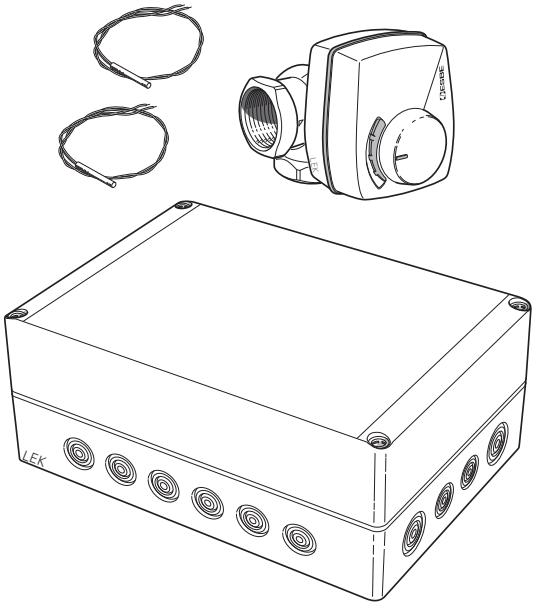
Installer manual

NIBE

Accessories
PVT 40



IHB EN 2419-1
831240

S-series

F-series

S-series _____ *?*

F-series _____ *?*

S-series

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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.

For the latest version of the product's documentation, see nibe.eu.

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.

PVT 40 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.

If the supply cable is damaged, only NIBE, its service representative or similar authorised person may replace it to prevent any danger and damage.

Symbols

Explanation of symbols that may be present in this manual.

CAUTION!

This symbol indicates danger to person or machine.

NOTE!

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).

Danger to person or machine.

General

Using this accessory, PV-T panels can be used as a heat source for the heat pump.

This function is not suitable in climates where the temperature is below 0°C for an extended period.

The heat pump controls shunt valve (GZ1-QN41) to limit the maximum incoming brine temperature via brine sensor, supply line (GZ1-BT26). When the sensor registers a value above the maximum set temperature, the shunt valve is closed to reduce the proportion of incoming brine.

NOTE!

The function is only active when a compressor in the system is running.

DEFROSTING

CAUTION!

Only applies to PC models.

Passive defrosting

During passive defrosting, the outdoor air performs the defrosting. If the temperature drops too low at the sensor for heat source (GZ1-BT53), the shunt valve (GZ1-QN41) is blocked.

The brine sensor checks the supply line (BT26) regularly to determine whether any ice has melted.

Active defrosting

During active defrosting, the energy from the house or the hot water performs the defrosting. The circulation pump for the brine runs at low speed while the heating medium's circulation pump runs at high speed. Defrosting continues for 30 minutes after activation, or until it is stopped manually.

The defrosting relay can be used to start/stop defrosting via the external system.

The compressor is blocked during defrosting.

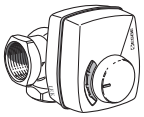
The PC models switch shunt, brine (QN41) to hot water mode, and if electric additional heat is permitted during defrosting, the immersion heater is stepped in progressively based on demand.

Active defrosting is activated via the heat pump's menu system.

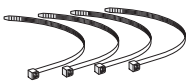
Compatible products

- S1156
- S1155
- S1256
- S1255

Contents

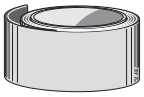


Shunt valve (QN41)
1 x

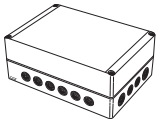


Cable tie
4 x

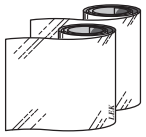
Heat conducting paste
2 x



Insulation tape
1 x

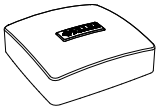


AXC module (AA25)
1 x



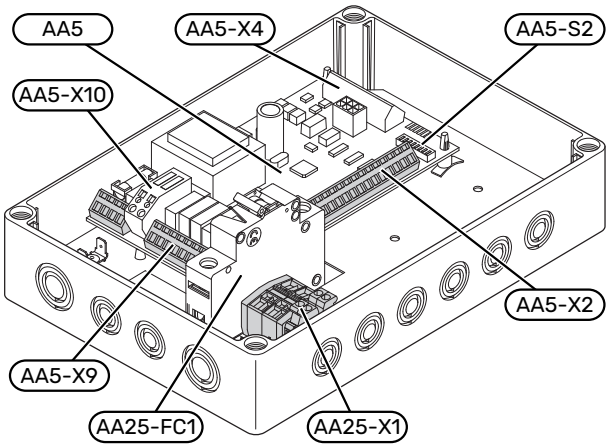
Aluminium tape
2 x

Temperature sensor (BT26)
1 x



Sensor for external heat source (BT53)
1 x

Component location, AXC module (AA25)



ELECTRICAL COMPONENTS

AA5	Accessory card	
	AA5-S2	DIP switch
	AA5-X2	Terminal block, inputs
	AA5-X9	Terminal block, outputs
	AA5-X10	Terminal block, power supply
AA25	AXC module	
	AA25-FC1	Miniature circuit-breaker
	AA25-X1	Terminal block, power supply

Designations according to standard EN 81346-2.

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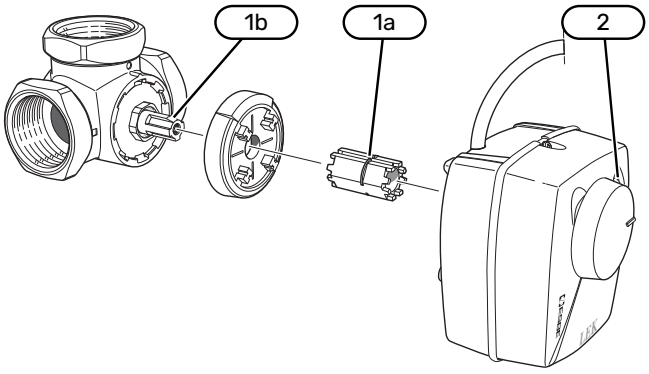
Shunt valve

The shunt valve (GZ1-QN41) is placed in the brine's return line to the heat pump via T-pipe connections according to the outline diagram.

INSTALLING THE VALVE MOTOR

1. Make sure that the recess, in the shaft (1a) and the shaft on the valve (1b), is facing the door ▲. In this example ● and ■ are open, while ▲ is initially closed.
2. Ensure that the knob on the motor is turned all the way to the right.
3. Turn the knob to the left to close ● and open ▲.



