

Installer manual  
**AXC 40**  
Accessories



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# 1 Important information



## **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.

## 2 General

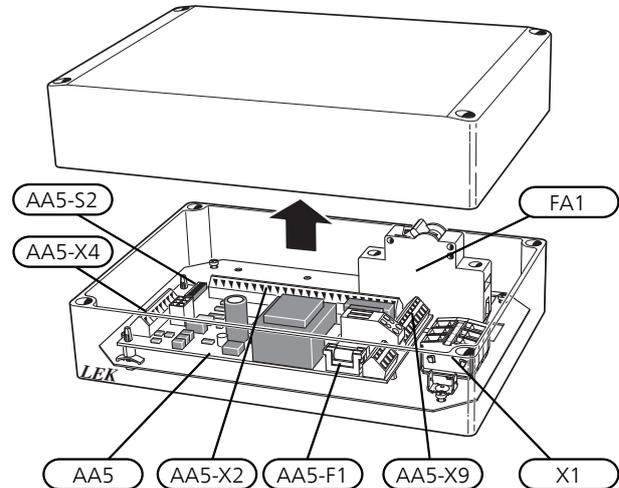
This accessory is used to enable connection and control of (a AXC 40 is required for each of the following accessory functions that is used):

- Shunt controlled additional heat
- Step controlled additional heat
- Pump for hot water circulation
- Groundwater pump

### Contents

4 x	Cable ties
2 x	Heating pipe paste
1 x	Insulation tape
1 x	Unit box with accessory card
2 x	Aluminium tape
2 x	Temperature sensor

### Component location unit box (AA25)



#### Electrical components

FA1	Miniature circuit breaker, 10 A
X1	Terminal block, power supply
AA5	Accessory card
AA5-X2	Terminal block, sensors and external blocking
AA5-X4	Terminal block, communication
AA5-X9	Terminal block, circulation pump, mixing valve and auxiliary relay
AA5-S2	DIP switch
AA5-F1	Fine wire fuse, T4AH250V

Designations in component locations according to standard IEC 81346.

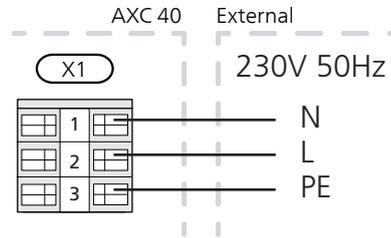
# 3 Common electrical connection

**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 main product must be disconnected from the power supply when installing AXC 40.

Electrical circuit diagrams are at the end of the chapter for each connection option.

## Connecting the supply

Connect the power supply to terminal block X1 as illustrated.



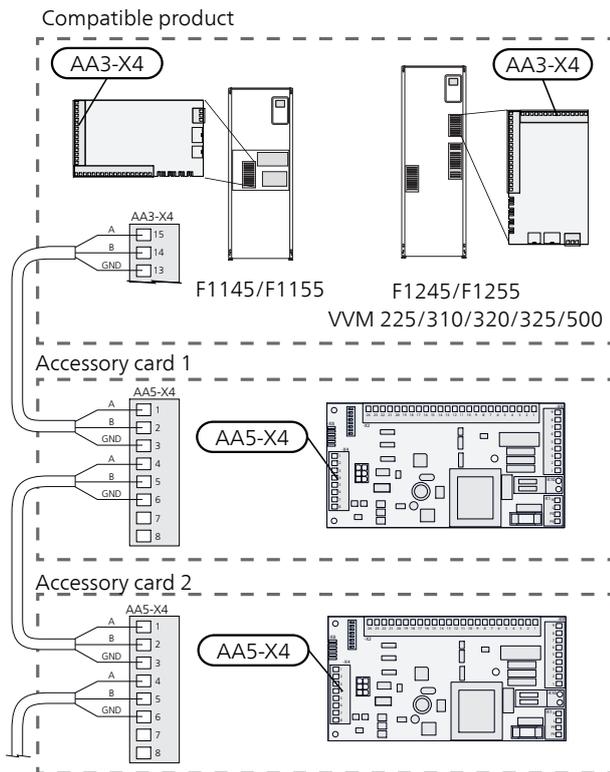
## Connecting communication

This accessory contains an accessory board (AA5) that must be connected directly to the compatible product on the input board (terminal block AA3-X4).

If several accessories are to be connected or are already installed, the following instructions must be followed.

The first accessory board must be connected directly to the terminal block in the compatible product and the following boards must be connected in series with the previous board.

Use cable type LiYY, EKKX or similar.



# 4 Shunt controlled additional heat

## General

This function enables an external additional heater, e.g. an oil boiler, gas boiler or district heating exchanger to aid with heating.

The heat pump controls a shunt valve (QN11) and a circulation pump (GP10) via AXC 40. If the heat pump cannot manage to maintain the correct supply temperature, the additional heat starts. When the boiler temperature has increased to about 55 °C, the heat pump sends a signal to the shunt to open from the additional heat. The shunt is governed so the true supply temperature corresponds with the control system's theoretical calculated set point value. When the heating requirement drops sufficiently, so that the additional heat is no longer required, the shunt closes completely. Factory-set minimum run time for the boiler is 12 hours (can be adjusted in menu 5.3.2).

Prioritised additional heat refers to heating from an external, non-controlled heat source which, if available, is prioritised to be used before the heat pump. An example of prioritised additional heat would be a wood fired boiler or back boiler.

## Compatible products

- F1145
- F1155
- F1245
- F1255
- VVM 225
- VVM 310
- VVM 320
- VVM 325
- VVM 500

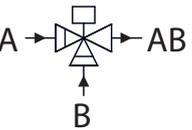
## Pipe connections

The external circulation pump (GP10) is positioned according to the outline diagram.

## Shunt valve

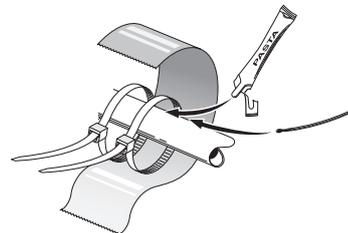
The shunt valve (QN11) must be placed on the supply line to the climate system after the heat pump according to the outline diagram.

- Connect the supply line from the heat pump to the external heat source via the T-pipe to port B on the shunt valve (closes on reduce signal).
- Connect the supply line to the climate system from the shunt valve to the common port AB (always open)
- Connect the supply line from the external additional heat to the shunt valve to port A (opens on increase signal).



## Temperature sensor

- Install the boiler sensor (BT52) in a suitable location in the external additional heat.
- External supply temperature sensor (BT25, connected in the heat pump/indoor module) must be installed on the supply line to the radiators, after the shunt valve (QN11).



Install the temperature sensors using cable ties, together with the heat conducting paste and aluminium tape. Then insulate with the enclosed insulation tape.



### NOTE

Sensor and communication cables must not be placed near power cables.

# Outline diagram

## Explanation

### EB100 Heat pump system

- BT1 Temperature sensor, outdoor
- BT6 Temperature sensor, hot water charging
- BT25 Temperature sensor, heating medium flow, external
- CM1 Expansion vessel, heating medium side
- EB100 Heat pump
- FL2 Safety valve, heating medium side
- GP10 Circulation pump, external
- HQ1 Particle filter
- QM31 - Shut-off valve, heating medium side
- QM32

### EM1 External additional heat

- AA25 Unit box with accessory card (AXC 40)
- BT52 Temperature sensor, boiler

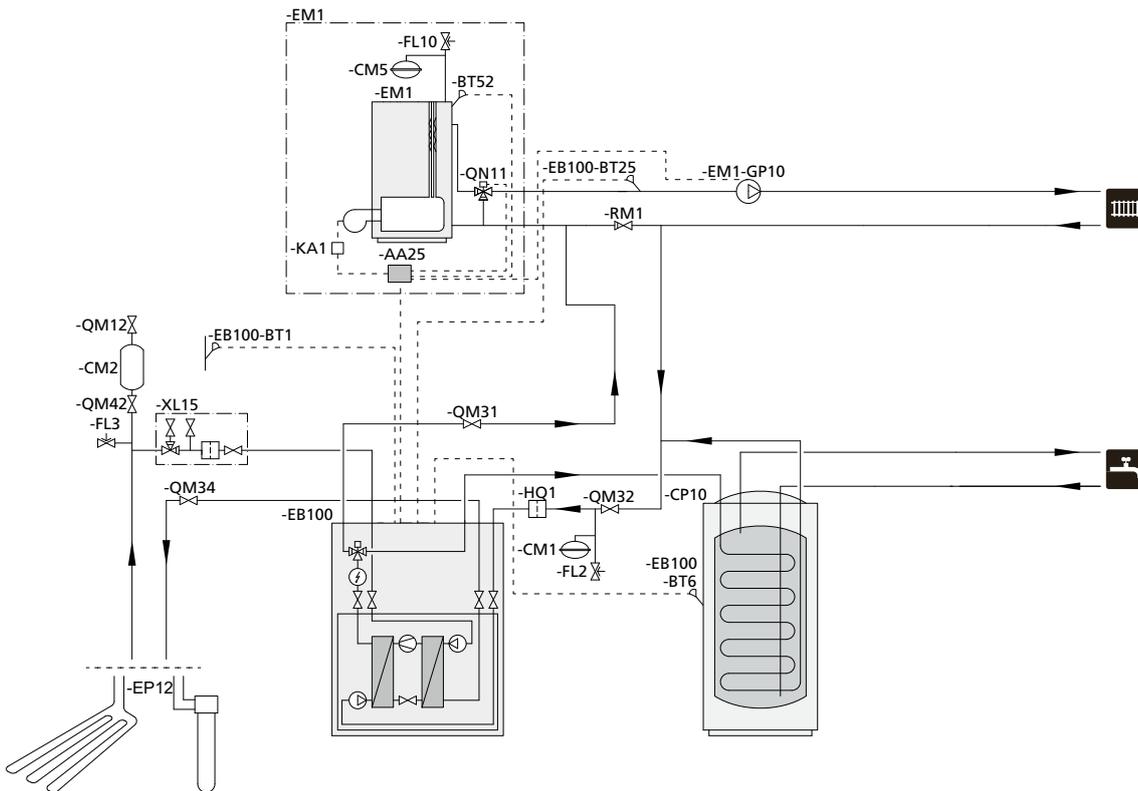
- CM5 Expansion vessel, closed
- EM1 Oil/gas boiler
- FL10 Safety valve, heating medium side
- KA1 Auxiliary relay, external additional heat
- QN11 Mixing valve, addition

