

Installer manual ELK 213

Immersion heater

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1 Important information

Safety information

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

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.

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Symbols



NOTE

This symbol indicates danger to person or machine.



Caution

This symbol indicates important information about what you should observe when maintaining your installation.



TIP

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

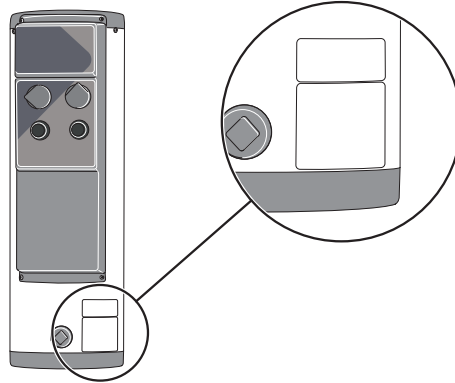
Marking

CE The CE mark is obligatory for most products sold in the EU, regardless of where they are made.

IP21 Classification of enclosure of electro-technical equipment.

Serial number

The serial number can be found at the bottom right 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.

Country specific information

Installer manual

This installer manual must be left with the customer.

2 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.

ELK 213 contains overheat protection and contactors for external control of the four power groups, 7, 9, 11 and 13 kW. Thermostat for the immersion heater and isolator switch operated by knob on the control panel.

The stainless steel electric coils and electric boiler tube in ELK 213 are made of stainless steel (SIS 2333), which gives a very good service life.

ELK 213 is equipped with a time relay. Time delay is recommended by the Swedish Power Association when connected power exceeds 6 kW.

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

These products require the accessory AXC 40:

- F1145
- F1155

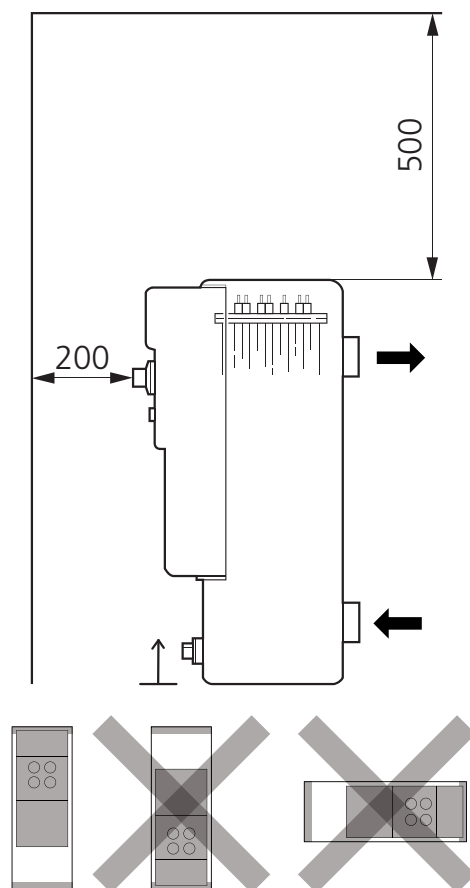
Contents

1 x Immersion heater

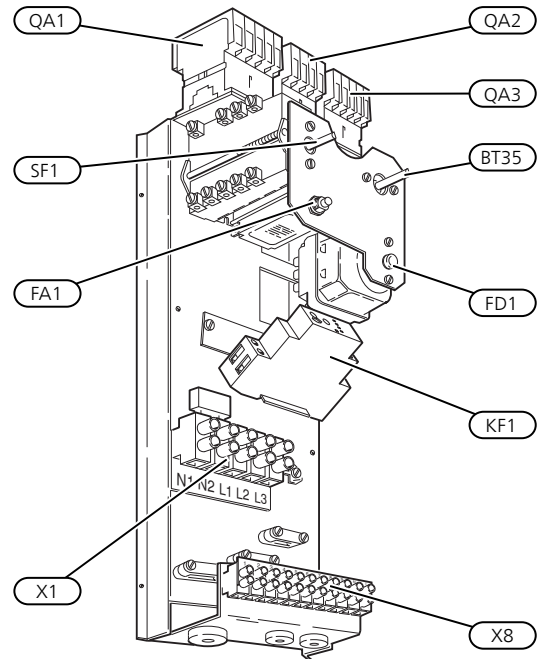
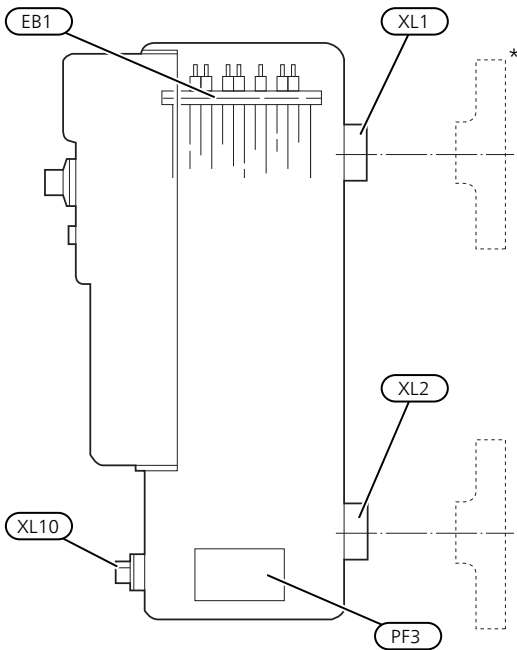
Assembly

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

Free space of 200 mm in front and 500 mm above the cassette is required for service. If this is not possible, detachable connections must be used.