The symbols are marked on the terminals.

Temperature sensor

Brine sensor, supply line (GZ1-BT26) is installed on brine in after shunt valve (GZ1-QN41).

Brine sensor, return line (GZ1-BT27) is installed between heat pump and T-pipe.

In addition to brine sensor, supply line (GZ1-BT26) and brine sensor, return line (GZ1-BT27), a further three optional temperature sensors can be installed.

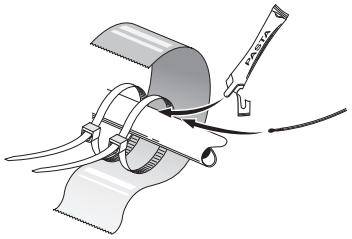
For optimum operation of the function, the temperature sensors should be installed.

- BT53 - sensor for external heat source (controlling)
- BT57 - brine sensor, supply line (displaying)
- BT58 - brine sensor, return line (displaying)

Sensor for external heat source (GZ1-BT53) is installed outdoors in the shade under the panels and is connected to PVT 40.

Brine sensor, supply line (GZ1-BT57) is installed on the supply line between collector and shunt valve (GZ1-QN41).

Brine sensor, return line (GZ1-BT58) is installed on the return line between collector and shunt valve (GZ1-QN41).



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

> **CAUTION!**
>
> To prevent interference, communication cables to external connections must not be laid in the vicinity of high voltage cables.

System diagram

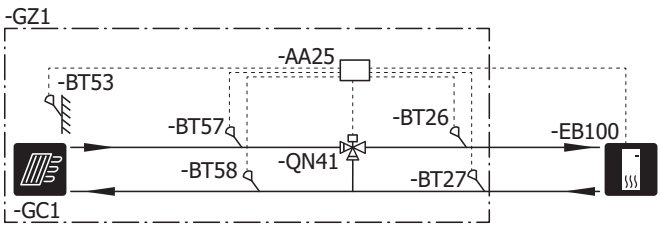
NOTE!

This is a system diagram. The actual installation must be planned according to applicable standards.

EXPLANATION

EB100	**Heat pump**
GZ1	**PV-T collector**
AA25	AXC module
BT26	Brine sensor, supply line
BT27	Brine sensor, return line
BT53	Sensor for external heat source (optional)
BT57	Brine sensor, supply line (optional)
BT58	Brine sensor, return line (optional)
GC1	PV-T panels
QN41	Shunt valve, brine

Designations according to standard EN 81346-2.



Electrical connection

CAUTION!

All electrical connections must be carried out by an authorised electrician.

Electrical installation and wiring must be carried out in accordance with national provisions.

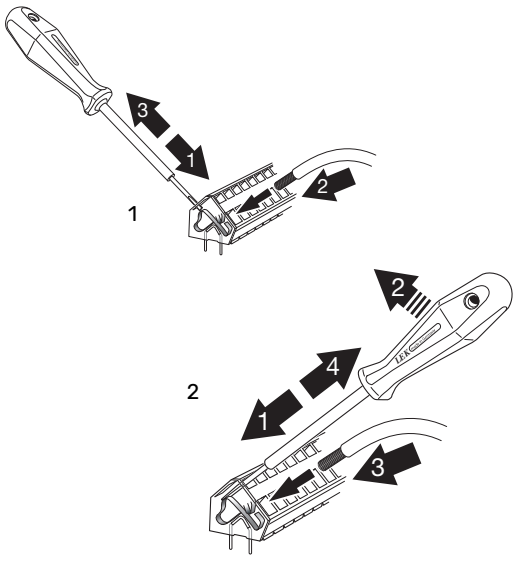
The main product must be disconnected from the power supply when installing PVT 40.

- To prevent interference, communication cables to external connections must not be laid in the vicinity of 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.
- PVT 40 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.
- Mark the relevant electrical cabinet with a warning about external voltage, in those cases where a component in the cabinet has a separate supply.
- PVT 40 restarts after a power failure.

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

CABLE LOCK

Use a suitable tool to release/lock cables in terminal blocks.



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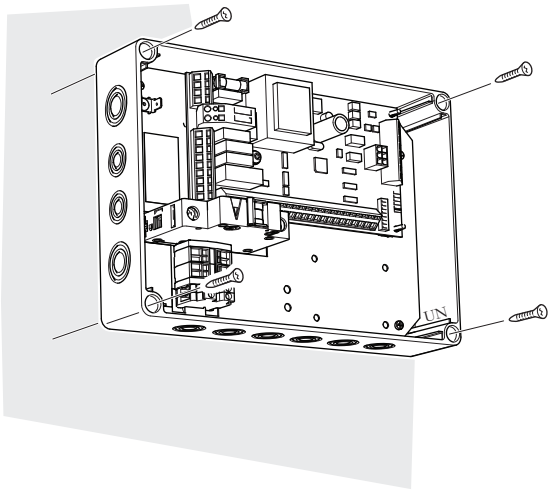
MOUNTING

The AXC module (AA25) is a separate, electric control module and must be mounted on a wall.

> **NOTE!**
>
> The screw type must be adapted to the surface on which installation is taking place.
>
> Installation is not permitted using glue or tape.

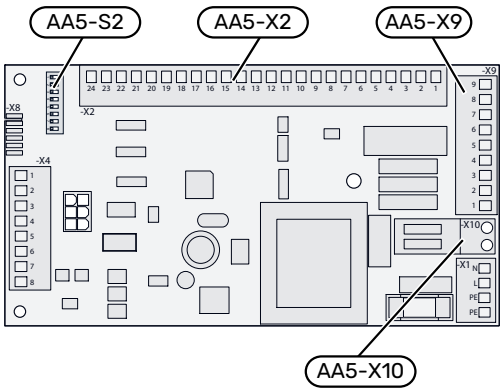


Use all mounting points and mount the module upright, flat against the wall.

Leave at least 100 mm of free space around the module to allow access and make cable routing easier during installation and servicing.

> **CAUTION!**
>
> The installation must be carried out in such a way that IP21 is satisfied.