### Miscellaneous

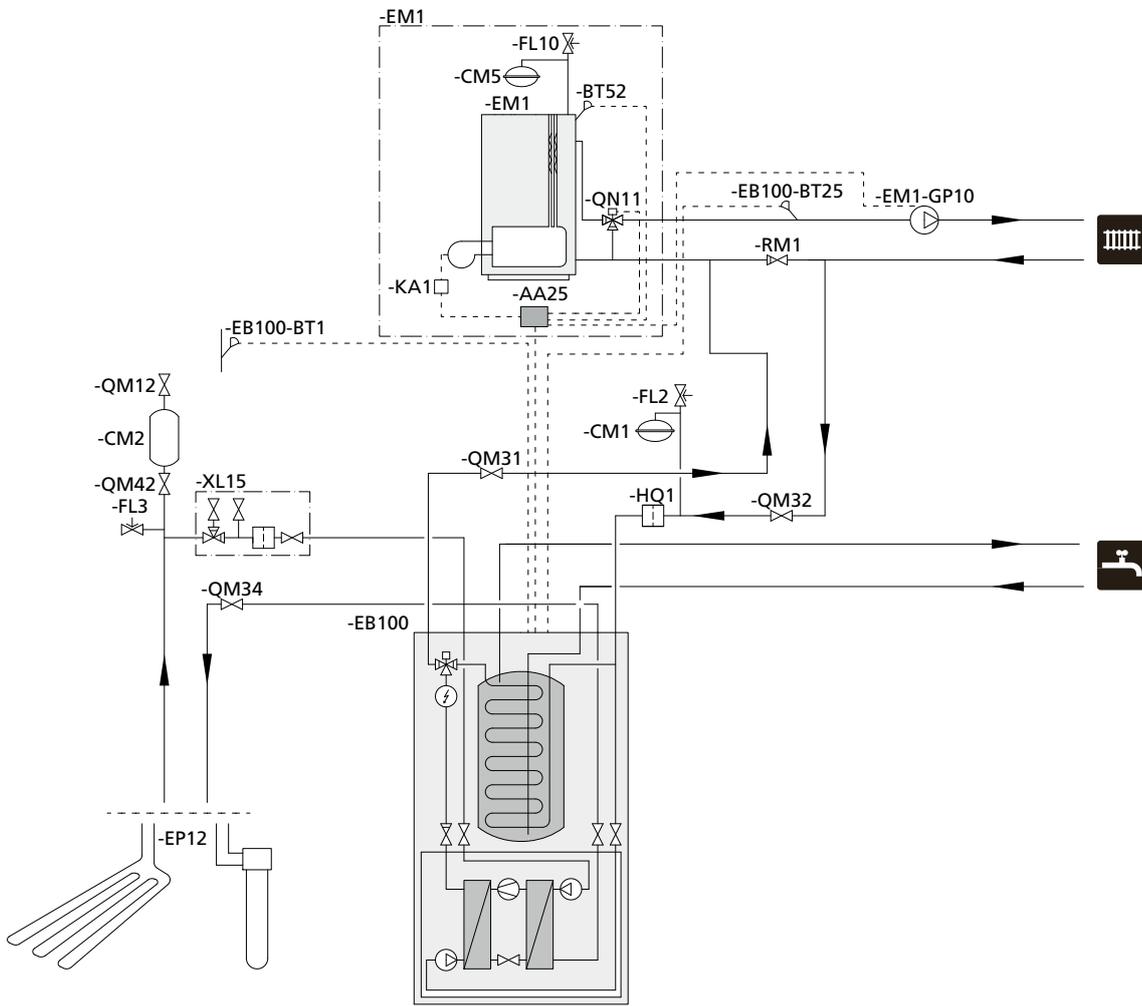
- CM2 Level vessel, collector side
- CP10 Accumulator tank with hot water coil
- EP12 Collector, brine side
- FL3 Safety valve, brine
- QM12 Filler valve
- QM34 Shut off valve, brine return
- QM42 Shut-off valve
- RM1 Non-return valve
- XL15 Connection, filling brine

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

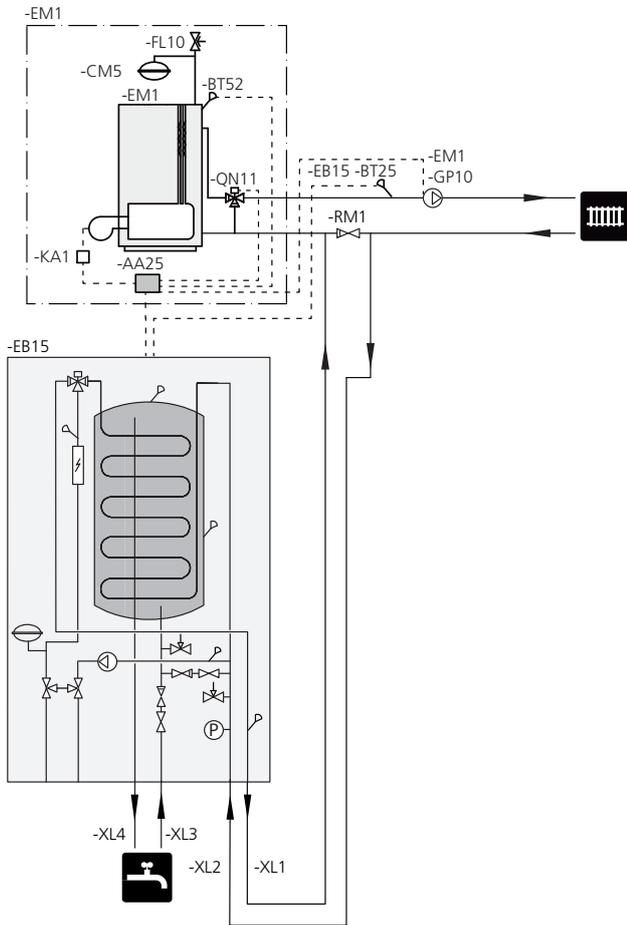
## Outline diagram F1145, F1155 with AXC 40 and shunt-controlled additional heat



**Outline diagram F1245, F1255 with AXC 40 and shunt-controlled additional heat**

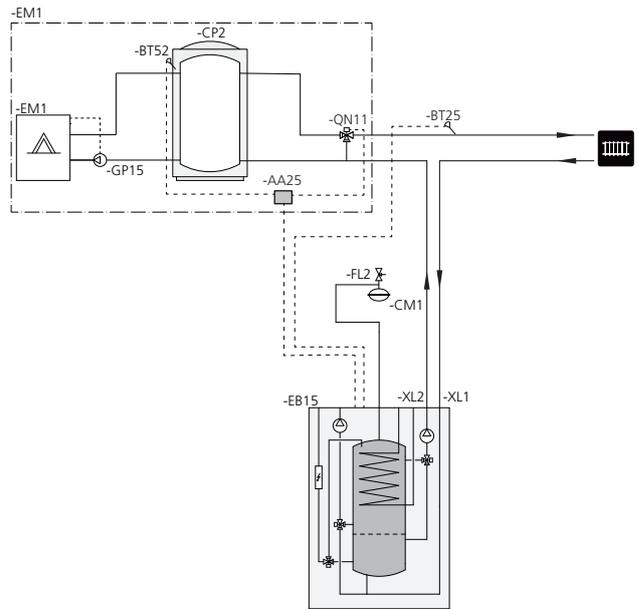


### Outline diagram VVM 225 with AXC 40 and shunt-controlled additional heat

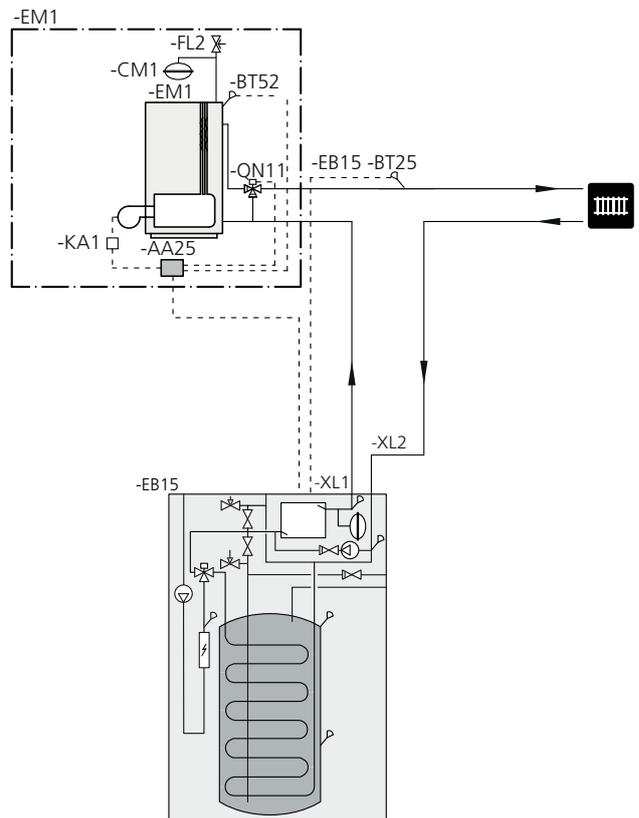


### Outline diagram VVM 310 with AXC 40 and shunt-controlled additional heat

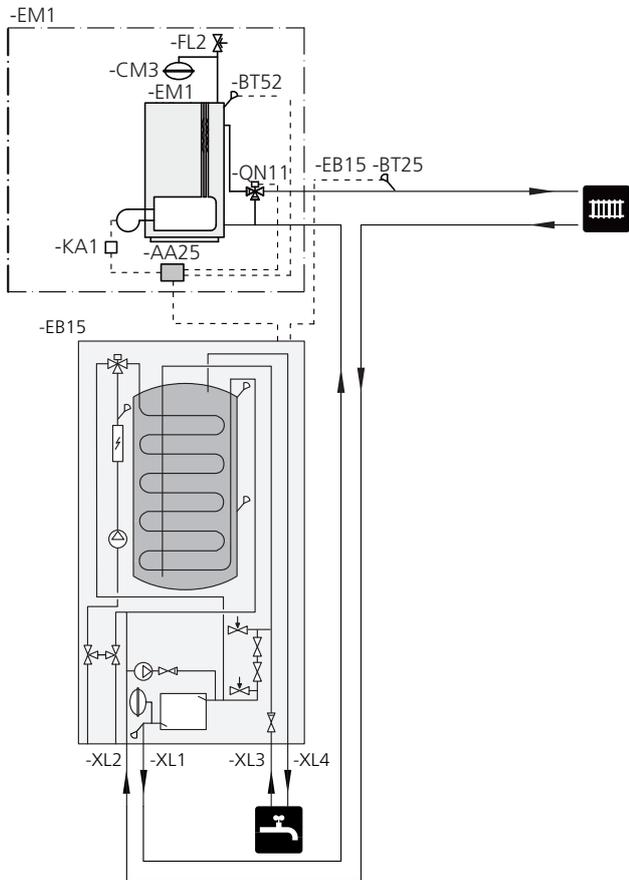
For connection of an external energy source solely to the heating system, suitable when the energy source has a large volume, such as a wood boiler with an accumulator tank. This connection uses the accessory AXC 40. With the following example, the prioritised additional heat function can be used.