3 Component positions

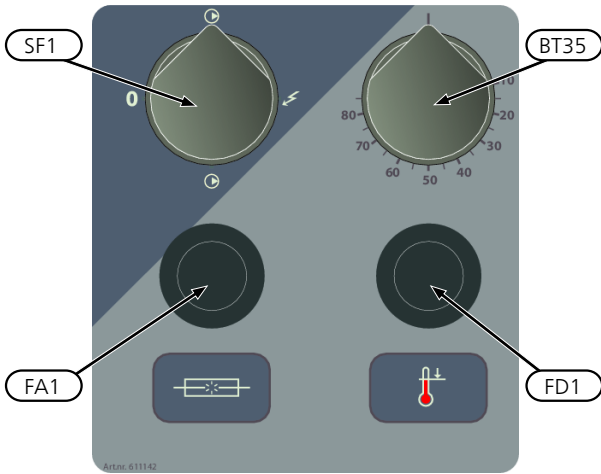


Component list

EB1	Immersion heater
BT35	Thermostat 3-pole
FA1	Miniature circuit-breaker
FD1	Temperature limiter
KF1	Time relay
PF3	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 10 for more information.

Front panel



NOTE

The switch (SF1) must not be put in "↗" mode before the boiler water has been filled. The overheat protection, thermostat and the immersion heater could 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.

FA1 Miniature circuit-breaker

Reset a tripped miniature circuit breaker by pushing the button.

FD1 Overheat protection

Reset overheat protection by pushing the button. The fault must be rectified before doing this, see section "Troubleshooting" on page 18.

4 Pipe connections

General

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

ELK 213 can be installed as a freestanding electric boiler or as an electric heater with another heat source.

Tapping valve

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.

Circulation pump

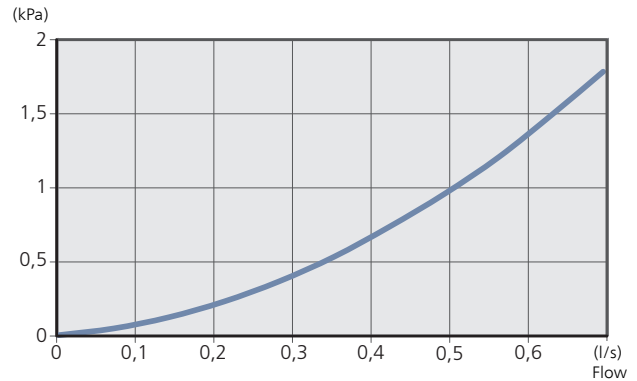
A circulation pump must be used to ensure the flow over the immersion heater. If the heating system valves can close the circulation completely, a bypass valve must be installed so that the flow through the electric heater does not stop. For a closed boiler installation, a pressure expansion valve must be installed.

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.

Pressure drop diagram



NOTE

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

System diagram



TIP

See www.nibe.eu for complete docking principles.



NOTE

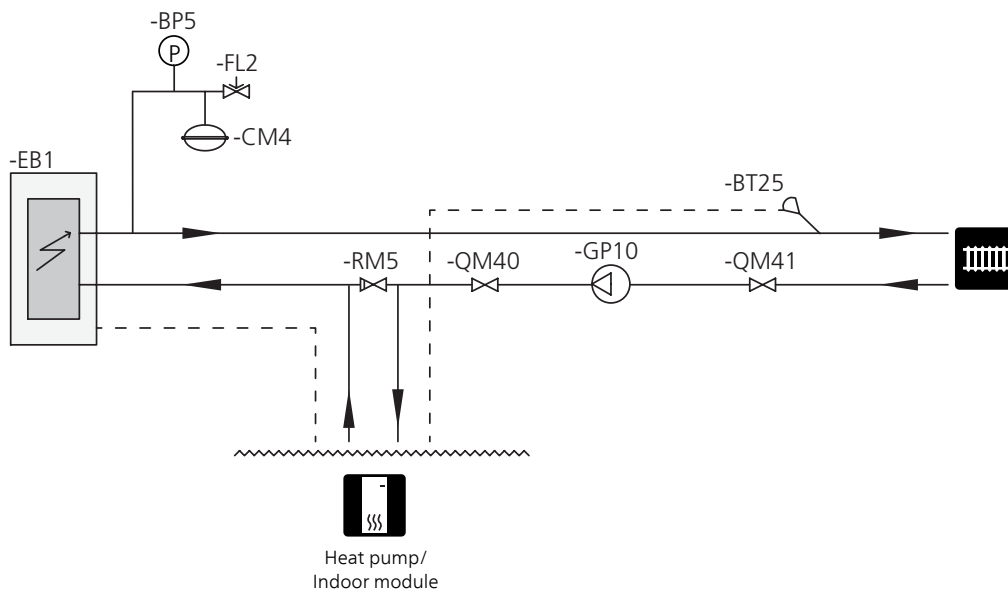
This is the outline diagram. Actual installations must be planned according to applicable standards.