OVERVIEW ACCESSORY BOARD (AA5)

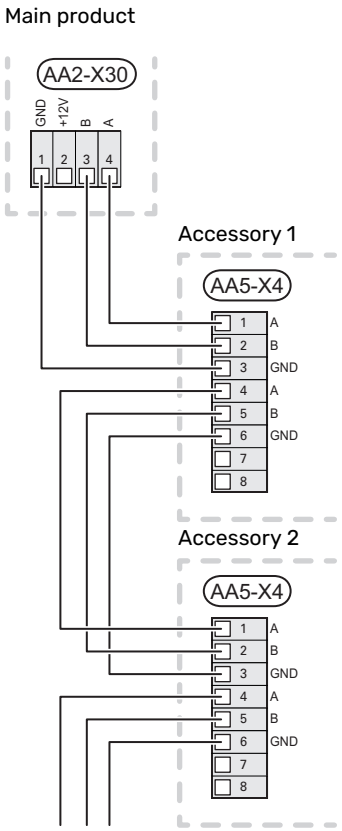


CONNECTING COMMUNICATION

PVT 40 contains an accessory board (AA5) that connects directly to the main product's PCB (terminal block AA2-X30).

If several accessories are to be connected, or are already installed, the boards are connected in series.

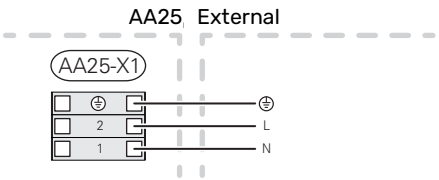
Because there can be different connections for accessories with accessory board (AA5), you should always read the instructions in the manual for the accessory that is to be installed.



POWER CONNECTION

Connect the power supply cable to terminal block AA25-X1 as illustrated.

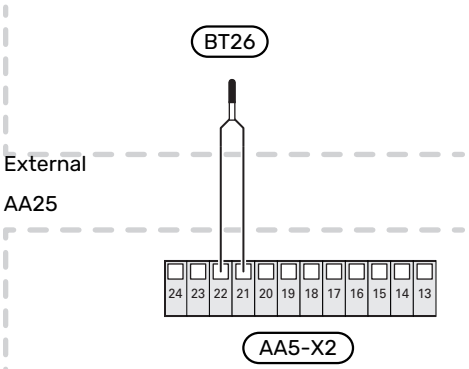
Tightening torque for earth cable: 0.5–0.6 Nm.



CONNECTION OF SENSORS AND EXTERNAL BLOCKING

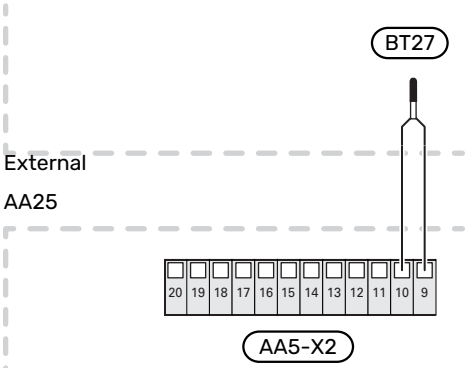
Brine sensor, supply line (GZ1-BT26)

Connect sensor to AA5-X2:21-22.



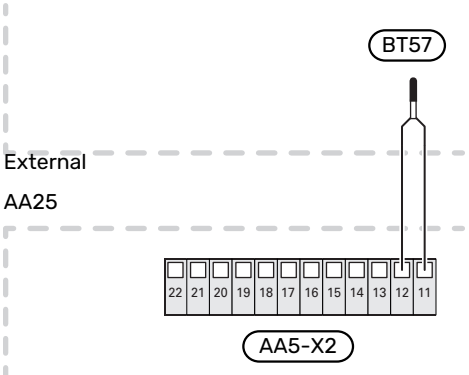
Brine sensor, return line (GZ1-BT27)

Connect the sensor to AA5-X2:9-10.



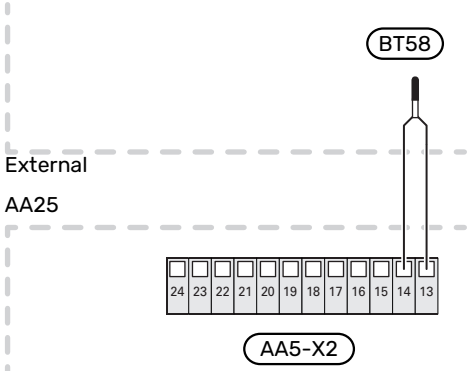
Brine sensor, supply line (GZ1-BT57) (optional)

Connect the sensor to AA5-X2:11-12.



Brine sensor, return line (GZ1-BT58) (optional)

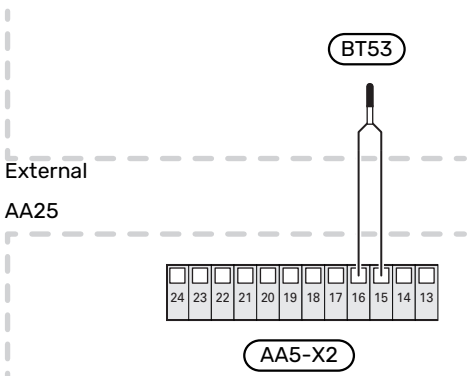
Connect the sensor to AA5-X2:13-14.



Sensor for external heat source (GZ1-BT53) (optional)

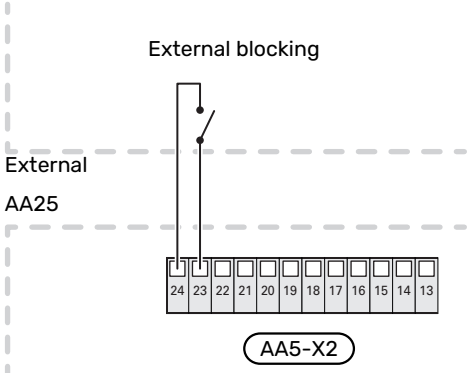
Connect the sensor to AA5-X2:15-16.

> **NOTE!**
>
> Sensor cable splicing must fulfil IP54.