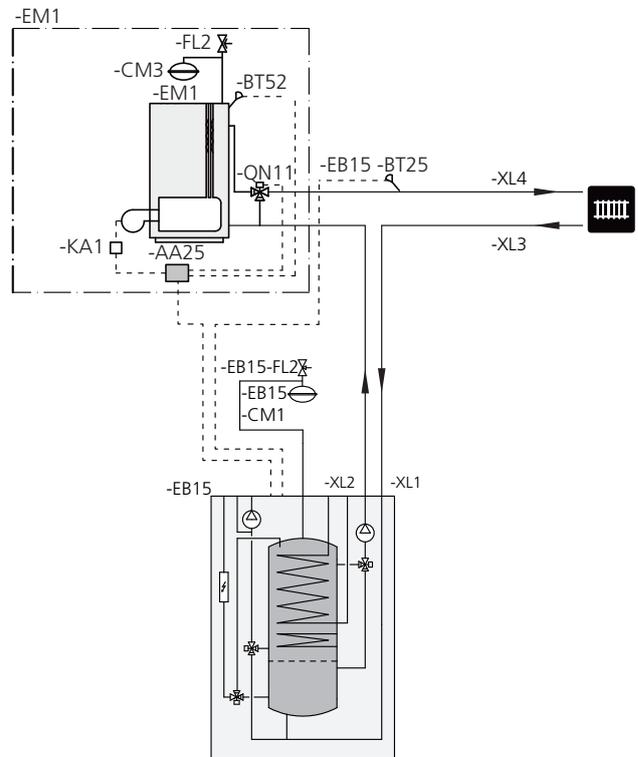
### Outline diagram VVM 320 with AXC 40 and shunt-controlled additional heat



**Outline diagram VVM 325 with AXC 40 and shunt-controlled additional heat**



**Outline diagram VVM 500 with AXC 40 and shunt-controlled additional heat**

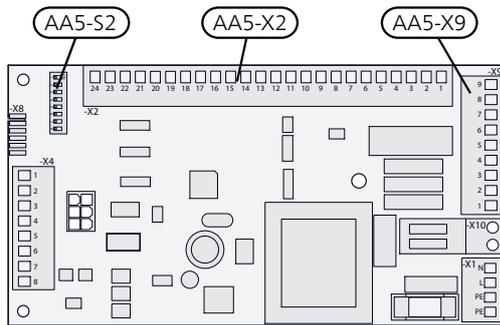


## Electrical connection

### 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 main product must be disconnected from the power supply when installing AXC 40.

### Overview accessory board (AA5)



### Connection of sensors and external blocking

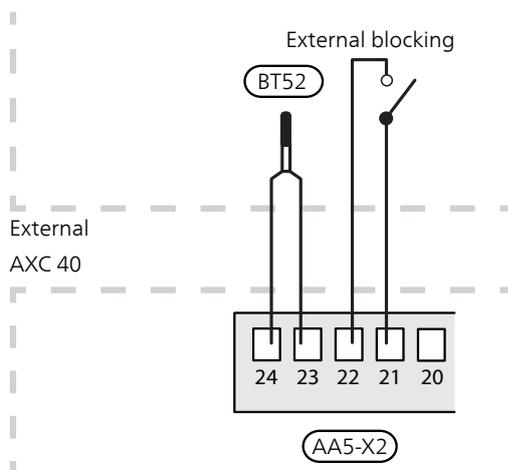
Use cable type LiYY, EKKX or similar.

#### Boiler sensor (BT52)

Connect the boiler sensor to AA5-X2:23-24.

#### External blocking (optional)

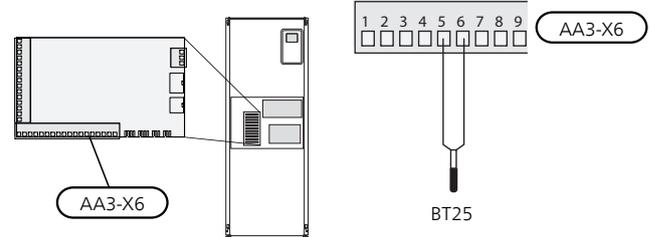
A contact (NO) can be connected to AA5-X2:21-22 to block the additional heat. When the contact closes, the additional heat is blocked.



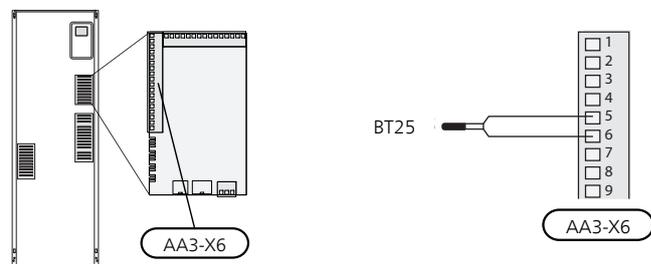
### External supply temperature sensor (BT25)

Connect the supply temperature sensor to AA3-X6:5-6 on the input board in the heat pump.

#### F1145, F1155



#### F1245, F1255, VVM 225, VVM 310, VVM 320, VVM 325, VVM 500

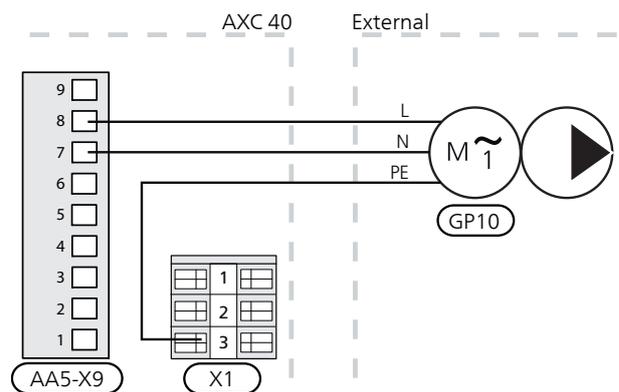


### Caution

The relay outputs on the accessory board can have a max load of 2A (230V) in total.

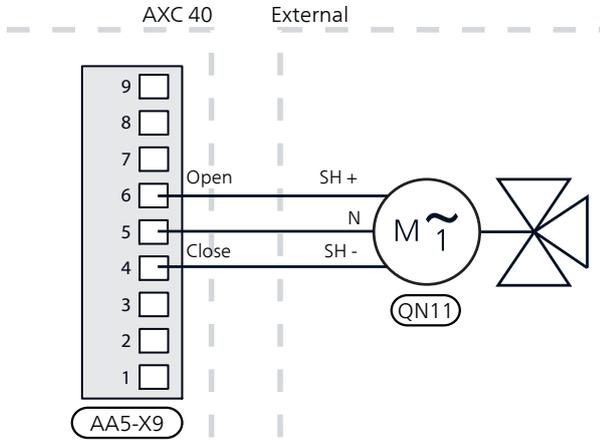
### Connection of the circulation pump (GP10)

Connect the circulation pump (GP10) to AA5-X9:8 (230V), AA5-X9:7 (N) and X1:3 (PE)



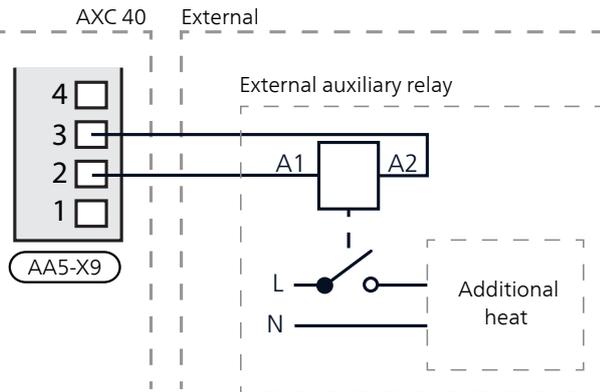
## Connection of the shunt valve motor (QN11)

Connect the shunt motor (QN11) to AA5-X9:6 (230V, open), AA5-X9:5 (N) and AA5-X9:4 (230V, close).



## Connection of the auxiliary relay for additional heating

Connect the auxiliary relay for switching the additional heat on and off to AA5-X9:2 (230V) and AA5-X9:3 (N).



## DIP switch

The DIP switch (S2) on the accessory card (AA5) must be set as follows.



## Program settings

Program setting of AXC 40 can be performed via the start guide or directly in the menu system.

### Start guide

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

### Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

#### Menu 5.2 - system settings

Activating/deactivating of accessories.

Select: "shunt controlled add. heat".

#### Menu 5.3.2 - shunt controlled add. heat

Here you can perform the following settings:

- Select when the addition is to start.
- Minimum running time.
- Minimum boiler temperature at which the shunt can start control.
- Misc. shunt settings.



#### Caution

"start addition" in the menus 5.3.2 (external) and 4.9.3 (internal) are factory set at 400GM. If both additional heat possibilities are used and you wish one to start before the other the start difference must be changed in one of the menus.

#### Menu 5.6 - forced control

Forced control of the different components in heat pump

EM1-AA5-K1: Activating the relay for extra heating

EM1-AA5-K2: Signal (close) to mixing valve (QN11).

EM1-AA5-K3: Signal (open) to mixing valve (QN11).

EM1-AA5-K4: Activating the circulation pump (GP10).



#### Caution

Also see the Installer manual for the heat pump/indoor module.



# 5 Step controlled additional heat

## General

With AXC 40 a further three potential-free relays are used for additional heat control, which then gives max 3 linear or 7 binary steps.

### Compatible products

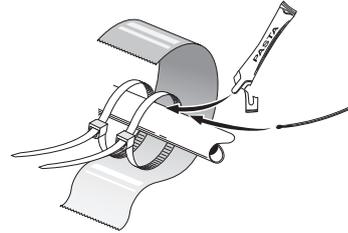
- F1145
- F1155
- F1245
- F1255
- VVM 225
- VVM 320
- VVM 325

## Pipe connections

The extra circulation pump (GP10) is positioned according to the outline diagram.