Explanation

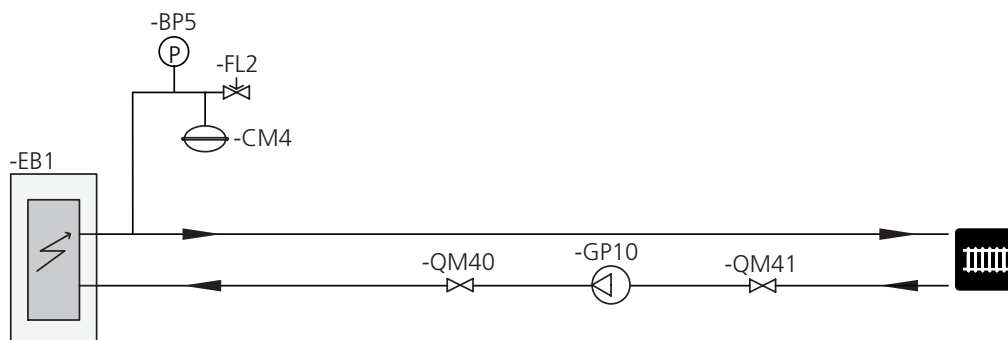
EB1	Electric heater ELK 213
BP5	Pressure gauge
CM4	Expansion vessel
FL2	Safety valve
GP10	Circulation pump
QM40 - QM41	Shut off valves
QN11	Shunt valve
RM5	Non-return valve

Designations in component locations according to standard IEC 81346-1 and 81346-2.

ELK 213 as electric heater



ELK 213 as freestanding boiler



Installation alternative

Accumulator tank (SP 300)

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

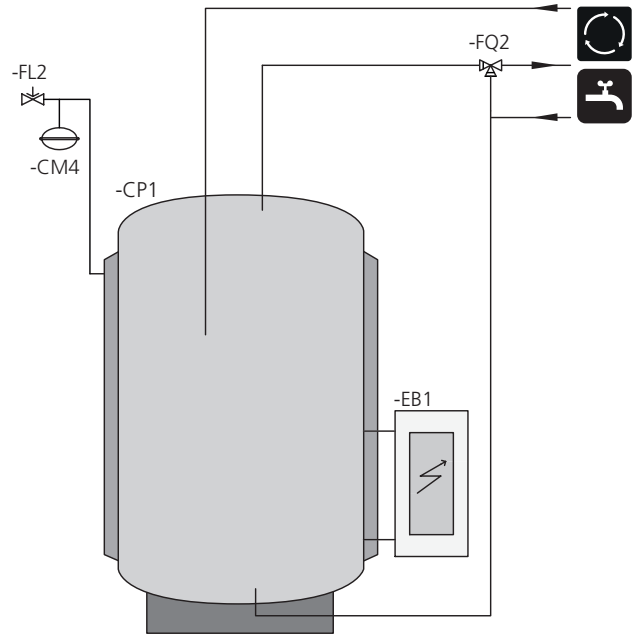
In the event of large hot water demands, ELK 213, installed on double-jacket accumulator tank type, can be used to heat the domestic hot water. This is also a good solution for aggressive or hard water.

Recommended thermostat setting: 75 °C

Explanation

CM4	Expansion vessel
CP1	SP 300
EB1	ELK 213
FL2	Safety valve, heating medium side
FQ2	Mixer valve, external heat source

Designations in component locations according to standard IEC 81346-1 and 81346-2.



Boiler with internal water heater

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

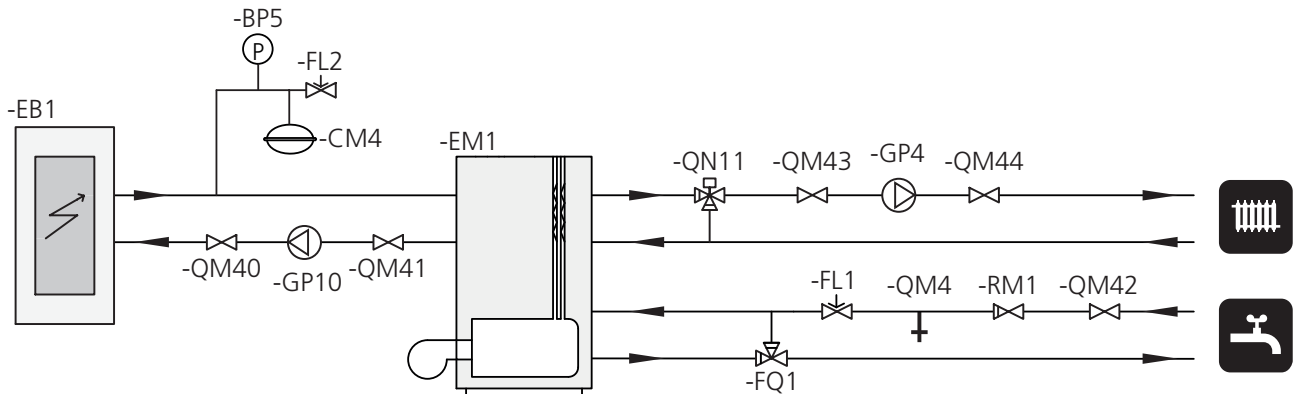
Install the electric heater so that external heating does not cause overheating, for example, in front of the fire-box door (to prevent flames blowing out) or next to the flue pipe (to prevent damaging heat radiation). A suitable location is normally at the side of the boiler, directly on the double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