External blocking (optional)

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

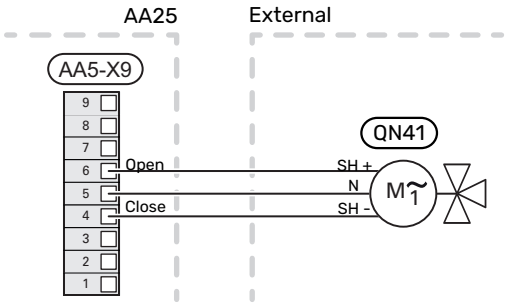


> **NOTE!**
>
> The relay outputs on the accessory board can have a max load of 2 A (230 V) in total.

S

CONNECTION OF THE SHUNT VALVE MOTOR (GZ1-QN41)

Connect the shunt motor (QN41) to AA5-X9:6 (230 V, open), AA5-X9:5 (N) and AA5-X9:4 (230 V, close).

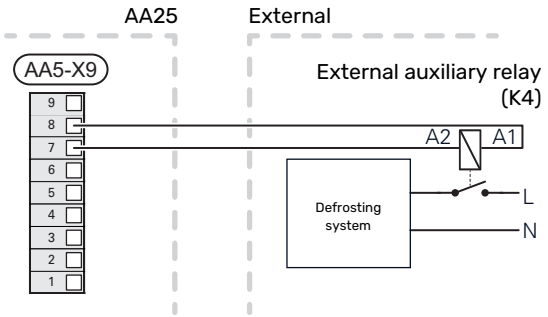


S

CONNECTION OF DEFROSTING RELAY (K4) (OPTIONAL)

External system for defrosting is connected to AA5-X9:8 (NO) and AA5-X9:7 (N).

To obtain inverter function AA5-X9:9 (NC) and AA5-X9:7 (N).

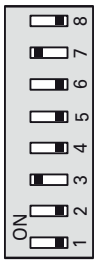


NOTE!

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

DIP SWITCH

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



Activating PVT 40

Activating PVT 40 can be performed via the start guide or directly in the menu system.

The main product's software must be the latest version.

START GUIDE

The start guide appears upon first start-up after heat pump installation, but is also found in menu 7.7.

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 7.2.1 - Add/remove accessories

Here, you state which accessories are installed for the compatible product.

To identify connected accessories automatically, select "Search for accessories". It is also possible to select accessories manually from the list.

Menu 7.1.2.8 - Brine alarm, settings

Here, you can set the lowest and highest temperature for brine in, as well as the highest temperature at which the system will initiate an alarm.

Menu 7.2.25 - NIBE PVT Source (PVT)

Max brine in
Setting range: 0 - 30°C

Allow additional heat during defrosting
Alternative: on/off

The K4 relay is Normally Closed
Alternative: on/off

Max brine in: Here, you set the maximum temperature for incoming brine.

Allow additional heat during defrosting: Here, you can choose to allow additional heat during defrosting.

The K4 relay is Normally Closed: Here, you can choose to allow the defrosting relay (K4) to be closed or open. Only applies in the PC models.

Menu 7.5.3 - Forced control

Here, you can control whether the shunt valves (GZ1-QN41) and/or (EB100-QN10) are to close or open.

You can also force start the defrosting relay (K4) on the AXC board.

NOTE!

Also see the Installer Manual for the main product.

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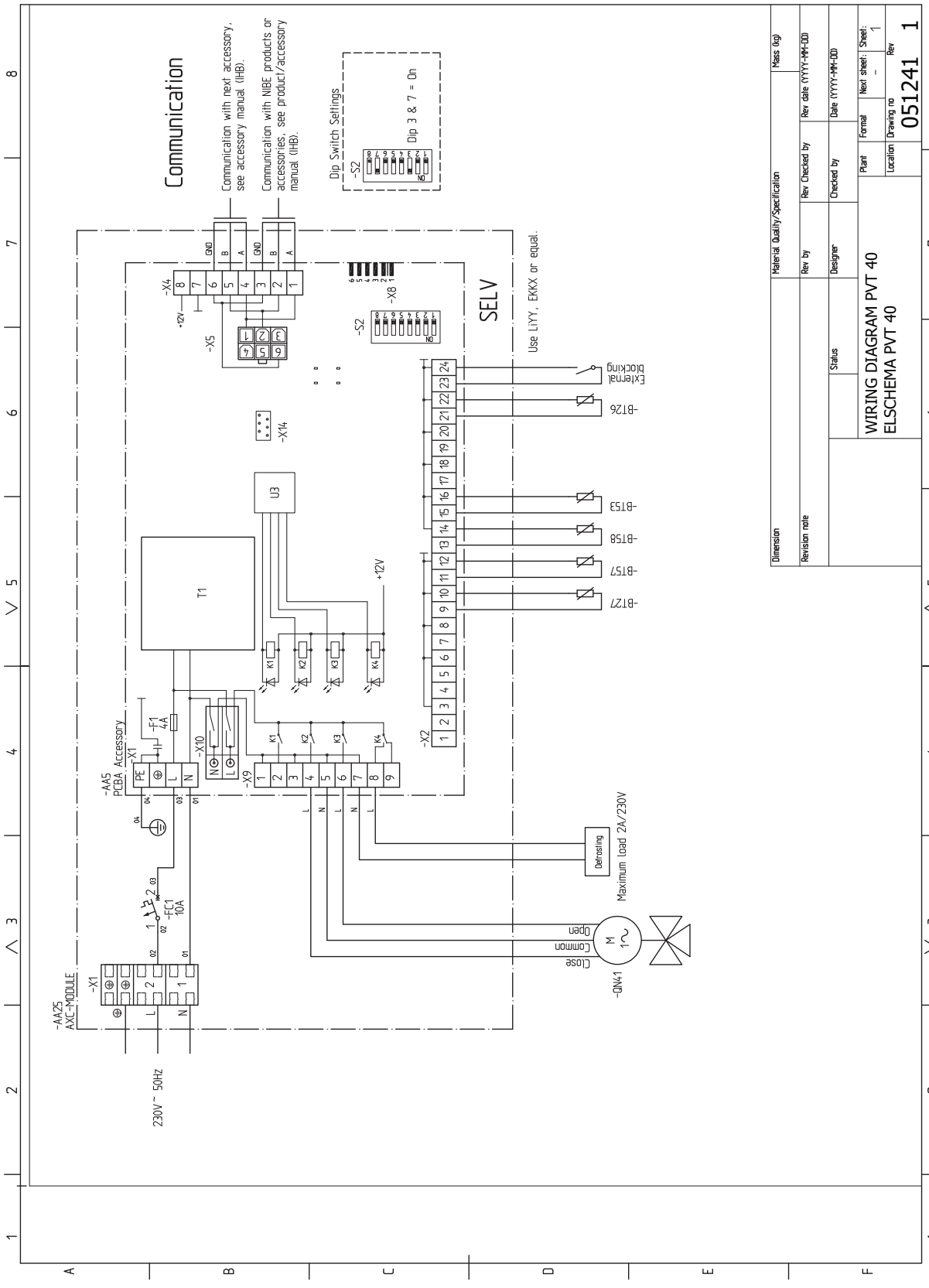
AXC module		
Electrical data		
Rated voltage		230 V ~ 50 Hz
Enclosure class		IP21
Rated value for impulse voltage	kV	4
Pollution degree		2
Min fuse rating	A	10
Miscellaneous		
Operation mode according to EN 60 730-1		Type 1
Area of operation	°C	-25 – 70
Ambient temperature	°C	5 – 35
Program cycles, hours		1, 24
Program cycles, days		1, 2, 5, 7
Resolution, program	min.	1
Temperature during ball pressure test according to EN 60 730-1	°C	75
Dimensions LxWxH	mm	175x250x100
Weight	kg	1.47