### Temperature sensor

- External supply temperature sensor (BT25, connected in the heat pump/indoor module) must be installed on the supply line to the radiators, after the additional heat.



Install the temperature sensors with cable ties with the heat conducting paste and aluminium tape. Then insulate with supplied insulation tape.



#### NOTE

- Sensor and communication cables must not be placed near power cables.

# Outline diagram

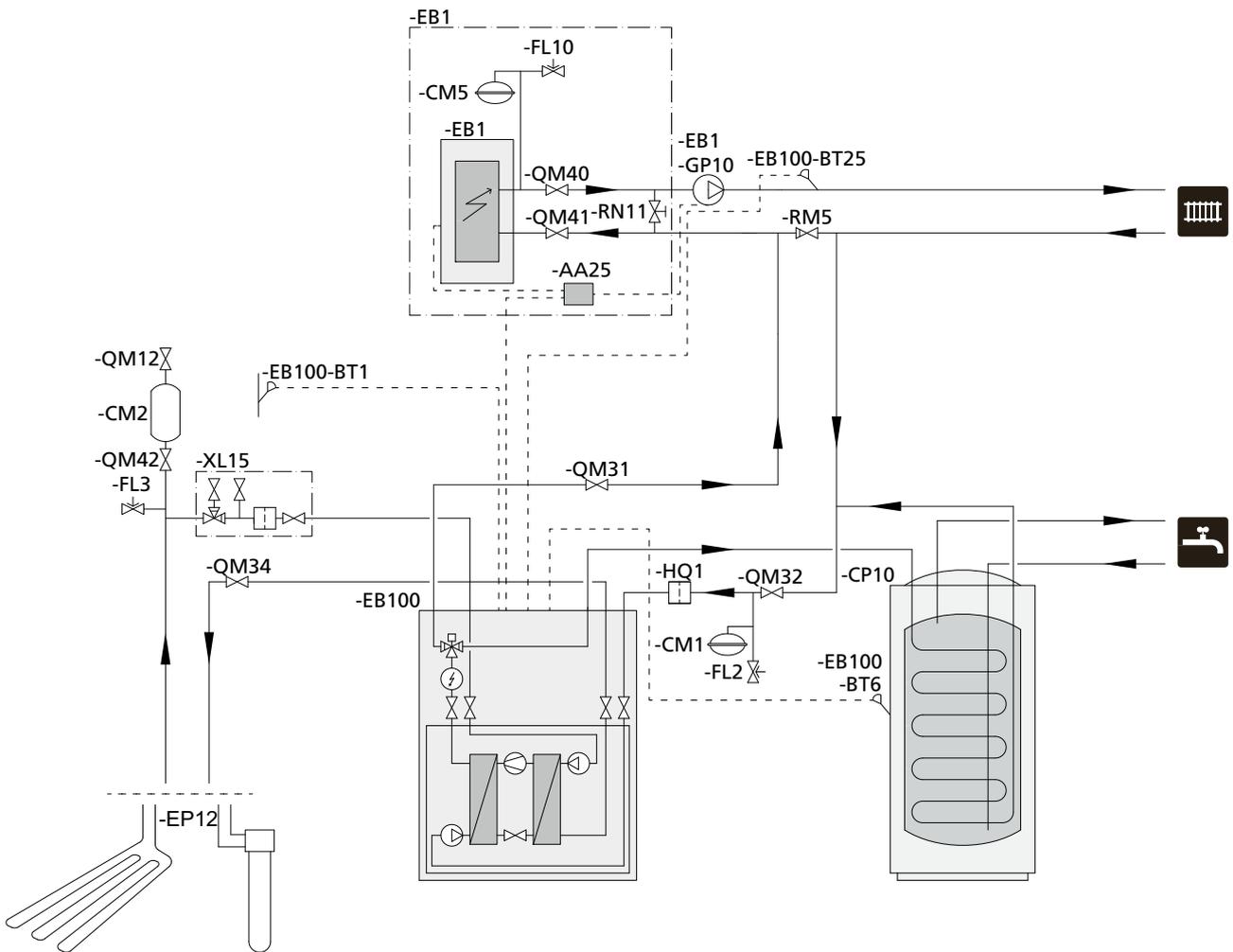
## Explanation

<b>EB1</b>	<b>External additional heat</b>
AA25	Unit box with accessory card (AXC 40)
CM5	Expansion vessel, closed
EB1	External electrical additional heat
FL10	Safety valve, heating medium side
QM40 - QM41	Shut-off valve, heating medium side
RN11	Trim valve
<b>EB100</b>	<b>Heat pump system</b>
BT1	Temperature sensor, outdoor
BT6	Temperature sensor, hot water charging
BT25	Temperature sensor, heating medium flow, external
CM1	Expansion vessel, heating medium side
EB100	Heat pump
FL2	Safety valve, heating medium side

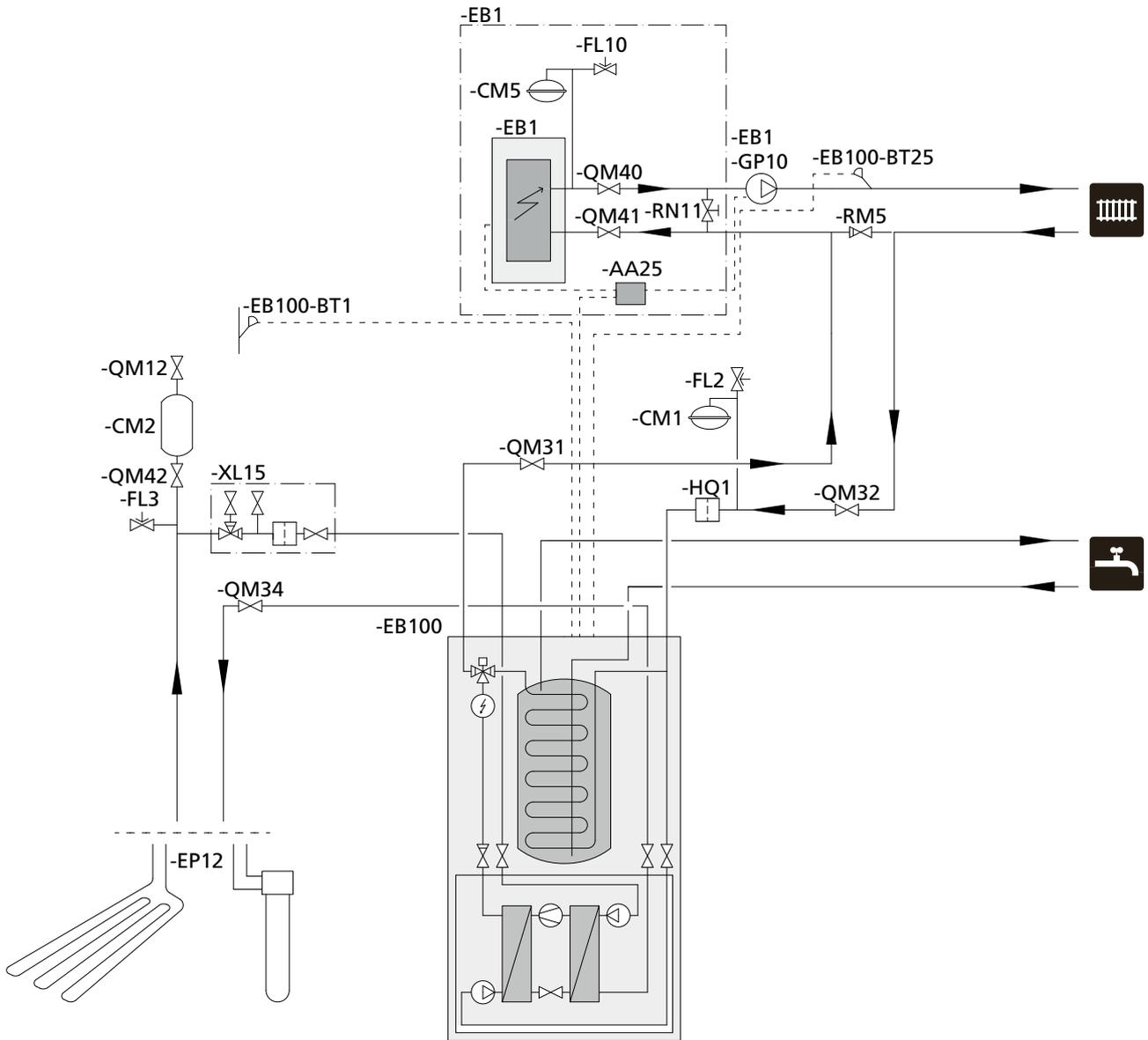
GP10	Circulation pump, external
HQ1	Particle filter
QM31 - QM32	Shut-off valve, heating medium side
<b>Miscellaneous</b>	
CM2	Level vessel, collector side
CP10	Accumulator tank with hot water coil
EP12	Collector, brine side
FL3	Safety valve, brine
QM12	Filler valve
QM34	Shut off valve, brine return
QM42	Shut-off valve
RM5	Non-return valve
XL15	Connection, filling brine

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

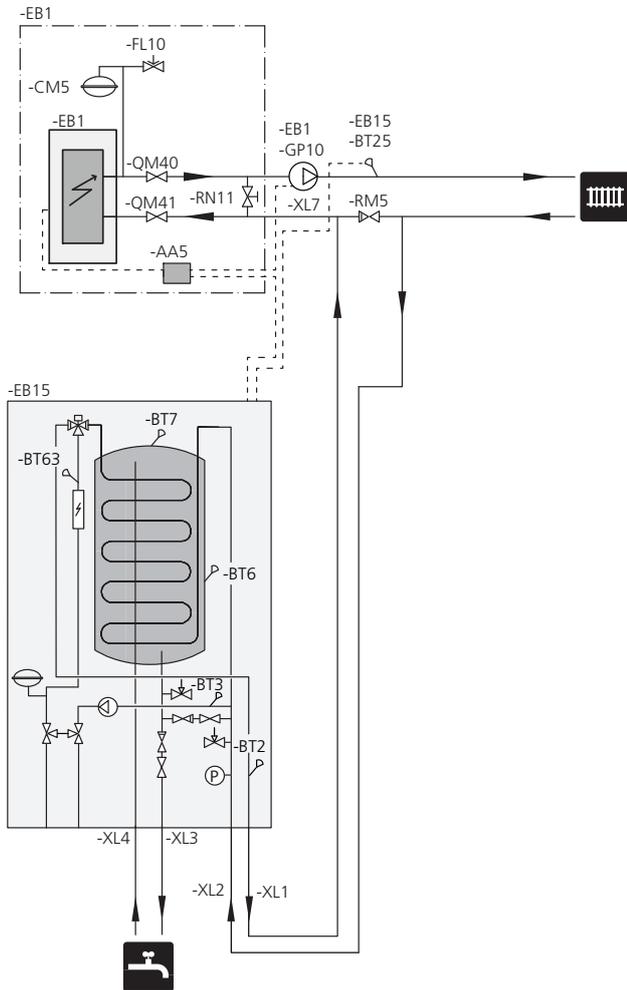
## Outline diagram F1145, F1155 with AXC 40 and step-controlled additional heat