Explanation

BP5	Pressure gauge
CM4	Expansion vessel
EB1	ELK 213
EM1	Oil/gas boiler
FL1	Safety valve, hot water
FL2	Safety valve, heating medium side
FQ1	Mixing valve
GP4	Circulation pump, boiler
GP10	Circulation pump, heating medium external
QM4	Tapping valve
QM40 - QM44	Shut-off valve
QN11	Shunt valve
RM1	Non-return valve

Designations in component locations according to standard IEC 81346-1 and 81346-2.



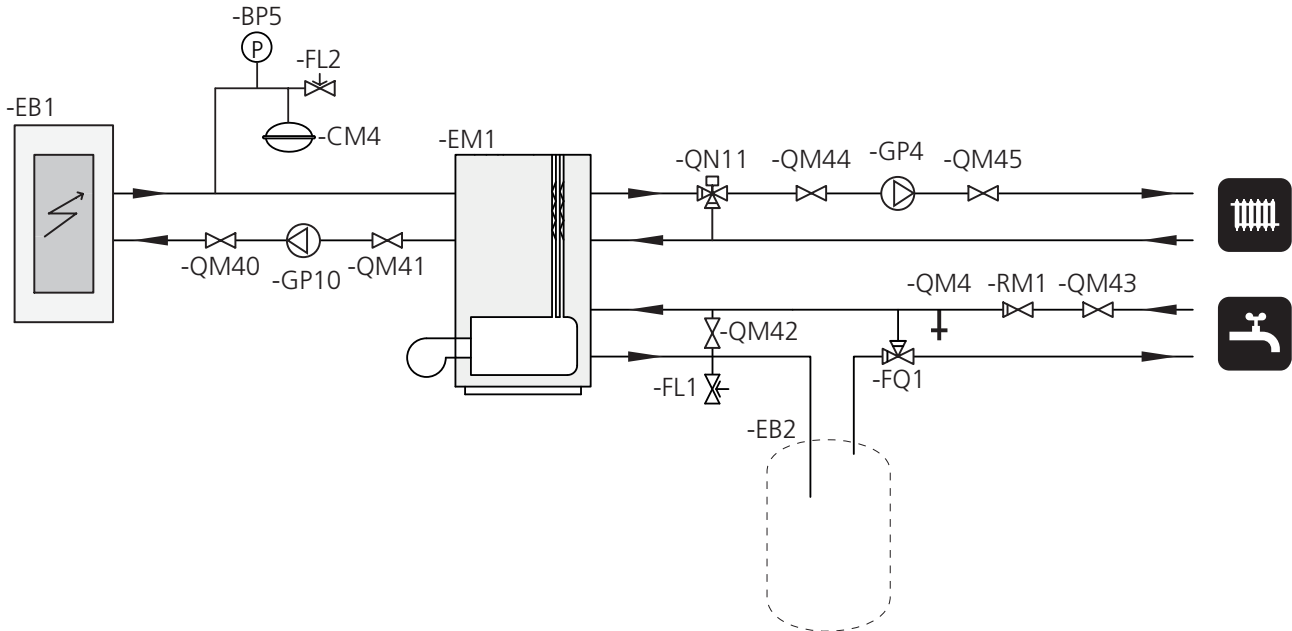
Boiler with external water heater

When supplementing with the hot water heater, it is best to equip the installation with a shut-off valve QM42, which, during the summer time, when the electric hot water heater is solely responsible for the hot water supply, by-passes the existing hot water coil. This prevents condensation and increases the service life of the boiler.

Explanation

BP5	Pressure gauge
CM4	Expansion vessel
EB1	ELK 213
EB2	Water heater
EM1	Oil/gas boiler
FL1	Safety valve, hot water
FL2	Safety valve, heating medium side
FQ1	Mixing valve
GP4	Circulation pump, boiler
GP10	Circulation pump, heating medium external
QM4	Tapping valve
QM40 - QM45	Shut-off valve
QN11	Shunt valve
RM1	Non-return valve

Designations in component locations according to standard IEC 81346-1 and 81346-2.



5 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.

NOTE
 To prevent interference in the event of any splicing, communication and/or sensor cables to external connections must not be laid closer than 20 cm from high voltage cables.