PVT 40		
Max. charge power	kW	40
Connection shunt valve		DN32 (1 1/4")
K_{vs} value shunt valve		16.0
Part No.		057 245

ELECTRICAL CIRCUIT DIAGRAM



F-series

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PVT 40 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.

If the supply cable is damaged, only NIBE, its service representative or similar authorised person may replace it to prevent any danger and damage.

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Danger to person or machine.

F

General

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> NOTE!
>
> The function is only active when a compressor in the system is running.

DEFROSTING

> CAUTION!
> Only applies to PC models.

Passive defrosting

During passive defrosting, the outdoor air performs the defrosting. If the temperature drops too low at the sensor for heat source (GZ1-BT53), the shunt valve (GZ1-QN41) is blocked.

The brine sensor checks the supply line (BT26) regularly to determine whether any ice has melted.

Active defrosting

During active defrosting, the energy from the house or the hot water performs the defrosting. The circulation pump for the brine runs at low speed while the heating medium's circulation pump runs at high speed. Defrosting continues for 30 minutes after activation, or until it is stopped manually.

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The compressor is blocked during defrosting.

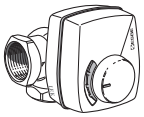
The PC models switch shunt, brine (QN41) to hot water mode, and if electric additional heat is permitted during defrosting, the immersion heater is stepped in progressively based on demand.

Active defrosting is activated via the heat pump's menu system.

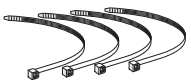
Compatible products

- F1145
- F1155
- F1245
- F1255
- F1345
- F1355

Contents

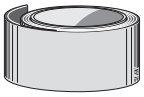


Shunt valve (QN41)
1 x

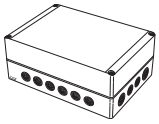


Cable tie
4 x

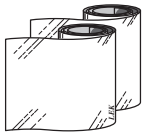
Heat conducting paste
2 x



Insulation tape
1 x

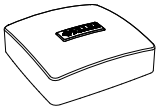


AXC module (AA25)
1 x



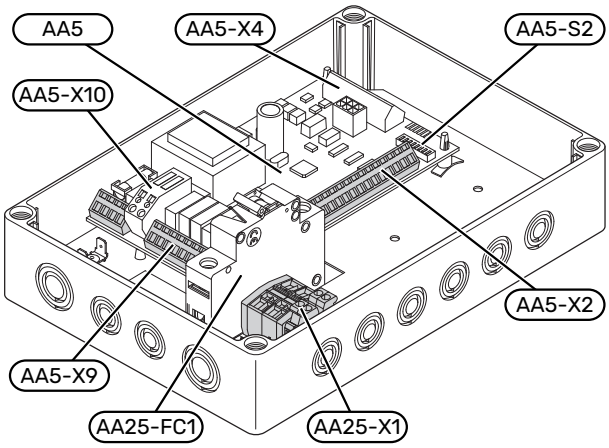
Aluminium tape
2 x

Temperature sensor (BT26)
1 x



Sensor for external heat source (BT53)
1 x

Component location, AXC module (AA25)



ELECTRICAL COMPONENTS

AA5	Accessory card	
	AA5-S2	DIP switch
	AA5-X2	Terminal block, inputs
	AA5-X9	Terminal block, outputs
	AA5-X10	Terminal block, power supply
AA25	AXC module	
	AA25-FC1	Miniature circuit-breaker
	AA25-X1	Terminal block, power supply

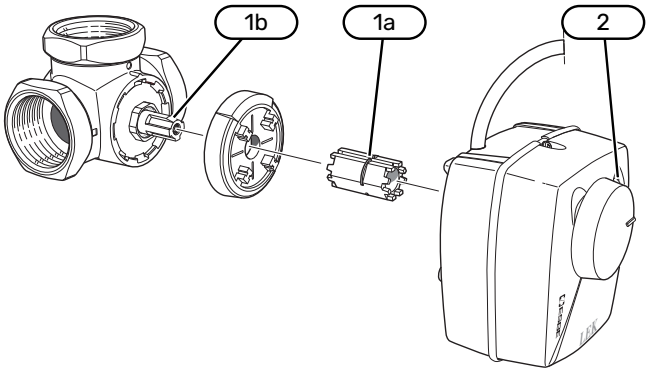
Designations according to standard EN 81346-2.

Shunt valve

The shunt valve (GZ1-QN41) is placed in the brine's return line to the heat pump via T-pipe connections according to the outline diagram.

INSTALLING THE VALVE MOTOR

1. Make sure that the recess, in the shaft (1a) and the shaft on the valve (1b), is facing the door ▲. In this example ● and ■ are open, while ▲ is initially closed.
2. Ensure that the knob on the motor is turned all the way to the right.
3. Turn the knob to the left to close ● and open ▲.



The symbols are marked on the terminals.

Temperature sensor

Brine sensor, supply line (GZ1-BT26) is installed on brine in after shunt valve (GZ1-QN41).

Brine sensor, return line (GZ1-BT27) is installed between heat pump and T-pipe.