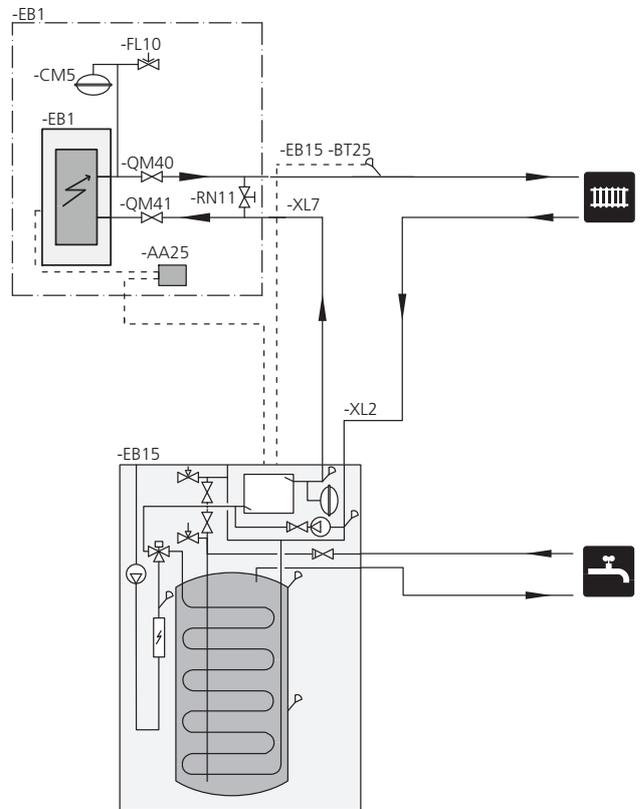
Outline diagram F1245, F1255 with AXC 40 and step-controlled additional heat



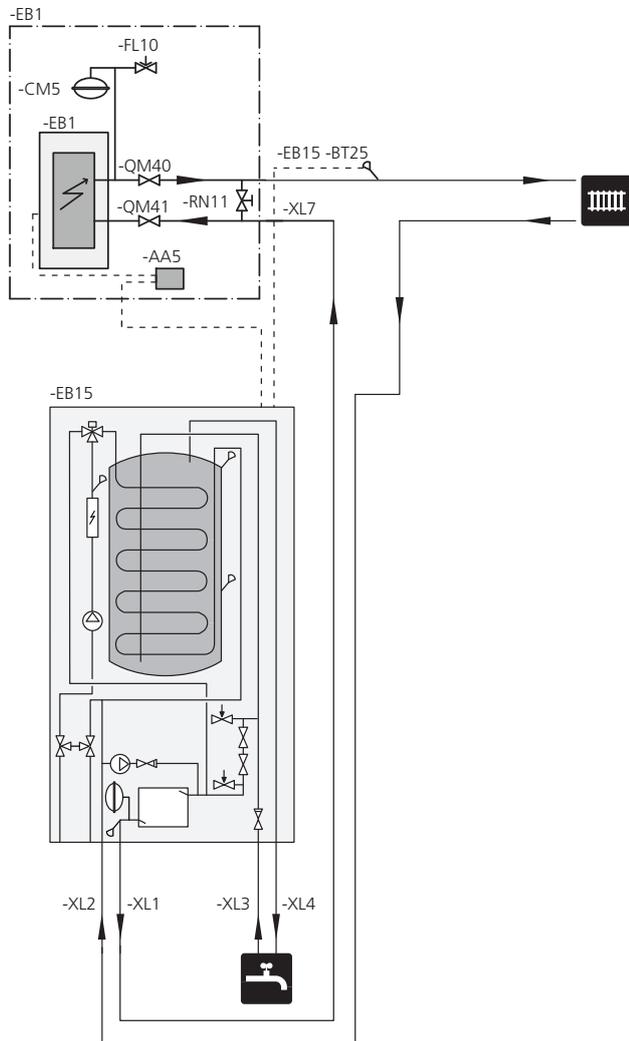
**Outline diagram VVM 225 with AXC 40 and step-controlled additional heat**



**Outline diagram VVM 320 with AXC 40 and step-controlled additional heat**



## Outline diagram VVM 325 with AXC 40 and step-controlled additional heat

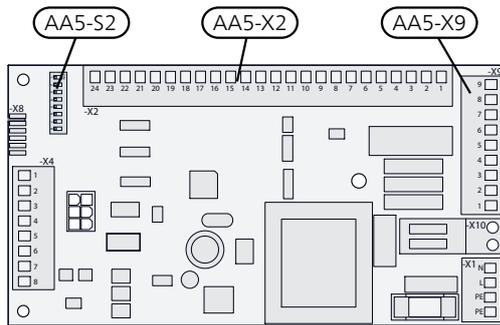


## Electrical connection

### 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 main product must be disconnected from the power supply when installing AXC 40.

### Overview accessory board (AA5)

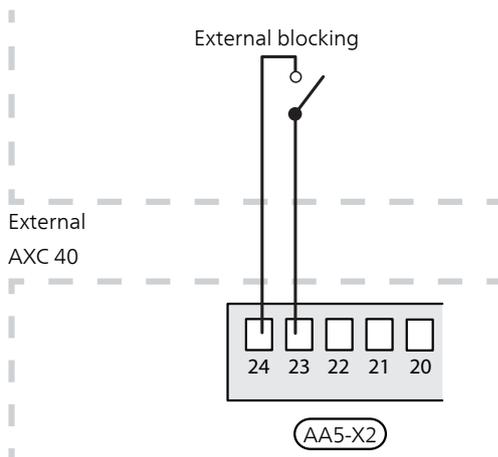


### Connection of sensors and external blocking

Use cable type LiYY, EKKX or similar.

#### External blocking (optional)

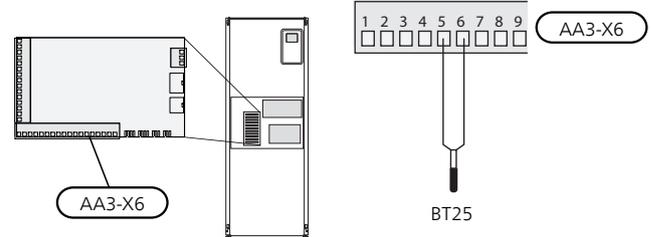
A contact (NO) can be connected to AA5-X2:23-24 to block the additional heat. When the contact closes, the additional heat is blocked.



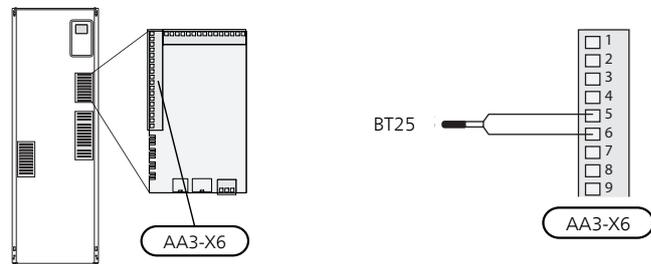
### External supply temperature sensor (BT25)

Connect the supply temperature sensor to AA3-X6:5-6 on the input board in the heat pump.

#### F1145, F1155



#### F1245, F1255, VVM 225, VVM 320, VVM 325

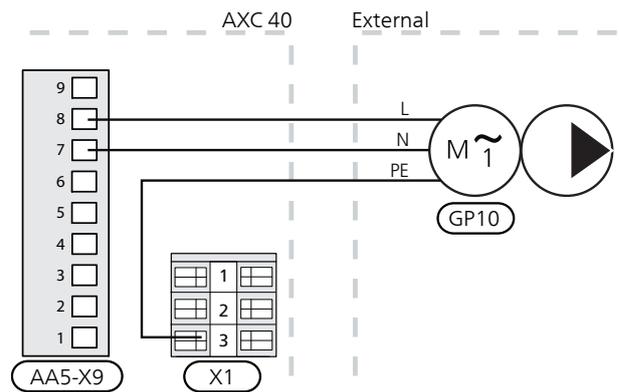


### Caution

The relay outputs on the accessory board can have a max load of 2A (230V) in total.

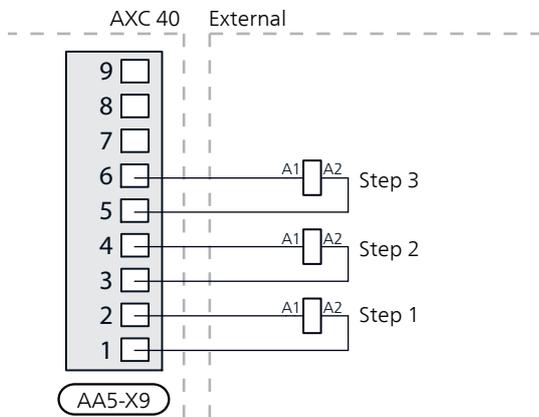
### Connection of the circulation pump (GP10)

Connect the circulation pump (GP10) to AA5-X9:8 (230V), AA5-X9:7 (N) and X1:3 (PE)



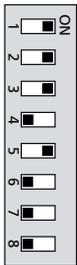
## Connecting additional step

- Connect step 1 to AA5-X9:1 and 2.
- Connect step 2 to AA5-X9:3 and 4.
- Connect step 3 to AA5-X9:5 and 6.



## DIP switch

The DIP switch (S2) on the accessory card (AA5) must be set as follows.



## Program settings

Program setting of AXC 40 can be performed via the start guide or directly in the menu system.

### Start guide

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

### Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

#### 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 addition" in the menus 5.3.6 (external) and 4.9.3 (internal) are factory set at 400GM. If both the additional heat possibilities are used and you wish to have more steps the start difference must 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.