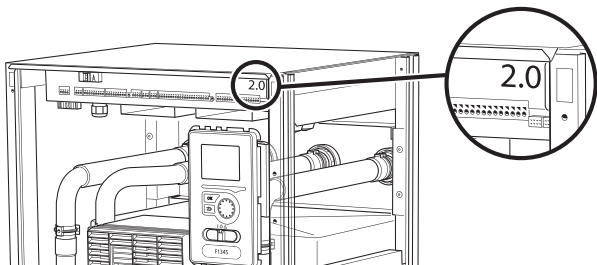
ELK 213 must be installed via a circuit breaker with a minimum breaking gap of 3 mm.
 All electrical equipment is connected at the factory.
 Do not connect the electric heater without the permission of the electricity supplier.
 The electrical circuit diagram is at the end of this Installer handbook.

NOTE
 Reset the overheat protection, it may have tripped during transport.

NOTE
 The switch (SF1) must not be put in "↙" mode before the boiler water has been filled. The overheat protection, thermostat and the immersion heater could be damaged.

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.

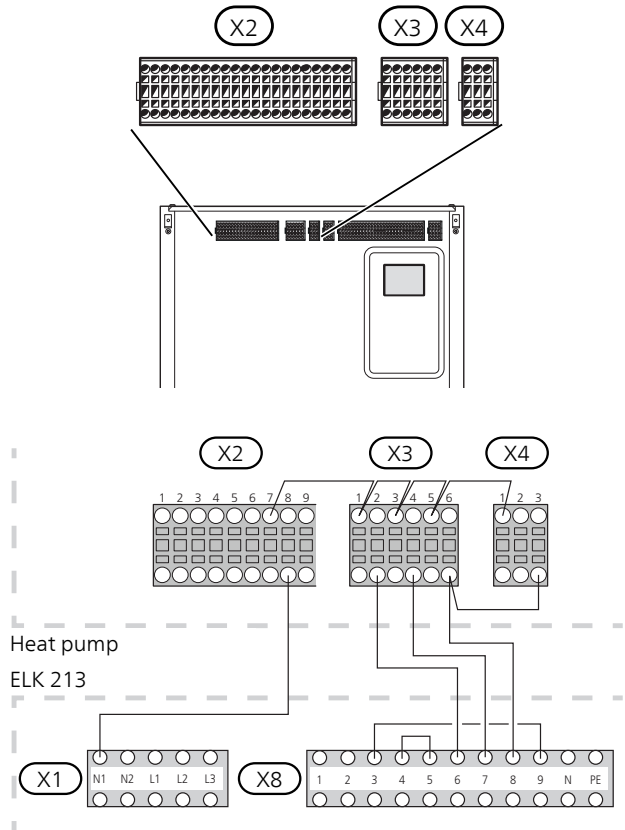


External control

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.

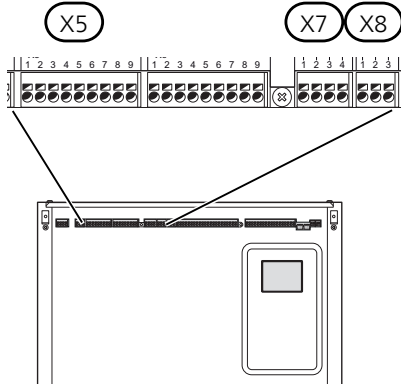
F1345 without 2.0

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

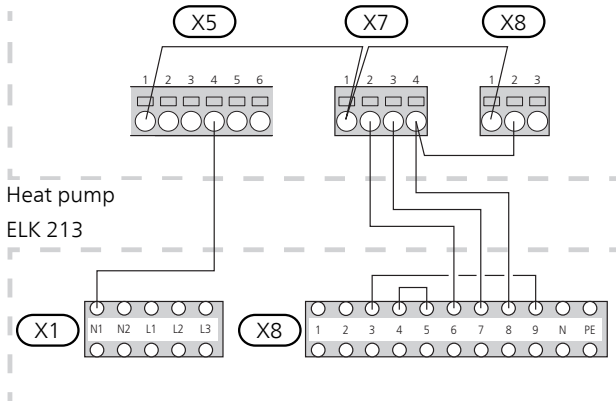
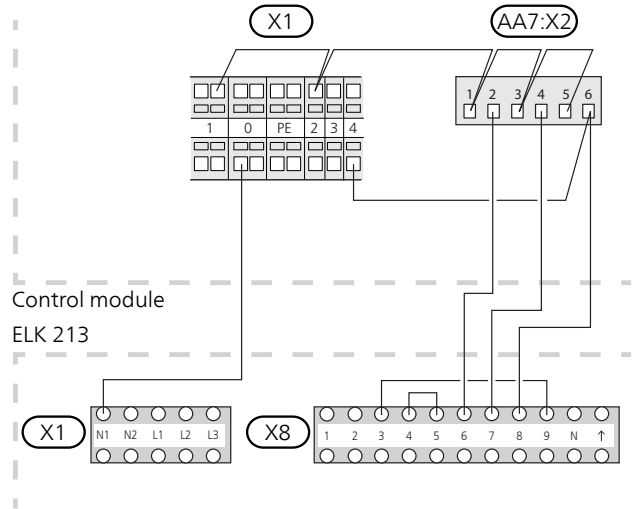


F1345 with 2.0/F1355

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.