In addition to brine sensor, supply line (GZ1-BT26) and brine sensor, return line (GZ1-BT27), a further three optional temperature sensors can be installed.

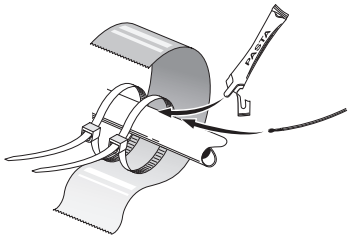
For optimum operation of the function, the temperature sensors should be installed.

- BT53 - sensor for external heat source (controlling)
- BT57 - brine sensor, supply line (displaying)
- BT58 - brine sensor, return line (displaying)

Sensor for external heat source (GZ1-BT53) is installed outdoors in the shade under the panels and is connected to PVT 40.

Brine sensor, supply line (GZ1-BT57) is installed on the supply line between collector and shunt valve (GZ1-QN41).

Brine sensor, return line (GZ1-BT58) is installed on the return line between collector and shunt valve (GZ1-QN41).



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

> **CAUTION!**
>
> To prevent interference, communication cables to external connections must not be laid in the vicinity of high voltage cables.

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System diagram

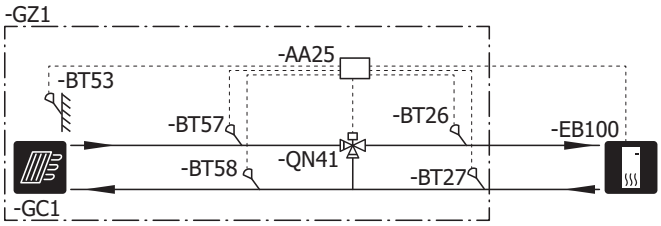
NOTE!

This is a system diagram. The actual installation must be planned according to applicable standards.

EXPLANATION

EB100	**Heat pump**
GZ1	**PV-T collector**
AA25	AXC module
BT26	Brine sensor, supply line
BT27	Brine sensor, return line
BT53	Sensor for external heat source (optional)
BT57	Brine sensor, supply line (optional)
BT58	Brine sensor, return line (optional)
GC1	PV-T panels
QN41	Shunt valve, brine

Designations according to standard EN 81346-2.



Electrical connection

CAUTION!

All electrical connections must be carried out by an authorised electrician.

Electrical installation and wiring must be carried out in accordance with national provisions.

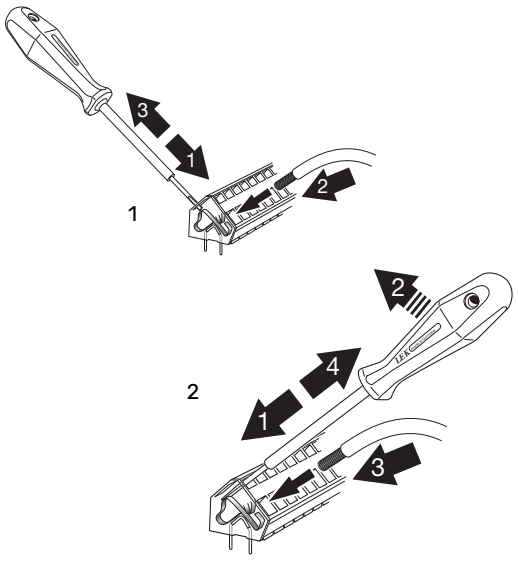
The main product must be disconnected from the power supply when installing PVT 40.

- To prevent interference, communication cables to external connections must not be laid in the vicinity of 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.
- PVT 40 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.
- Mark the relevant electrical cabinet with a warning about external voltage, in those cases where a component in the cabinet has a separate supply.
- PVT 40 restarts after a power failure.

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

CABLE LOCK

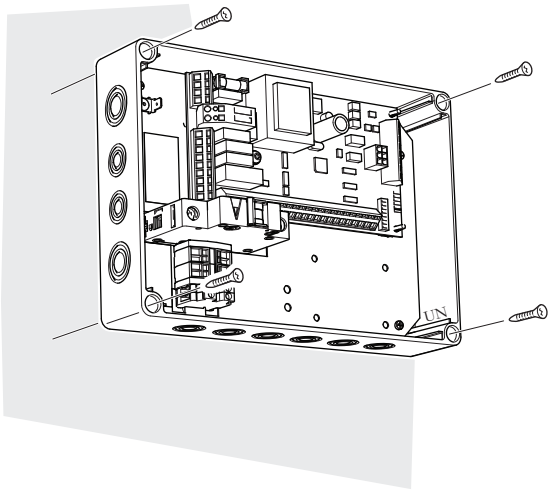
Use a suitable tool to release/lock cables in terminal blocks.



MOUNTING

The AXC module (AA25) is a separate, electric control module and must be mounted on a wall.

> **NOTE!**
>
> The screw type must be adapted to the surface on which installation is taking place.
>
> Installation is not permitted using glue or tape.

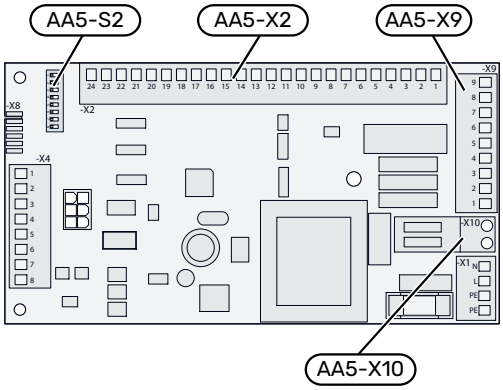


Use all mounting points and mount the module upright, flat against the wall.

Leave at least 100 mm of free space around the module to allow access and make cable routing easier during installation and servicing.

> **CAUTION!**
>
> The installation must be carried out in such a way that IP21 is satisfied.