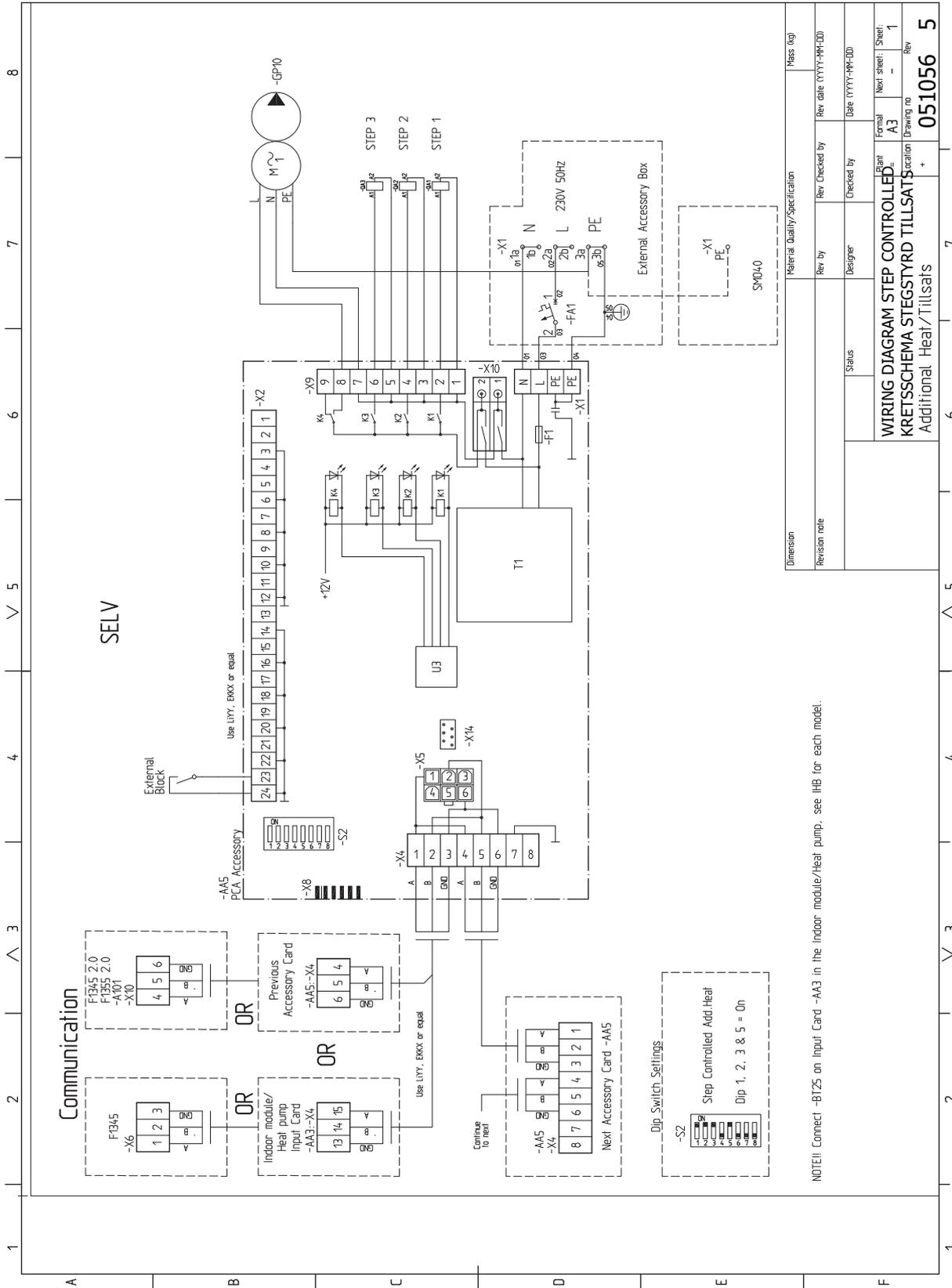
EB1-AA5-K4: Activating the circulation pump (GP10).



#### Caution

Also see the Installer manual for the heat pump/indoor module.

# Electrical circuit diagram



# 6 Hot water circulation

## General

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

### Compatible products

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

## Outline diagram

### Explanation

#### EB100 Heat pump system

- BT1 Temperature sensor, outdoor
- BT6 Temperature sensor, hot water charging
- CM1 Expansion vessel, heating medium side
- EB100 Heat pump

- FL2 Safety valve, heating medium side
- HQ1 Particle filter
- QM31 - QM32 Shut-off valve, heating medium side

#### QZ1

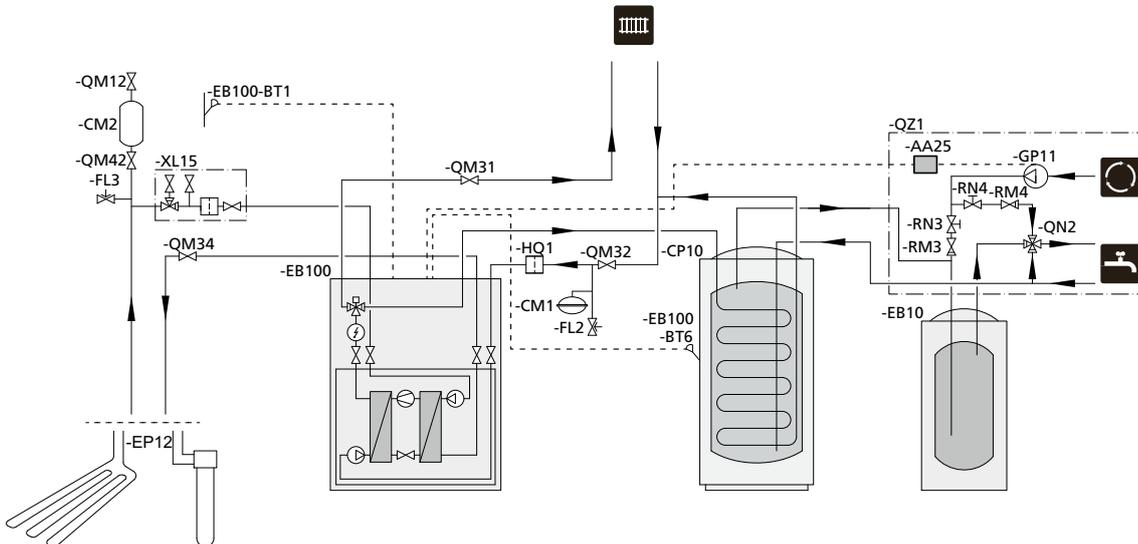
- AA25 Unit box with accessory card (AXC 40)
- GP11 Circulation pump, domestic hot water circulation
- QN2 4-way valve, hot water circulation
- RM2 - RM3 Non-return valve
- RN3 - RN4 Control valve

#### Miscellaneous

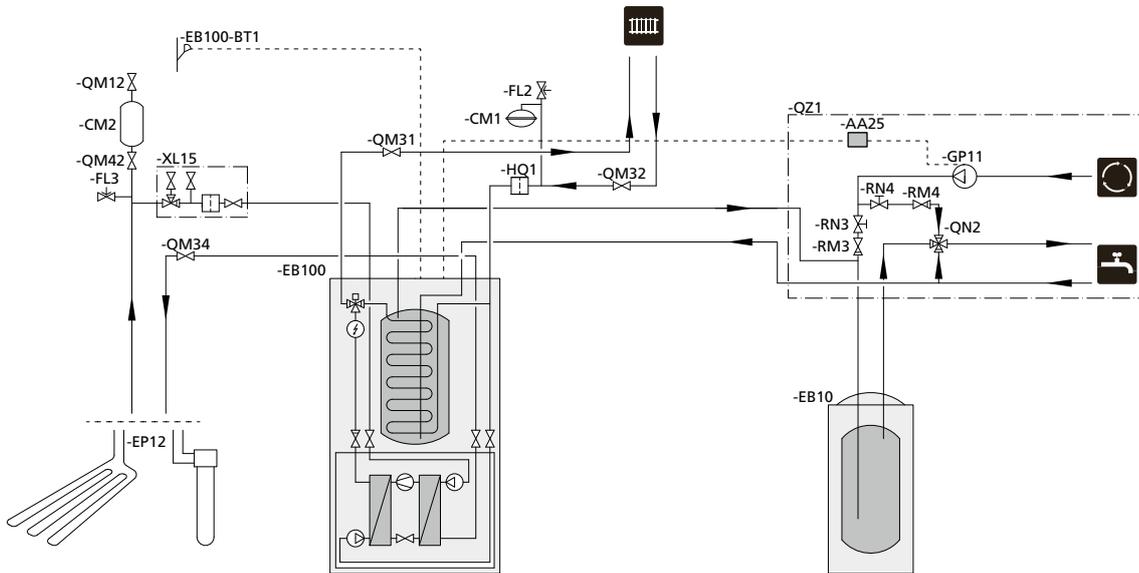
- CM2 Level vessel, collector side
- CP10 Accumulator tank with hot water coil
- EP12 Collector, brine side
- FL3 Safety valve, brine
- QM12 Filler valve
- QM34 Shut off valve, brine return
- QM42 Shut-off valve
- XL15 Connection, filling brine

Designations according to standard IEC 61346-2.

