system settings

Activating/deactivating of accessories.

Select: "step controlled add. heat".

Menu 5.3.6 - step controlled add. heat

Here you can perform the following settings:

- Select when the addition is to start.
- Set max permitted number of additional steps.
- If binary stepping is to be used.

> **Caution**
>
> "start additional heat" in the menus 5.3.6 (external step-controlled additional heat) and 4.9.3 (degree minute settings internal additional heat) are factory set at 400DM. If both of the additional heat options are used and you want to have more steps, the start difference needs to be changed in one of the menus.

Menu 5.6 - forced control

Forced control of the different components in the heat pump as well as in the different accessories that may be connected.

- EB1-AA5-K1: Activating additional step 1.
- EB1-AA5-K2: Activating additional step 2.
- EB1-AA5-K3: Activating additional step 3.
- EB1-AA5-K4: Activating the circulation pump (GP10).

> **Caution**
>
> Linear stepping of ELK 213 is recommended.

F1145, F1155, F1245, F1255, VVM 225, VVM 310, VVM 320, VVM 325 and VVM 500

Information about menu settings for the products above is in the manuals for AXC 40, DEH 310 and DEH 500.

Menu 5.2 - system settings

Activating/deactivating of accessories.

Select: "step controlled add. heat".

Menu 5.3.6 - step controlled add. heat

Here you can perform the following settings:

- Select when the addition is to start.
- Set max permitted number of additional steps.
- If binary stepping is to be used.

> **Caution**
>
> "start additional heat" in the menus 5.3.6 (external step-controlled additional heat) and 4.9.3 (degree minute settings internal additional heat) are factory set at 400DM. If both of the additional heat options are used and you want to have more steps, the start difference needs to be changed in one of the menus.

Menu 5.6 - forced control

Forced control of the different components in the heat pump as well as in the different accessories that may be connected.

- EB1-AA5-K1: Activating additional step 1.
- EB1-AA5-K2: Activating additional step 2.
- EB1-AA5-K3: Activating additional step 3.
- EB1-AA5-K4: Activating the circulation pump (GP10).

See the ”General” section on page5 to see which accessory is required for your product.

Disturbances in comfort

Troubleshooting

TIP

In the event of malfunction or operating malfunction, first check the points below.

NOTE

Work behind covers secured by screws may only be carried out by, or under the supervision of, a qualified installation engineer.

NOTE

In the event of action to rectify malfunctions that require work within screwed hatches, the incoming supply electricity must be isolated at the safety switch.

LOW ROOM TEMPERATURE

- Circuit or main MCB tripped.
- Possible earth circuit-breaker tripped.
- Switch (SF1) set in position "0" or "⏵".
- Miniature circuit breaker (FC1) has deployed.
- The temperature limiter (FQ10) has tripped If the temperature limiter has tripped, the function of the system's circulation pumps and valves must be checked. To reset, press the button on the temperature limiter when the temperature has fallen below 80°C.
- Circulation pump has stopped.
- Air in the electric boiler or the heating system.
- The pressure is to low in the expansion vessel.
- The load monitor or some external control unit may have blocked the power output.