OVERVIEW ACCESSORY BOARD (AA5)



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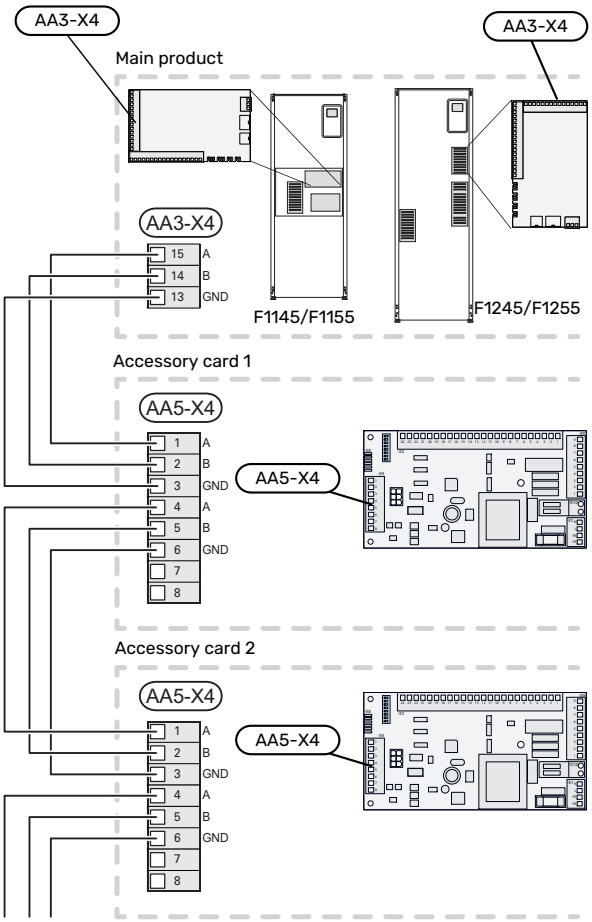
CONNECTING COMMUNICATION

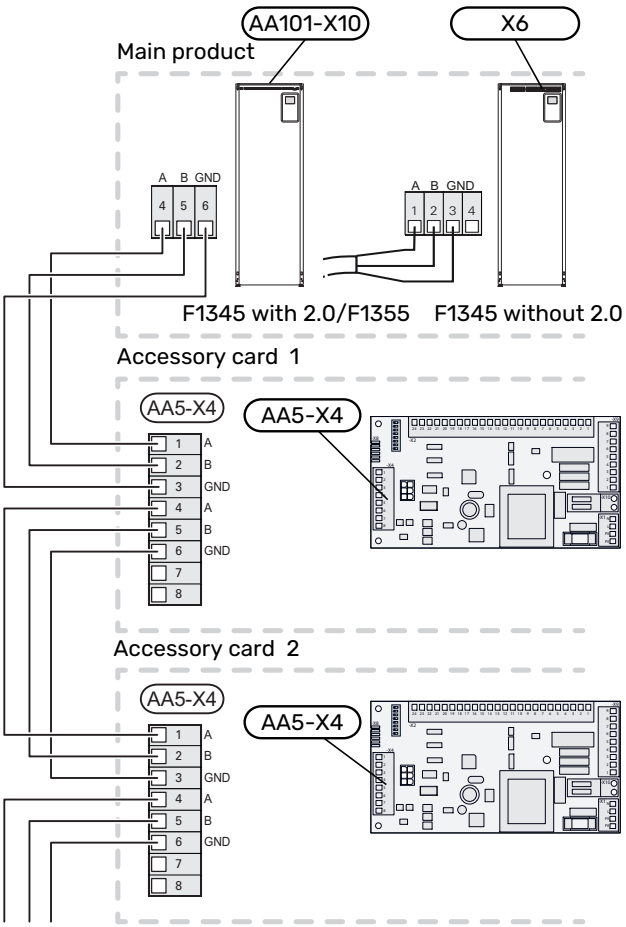
PVT 40 contains an accessory board (AA5) that connects directly to the main product's input board (terminal block AA3-X4).

For F1345 on terminal block X6 or on terminal block AA101-X10 F1345 2.0/F1355.

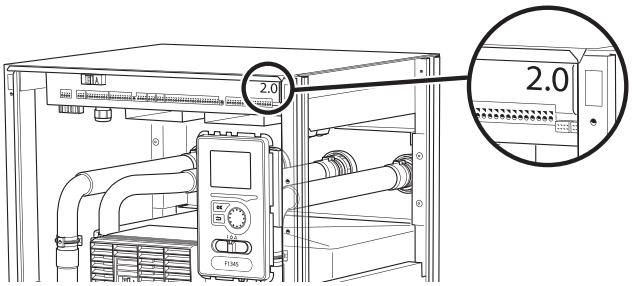
If several accessories are to be connected, or are already installed, the boards are connected in series.

Because there can be different connections for accessories with accessory board (AA5), you should always read the instructions in the manual for the accessory that is to be installed.





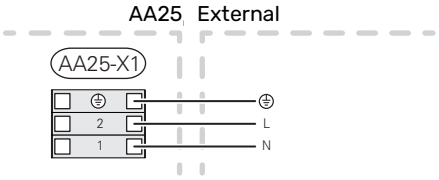
F1345 has different electrical connection versions depending on when the heat pump was manufactured. To check which electrical connection applies to your F1345, check the designation "2.0" visible above the right hand side of the terminal block as illustrated.



POWER CONNECTION

Connect the power supply cable to terminal block AA25-X1 as illustrated.

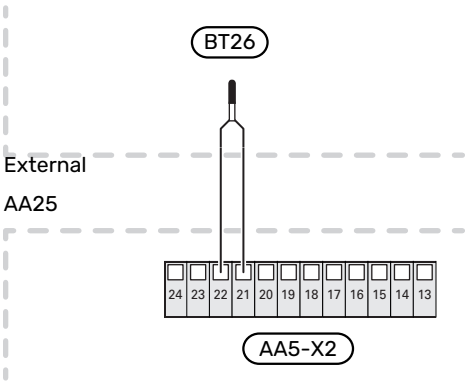
Tightening torque for earth cable: 0.5–0.6 Nm.



CONNECTION OF SENSORS AND EXTERNAL BLOCKING

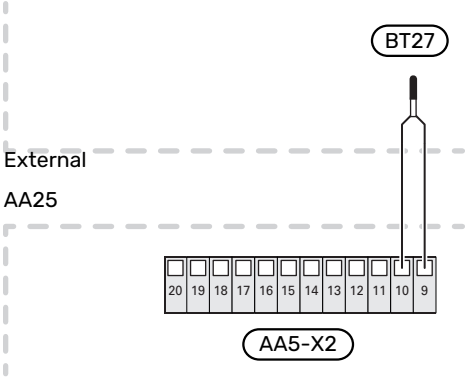
Brine sensor, supply line (GZ1-BT26)

Connect sensor to AA5-X2:21-22.