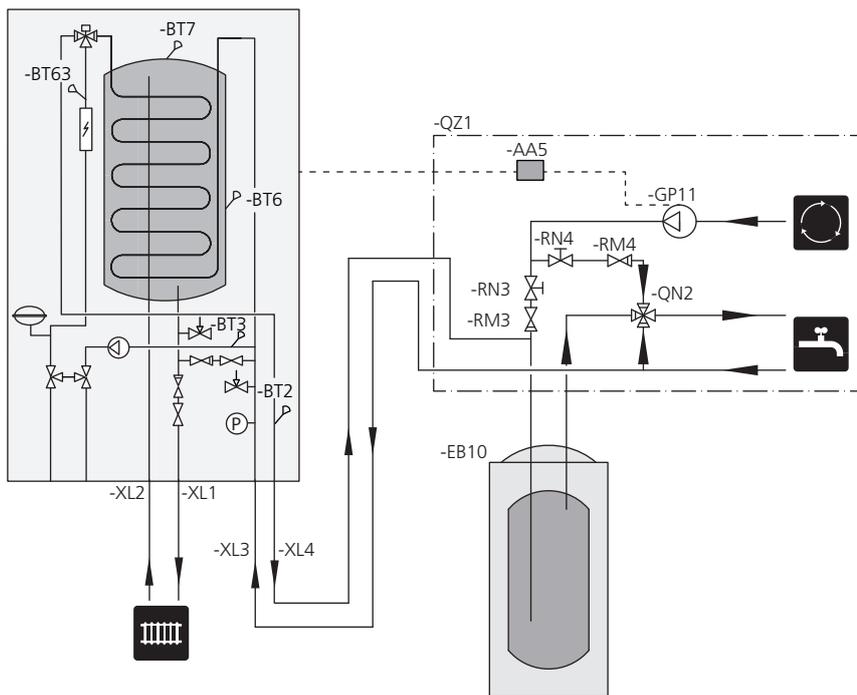
### Outline diagram F1145, F1155 with AXC 40 and hot water circulation



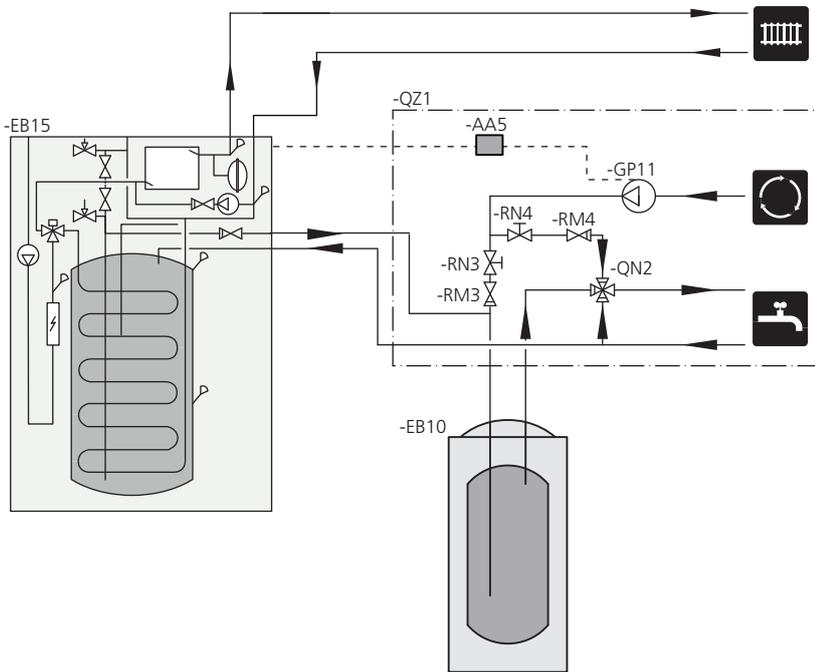
### Outline diagram F1245, F1255 with AXC 40 and hot water circulation



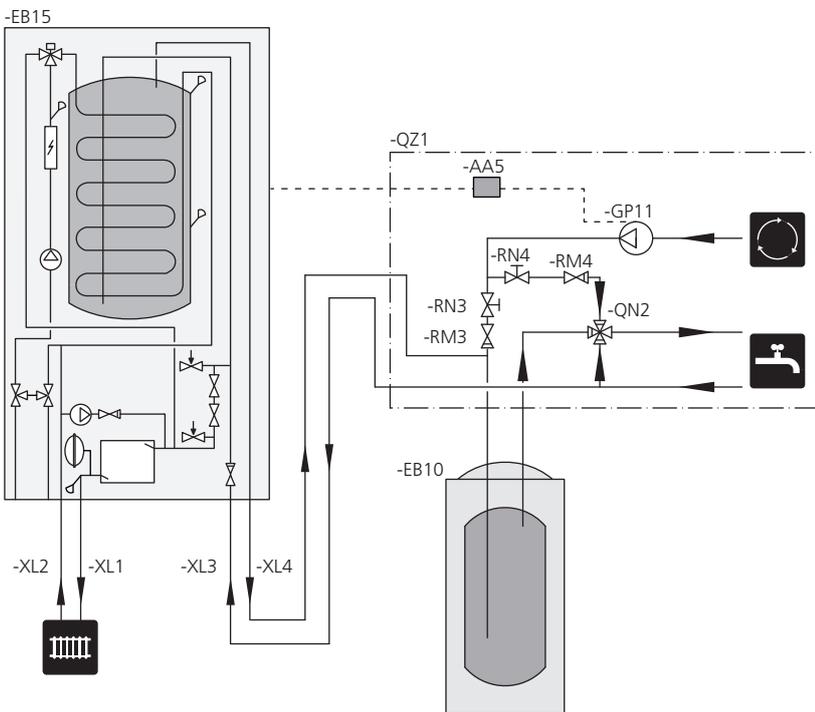
### Outline diagram VVM 225 with AXC 40 and hot water circulation



**Outline diagram VVM 320 with AXC 40 and hot water circulation**



**Outline diagram VVM 325 with AXC 40 and hot water circulation**



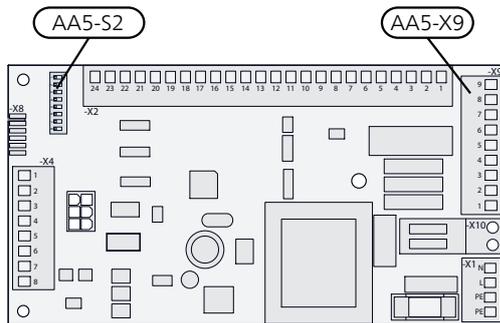
## Electrical connection



### 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 main product must be disconnected from the power supply when installing AXC 40.

### Overview accessory board (AA5)

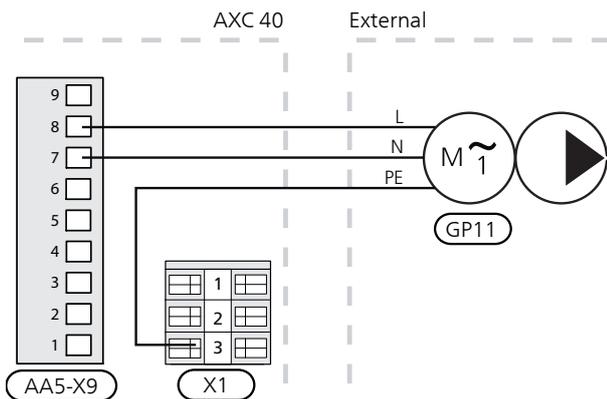


### Caution

The relay outputs on the accessory board can have a max load of 2A (230V) in total.

### Connection of the circulation pump (GP11)

Connect the circulation pump (GP11) to AA5-X9:8 (230V), AA5-X9:7 (N) and X1:3 (PE).



### DIP switch

The DIP switch (S2) on the accessory card (AA5) must be set as follows.



## Program settings

Program setting of AXC 40 can be performed via the start guide or directly in the menu system.

### Start guide

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

### Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

#### Menu 5.2 - system settings

Activating/deactivating of accessories.

Select: "hot water recirc.".

#### Menu 2.9.2 - hot water recirc.

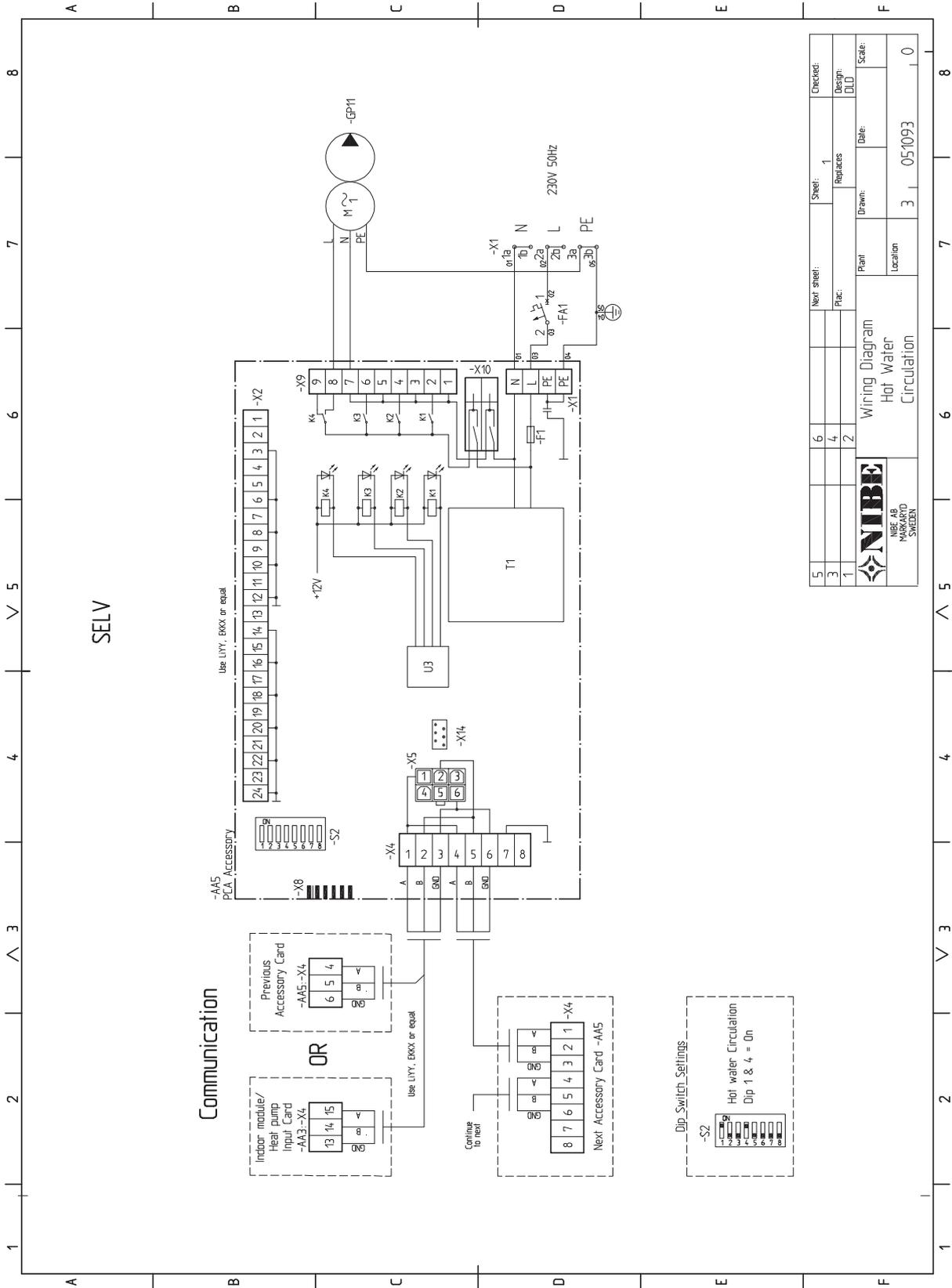
Setting operating time, downtime and period times.