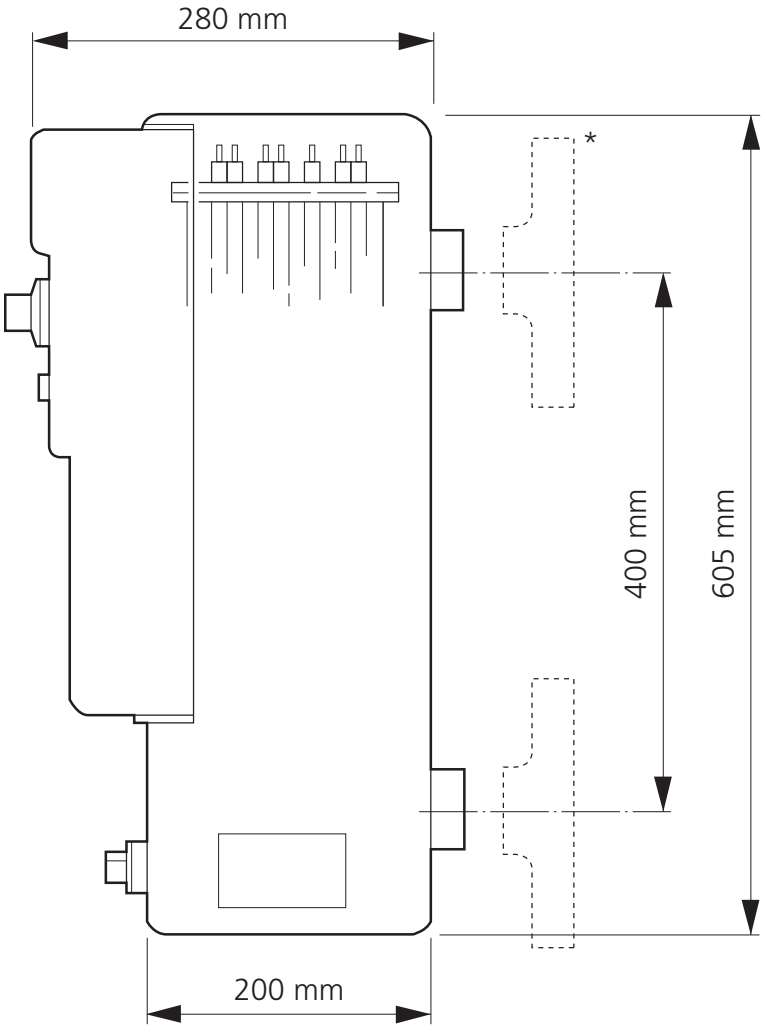
POOR CIRCULATION

- Circulation pump, if fitted is stationary.

Technical data

Dimensions

All dimensions in mm.



* Counter flanges, R50. Accessory is required.

Technical specifications

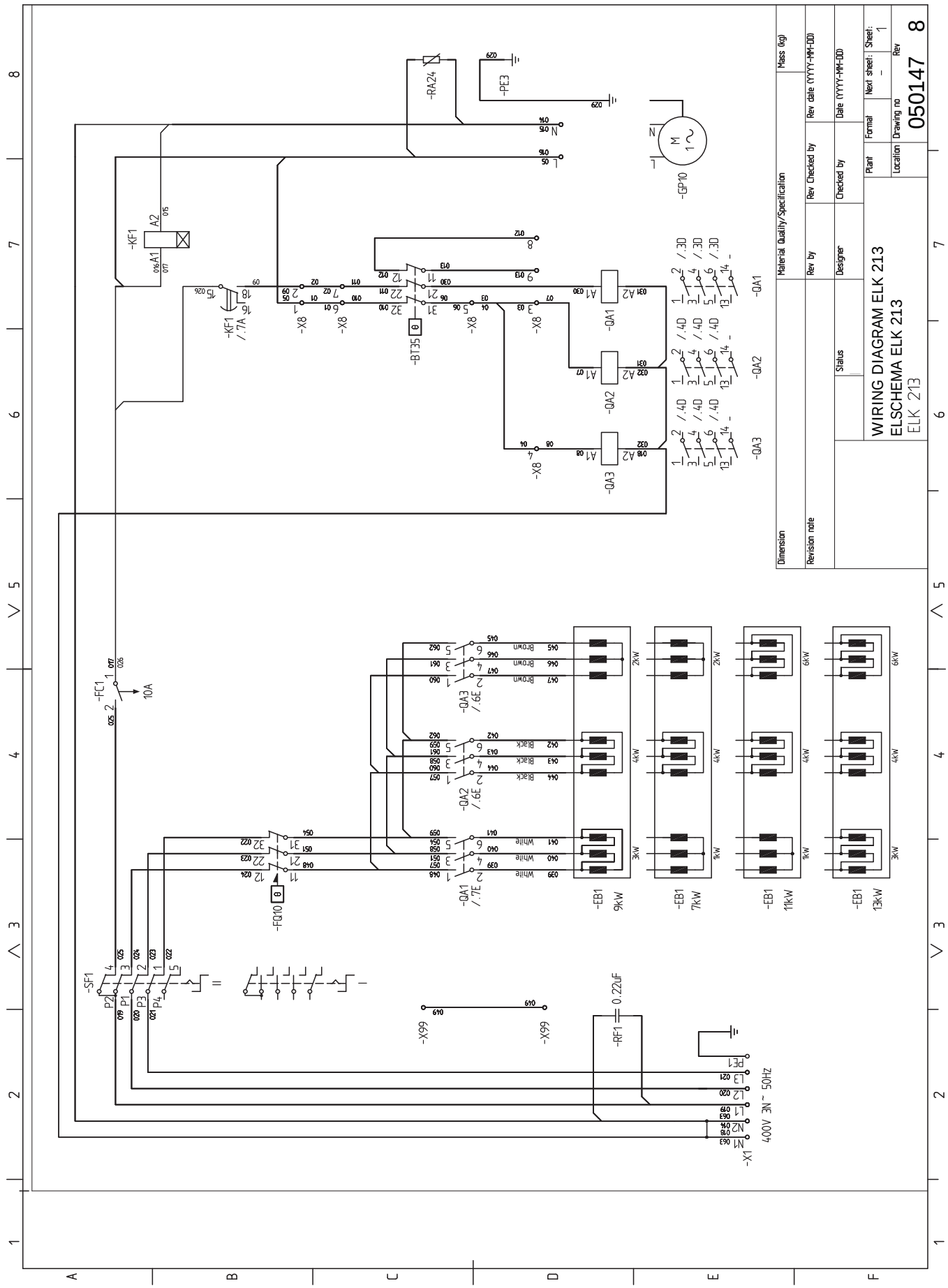
Type		
Electrical data		
Rated voltage		400V 3N ~ 50Hz
Max output, electric heater	kW	13 (output on delivery 9 kW)
Max. permitted total current for connected apparatus	A	10
Recommended fuse rating immersion heater	A	20
Enclosure class		IP21
Heating medium circuit		
Max permitted pressure in the boiler	MPa/bar	0.3/3
Min. flow/max. flow	l/h	- / 1800
Dimensions and weight		
Width	mm	200
Depth	mm	280
Height	mm	605
Weight	kg	18
Volume	litre	7
Miscellaneous		
Substances according to Directive (EG) no. 1907/2006, article 33 (Reach)		Lead in brass components
Part No.		069 500