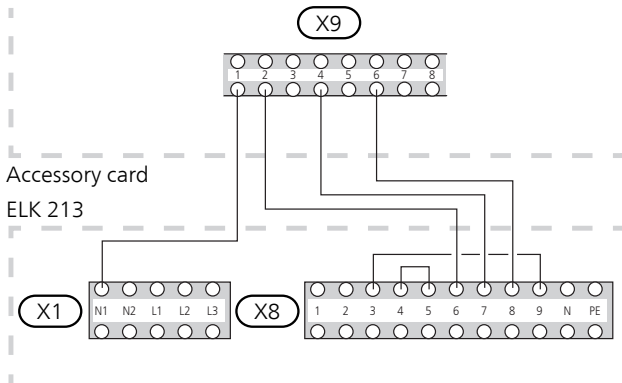
SMO 20 and SMO 40



F1145 and F1155

To connect ELK 213 to F1145, the AXC 40 accessory is required.

Terminal blocks X1 and X8 in ELK 213 connect to terminal block 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.

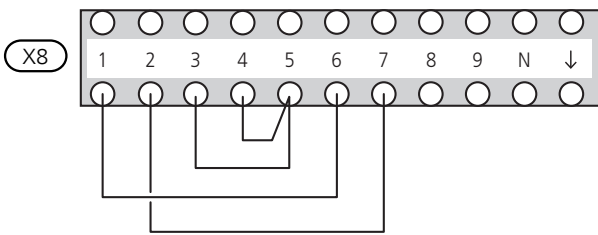
Output

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

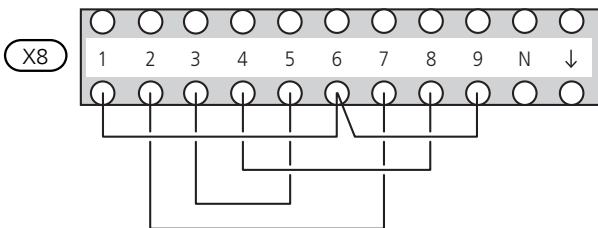
The immersion heater power output is divided into steps, 7, 9, 11 and 13 kW. Connection to another power output is made at the top of the water heater, directly on the immersion heater's connections and on terminal block (X8) in the electrical connection.

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.

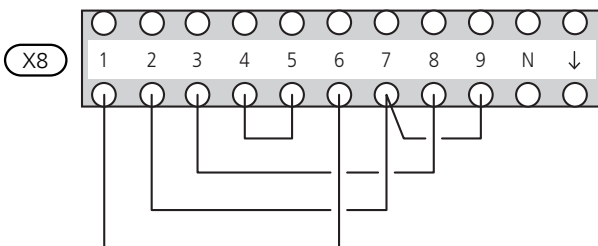
9 kW in two steps (delivery setting)



7/9 kW in three steps



11/13 kW in three steps



Controlling the immersion heater



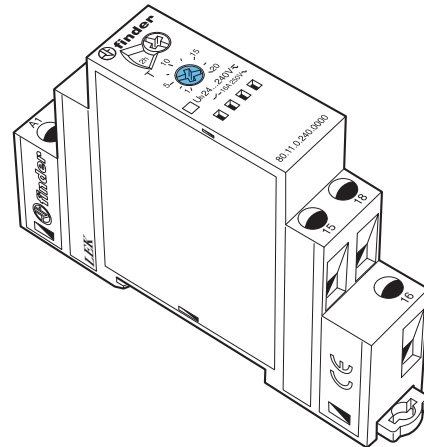
NOTE

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.

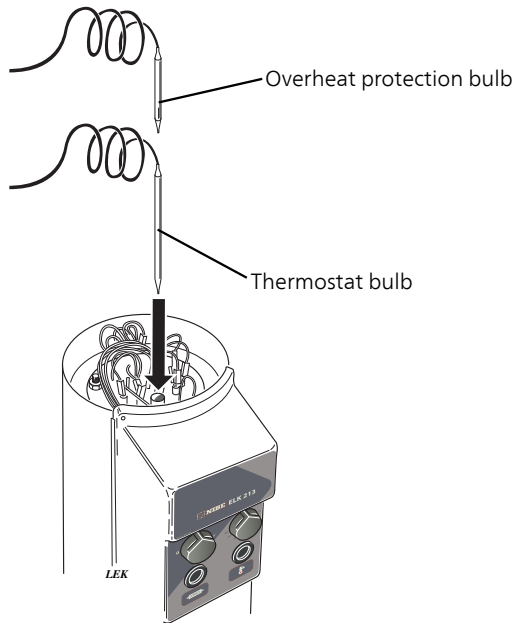
Set output (kW)	Power step (kW)
7	1, 2, 4
9	2, 3, 4
11	1, 4, 6
13	3, 4, 6

Time relay

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



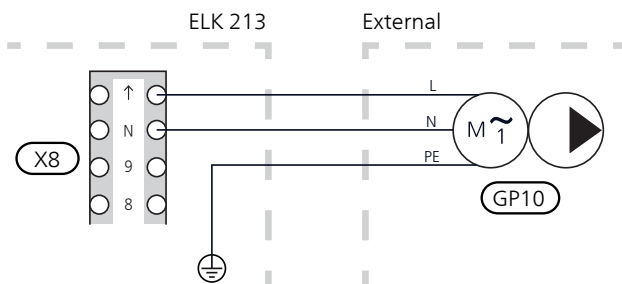
Sensors



1. Install the thermostat bulb (long).
2. Install the overheat protection bulb (short).

Connection of the circulation pump (GP10)

Connect the cable for any circulation pump fitted to terminal block (X8), fused with miniature circuit breaker (FA1) on 10 A and routed through separate strain-relief.