### Caution

Also see the Installer manual for the heat pump/indoor module.

# Electrical circuit diagram



5	Next sheet:	Sheet:	1	Checked:
3	Plac.:	Replaces:		Design:
1				DUU
		Plant:	Drawn:	Date:
		Location:	3	05/093
		Scale:	0	

**NIBE**  
NIBE AB  
MARKARYD  
SWEEN

Wiring Diagram  
Hot Water  
Circulation

# 7 Groundwater pump

## General

With AXC 40 a ground water pump can be connected to the heat pump if the software controlled output (AUX output) is used for something else.

This connection enables the use of ground water as heat source. The ground water is pumped up to an intermediate heat exchanger. An intermediate heat exchanger is used to protect the heat pump's exchanger from dirt and freezing. The water is released into a buried filtration unit or a drilled well.

The ground water pump runs at the same time as the brine pump.

## Compatible products

- F1145
- F1155
- F1245
- F1255

## Outline diagram

### Explanation

#### EB100 Heat pump system

- BT1 Temperature sensor, outdoor
- BT6 Temperature sensor, hot water charging
- BT25 Temperature sensor, heating medium flow, external
- CM1 Expansion vessel, heating medium side
- EB100 Heat pump
- FL2 Safety valve, heating medium side
- GP10 Circulation pump, external
- HQ1 Particle filter
- QM31 - Shut-off valve, heating medium side
- QM32

#### EP12 Collector, brine side, ground water

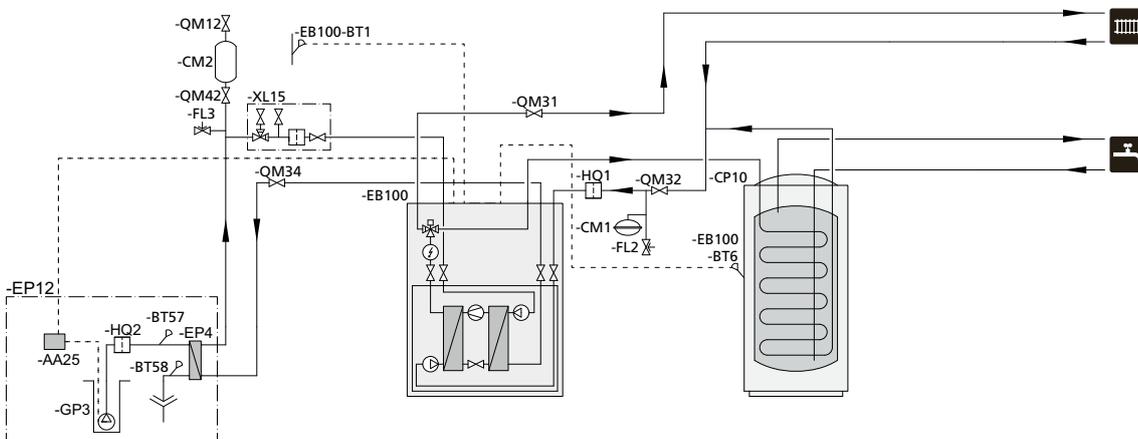
- AA25 Unit box with accessory card (AXC 40)
- EP4 Heat exchanger, groundwater
- GP3 Circulation pump, groundwater
- HQ2 Particle filter
- BT57 Temperature sensor, collector in
- BT58 Temperature sensor, collector out

#### Miscellaneous

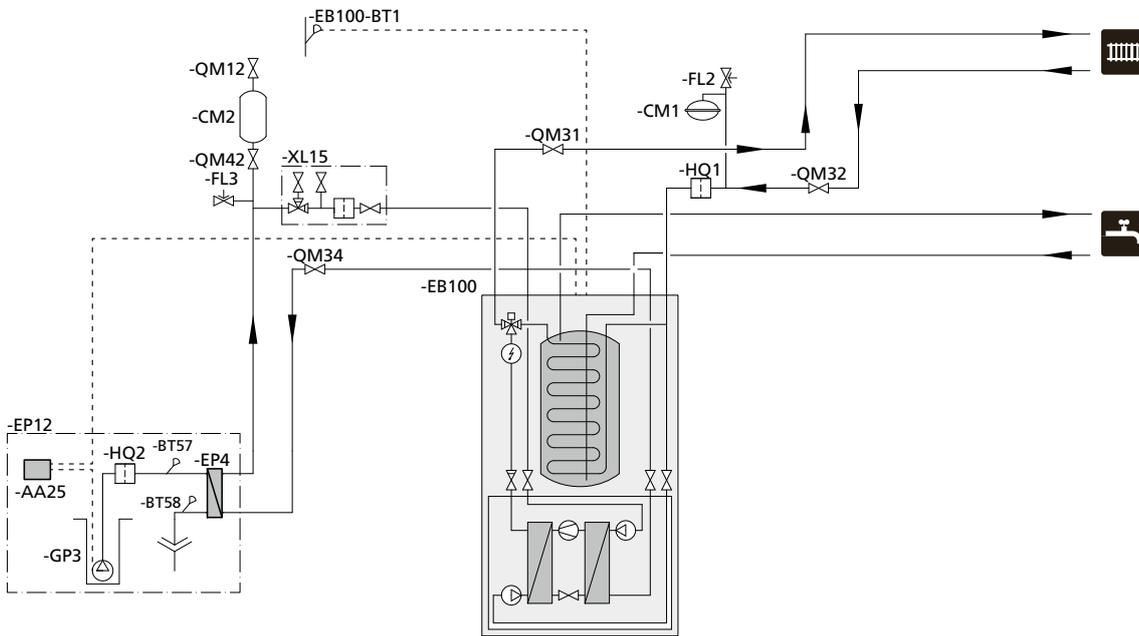
- CM2 Level vessel, collector side
- CP10 Accumulator tank with hot water coil
- FL3 Safety valve, brine
- QM12 Filler valve
- QM34 Shut off valve, brine return
- QM42 Shut-off valve
- RM5 Non-return valve
- XL15 Connection, filling brine

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

## Outline diagram F1145, F1155 with AXC 40 and ground water pump



**Outline diagram F1245, F1255 with AXC 40 and ground water pump**



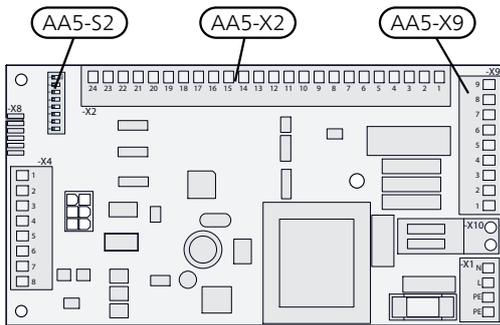
# Electrical connection



**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 main product must be disconnected from the power supply when installing AXC 40.

## Overview accessory board (AA5)

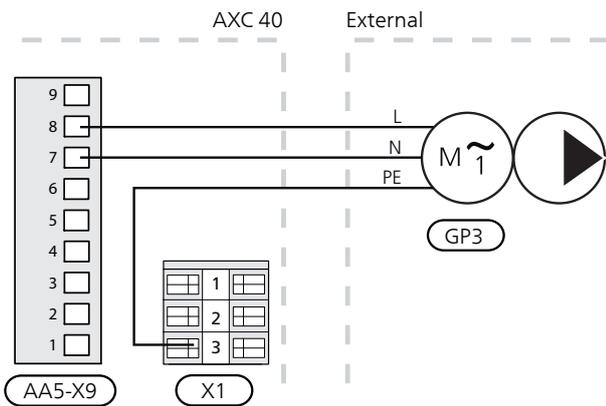


**Caution**

The relay outputs on the accessory board can have a max load of 2A (230V) in total.  
 The auxiliary relay (HR10) requires a greater load than 2A (230V).

## Connecting ground water pump (GP3)

Connect the ground water pump (GP3) to AA5-X9:8 (230V), AA5-X9:7 (N) and X1:3 (PE).



## Connecting sensors BT57 and BT58



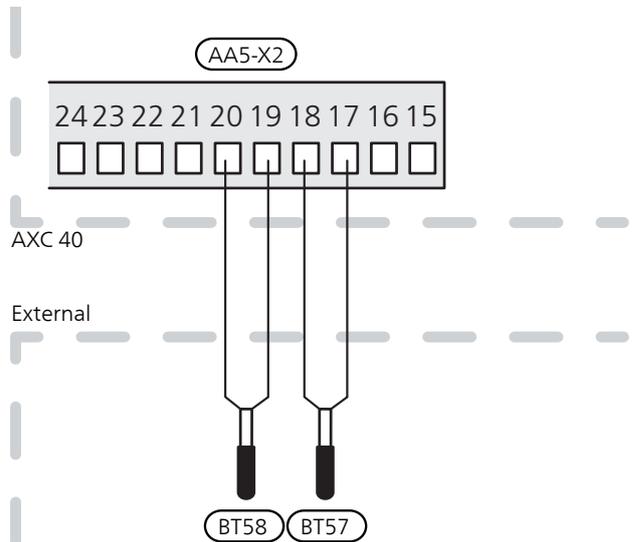
**Caution**

For the alarm to be activated, software of at least 7740R2 must be installed on your heat pump.

Two sensors (BT57 and BT58) can be connected to display the temperatures on the ground water side. An alarm can be activated in menu 5.3.23 to block the compressor if the ground water out (BT58) from the heat exchanger is below the set temperature. Blocking stops automatically when the temperature of BT58 rises by two degrees above the set temperature. The default setting for the alarm is deactivated.

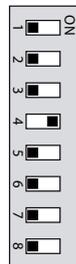
Connect BT57 to AA5-X2:17-18 on AXC 40 the accessory board.

Connect BT58 to AA5-X2:19-20 on AXC 40 the accessory board.



## DIP switch

The DIP switch (S2) on the accessory card (AA5) must be set as follows.



## Program settings

Program setting of AXC 40 can be performed via the start guide or directly in the menu system.

### Start guide

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

### Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

#### **Menu 5.2 - system settings**

Activating/deactivating of accessories.

Select: "ground water pump".

#### **Menu 5.3.23 - ground water pump**

Activating/deactivating of alarm and setting min temperature.

Select: "Alarm at min temp" yes/no.

Select: "Min temp groundwater" (default 3°C).

#### **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.

EP12-AA5-K1: No function.

EP12-AA5-K2: No function.

EP12-AA5-K3: No function.

EP12-AA5-K4: Activating the circulation pump (GP3).



#### **Caution**

Also see the Installer manual for the heat pump.









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