Energy labelling

Supplier		NIBE
Model		**ELK 213**
Energy efficiency class for space heating		D
Rated heat output (Pdesignh)	kW	9
Annual energy consumption space heating	kWh	20,310
Seasonal space heating energy efficiency	%	36.6
Sound power level L_{WA} indoors	dB	35

Model		ELK 213					
Condensing boiler		☐ Yes ☒ No					
Low-temperature boiler		☐ Yes ☒ No					
B11 boiler		☐ Yes ☒ No					
Cogeneration space heater		☐ Yes ☒ No					
Combination heater		☐ Yes ☒ No					
Rated heat output	Prated	9	kW	Seasonal space heating energy efficiency	η_s	36.6	%
For boiler space heaters and boiler combination heaters: Useful heat output				**For boiler space heaters and boiler combination heaters: Useful efficiency**			
At rated heat output and high-temperature regime	P_4	9	kW	At rated heat output and high-temperature regime	η_4	40	%
At 30 % of rated heat output and low-temperature regime	P_1		kW	At 30 % of rated heat output and low-temperature regime	η_1		%
Auxiliary electricity consumption				**Other items**			
At full load	elmax		kW	Standby heat loss	P_{stby}	0.15	kW
At part load	elmin		kW	Ignition burner power consumption	P_{ign}		kW
Standby mode	P_{SB}	0.01	kW	Annual energy consumption	Q_{HE}	20,310	kWh
				Sound power level, indoors	L_{WA}	35	dB
For combination heaters							
Declared load profile for water heating				Water heating energy efficiency	η_{wh}		%
Daily energy consumption	Q_{elec}		kWh	Daily fuel consumption	Q_{fuel}		kWh
Annual energy consumption	AEC		kWh	Annual fuel consumption	AFC		GJ

Electrical circuit diagram



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