6 Activating ELK 213

This section describes how to activate ELK 213 in installations together with a heat pump.

The menu setting of ELK 213 can be performed via the start guide or directly in the menu system.



Caution

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

Start guide

The start guide appears upon first start-up after heat pump installation, but is also found in menu 5.7.

Menu system

F1345, F1355, SMO 20 and SMO 40

Menu 4.9.3 - degree minute setting

Select when the addition is to start.

Menu 5.1.12 - addition

Setting:

- Max. number of permitted additional steps
- If binary stepping is to be used.



Caution

Linear stepping of ELK 213 is recommended.

F1145 and F1155

Information about menu settings for the products above can be found in the manual for AXC 40.

See the "Compatible products" section on page 5 to see which accessory is required for your product.

7 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 (FA1) has deployed.
- The overheat protection (FD1) has tripped. If the overheat protection has tripped, the function of the system's circulation pumps and valves must be checked. To reset, press the button on the overheat protection when the temperature has fallen below 80°C.
- Circulation pump has stopped.
- Air in boiler or system.
- The pressure is too low in the expansion vessel.
- The load monitor or some external control unit may have blocked the power output.

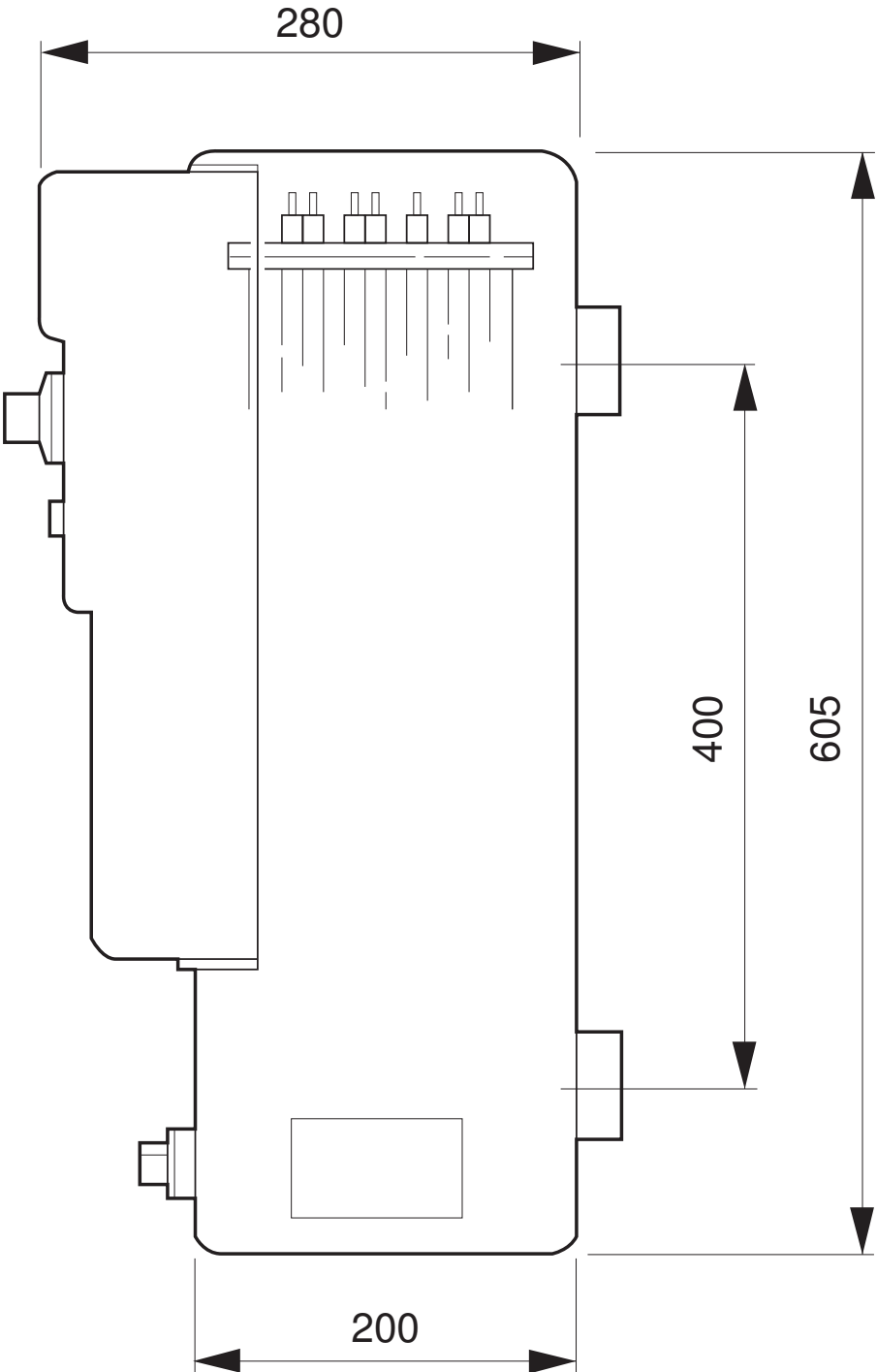
Poor circulation

- Circulation pump, if fitted is stationary.

8 Technical data

Dimensions

All dimensions in mm.



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		
Part No.		069 500

Energy labelling

Information sheet

Supplier		NIBE
Model		ELK 213
Energy efficiency class for space heating		D
Rated heat output (P _{designh})	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

Technical documentation

Model		ELK 213					
Condensing boiler	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Low-temperature boiler	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
B11 boiler	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Cogeneration space heater	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Combination heater	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Rated heat output	Prated	9	kW	Seasonal space heating energy efficiency	η_s	36.6	%
<i>For boiler space heaters and boiler combination heaters: Useful heat output</i>				<i>For boiler space heaters and boiler combination heaters: Useful efficiency</i>			
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		%
<i>Auxiliary electricity consumption</i>				<i>Other items</i>			
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
<i>For combination heaters</i>							
Declared load profile for water heating				Water heating energy efficiency			
Daily energy consumption	Q _{elec}		kWh	Daily fuel consumption	Q _{fuel}		kWh
Annual energy consumption	AEC		kWh	Annual fuel consumption	AFC		GJ

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Item register

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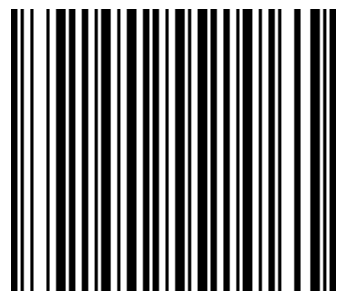
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Contact information

- AT** **KNV Energietechnik GmbH**, Gahberggasse 11, AT-4861 Schörfling
Tel: +43 (0)7662 8963 E-mail: mail@knv.at www.knv.at
- CH** **NIBE Wärmetechnik c/o ait Schweiz AG**, Industriepark, CH-6246 Altishofen
Tel: +41 58 252 21 00 E-mail: info@nibe.ch www.nibe.ch
- CZ** **Druzstevni zavody Drazice s.r.o.**, Drazice 69, CZ - 294 71 Benátky nad Jizerou
Tel: +420 326 373 801 E-mail: nibe@nibe.cz www.nibe.cz
- DE** **NIBE Systemtechnik GmbH**, Am Reiherpfahl 3, 29223 Celle
Tel: +49 (0)5141 7546-0 E-mail: info@nibe.de www.nibe.de
- DK** **Vølund Varmeteknik A/S**, Member of the Nibe Group, Brogårdsvej 7, 6920 Videbæk
Tel: +45 97 17 20 33 E-mail: info@volundvt.dk www.volundvt.dk
- FI** **NIBE Energy Systems OY**, Juurakkotie 3, 01510 Vantaa
Tel: +358 (0)9-274 6970 E-mail: info@nibe.fi www.nibe.fi
- FR** **NIBE Energy Systems France Sarl**, Zone industrielle RD 28, Rue du Pou du Ciel, 01600 Reyrieux
Tel : 04 74 00 92 92 E-mail: info@nibe.fr www.nibe.fr
- GB** **NIBE Energy Systems Ltd**, 3C Broom Business Park, Bridge Way, S419QG Chesterfield
Tel: +44 (0)845 095 1200 E-mail: info@nibe.co.uk www.nibe.co.uk
- NL** **NIBE Energietechnik B.V.**, Postbus 634, NL 4900 AP Oosterhout
Tel: 0168 477722 E-mail: info@nibenl.nl www.nibenl.nl
- NO** **ABK AS**, Brobekkveien 80, 0582 Oslo, Postadresse: Postboks 64 Vollebekk, 0516 Oslo
Tel: +47 23 17 05 20 E-mail: post@abkklima.no www.nibeenergysystems.no
- PL** **NIBE-BIAWAR Sp. z o. o.** Aleja Jana Pawła II 57, 15-703 BIALYSTOK
Tel: +48 (0)85 662 84 90 E-mail: sekretariat@biawar.com.pl www.biawar.com.pl
- RU** © "EVAN" 17, per. Boynovskiy, RU-603024 Nizhny Novgorod
Tel: +7 831 419 57 06 E-mail: kuzmin@evan.ru www.nibe-evan.ru
- SE** **NIBE AB Sweden**, Box 14, Hannabadsvägen 5, SE-285 21 Markaryd
Tel: +46 (0)433 73 000 E-mail: info@nibe.se www.nibe.se

For countries not mention in this list, please contact Nibe Sweden or check www.nibe.eu for more information.

NIBE AB Sweden
Hannabadsvägen 5
Box 14
SE-285 21 Markaryd
info@nibe.se
www.nibe.eu



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