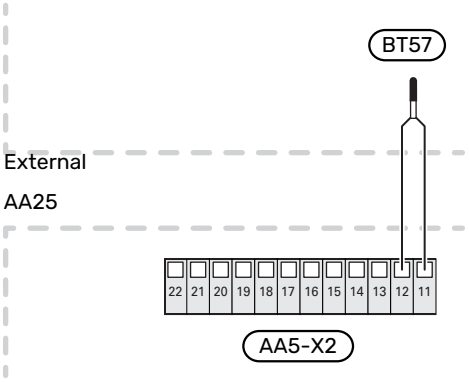
Brine sensor, return line (GZ1-BT27)

Connect the sensor to AA5-X2:9-10.



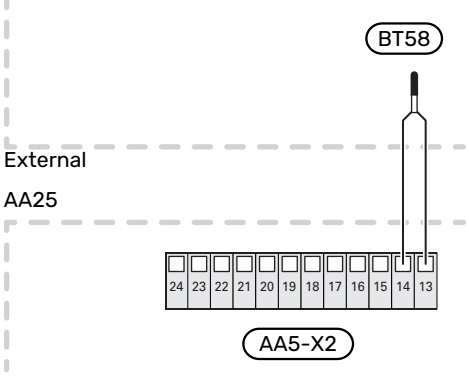
Brine sensor, supply line (GZ1-BT57) (optional)

Connect the sensor to AA5-X2:11-12.



Brine sensor, return line (GZ1-BT58) (optional)

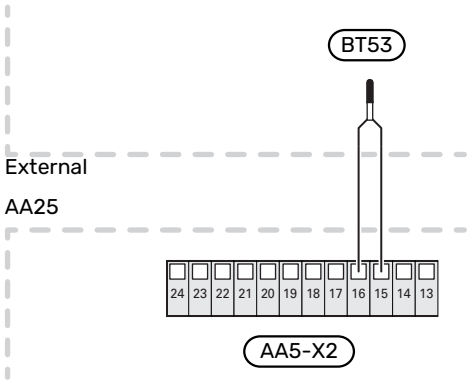
Connect the sensor to AA5-X2:13-14.



Sensor for external heat source (GZ1-BT53) (optional)

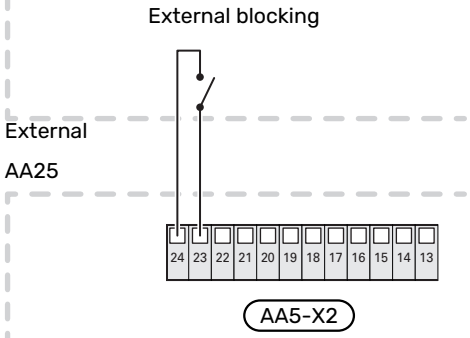
Connect the sensor to AA5-X2:15-16.

> **NOTE!**
>
> Sensor cable splicing must fulfil IP54.



External blocking (optional)

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



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

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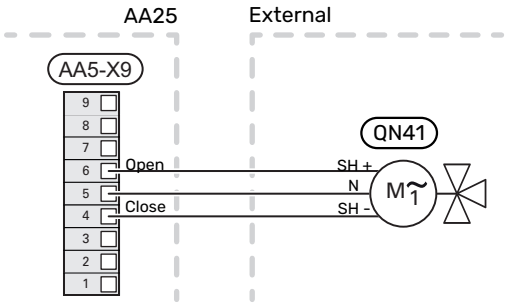
CONNECTION OF THE SHUNT VALVE MOTOR (GZ1-QN41)

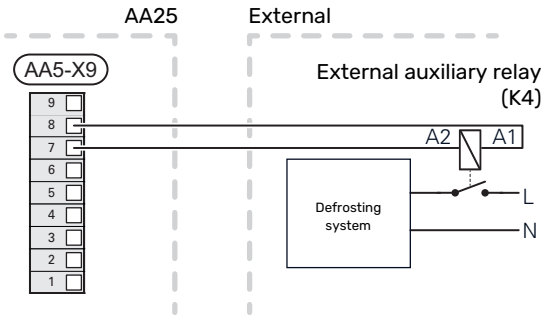
Connect the shunt motor (QN41) to AA5-X9:6 (230 V, open), AA5-X9:5 (N) and AA5-X9:4 (230 V, close).



CONNECTION OF DEFROSTING RELAY (K4) (OPTIONAL)

External system for defrosting is connected to AA5-X9:8 (NO) and AA5-X9:7 (N).

To obtain inverter function AA5-X9:9 (NC) and AA5-X9:7 (N).

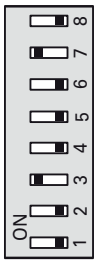


NOTE!

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

DIP SWITCH

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



Activating PVT 40

Activating PVT 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 5.2.4 - accessories

Activating/deactivating of accessories.

Select: "NIBE PVT-source".

Menu 5.1.7 -min. brine out

Setting the lowest brine temperature out.

> NOTE!
>
> For optimum operation, the lowest brine temperature should be changed to -12°C, or the lowest adjustable value.

Menu 5.1.7 -max brine in

Setting the highest brine temperature in.

Menu 5.3.25 -NIBE PVT-source

Here, you can set

- max. brine in, at which temperature the shunt valve (QN41) will start working, max.
- shunt amplification, factory setting 1.0.
- shunt waiting time, factory setting 30 s.
- if electric additional heat will be allowed during defrosting when the reversing valve heating/hot water (EB100-QN10) is in hot water mode. Factory setting: no. Only applies to the PC models.

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.

FN2-AA5-K1: No function.

FN2-AA5-K2: Signal (close) to shunt (QN14).

FN2-AA5-K3: Signal (open) to shunt (QN14).

FN2-AA5-K4: No function.

> NOTE!
>
> Also see the Installer Manual for the main product.

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AXC module		
Electrical data		
Rated voltage		230 V ~ 50 Hz
Enclosure class		IP21
Rated value for impulse voltage	kV	4
Pollution degree		2
Min fuse rating	A	10
Miscellaneous		
Operation mode according to EN 60 730-1		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
Temperature during ball pressure test according to EN 60 730-1	°C	75
Dimensions LxWxH	mm	175x250x100
Weight	kg	1.47

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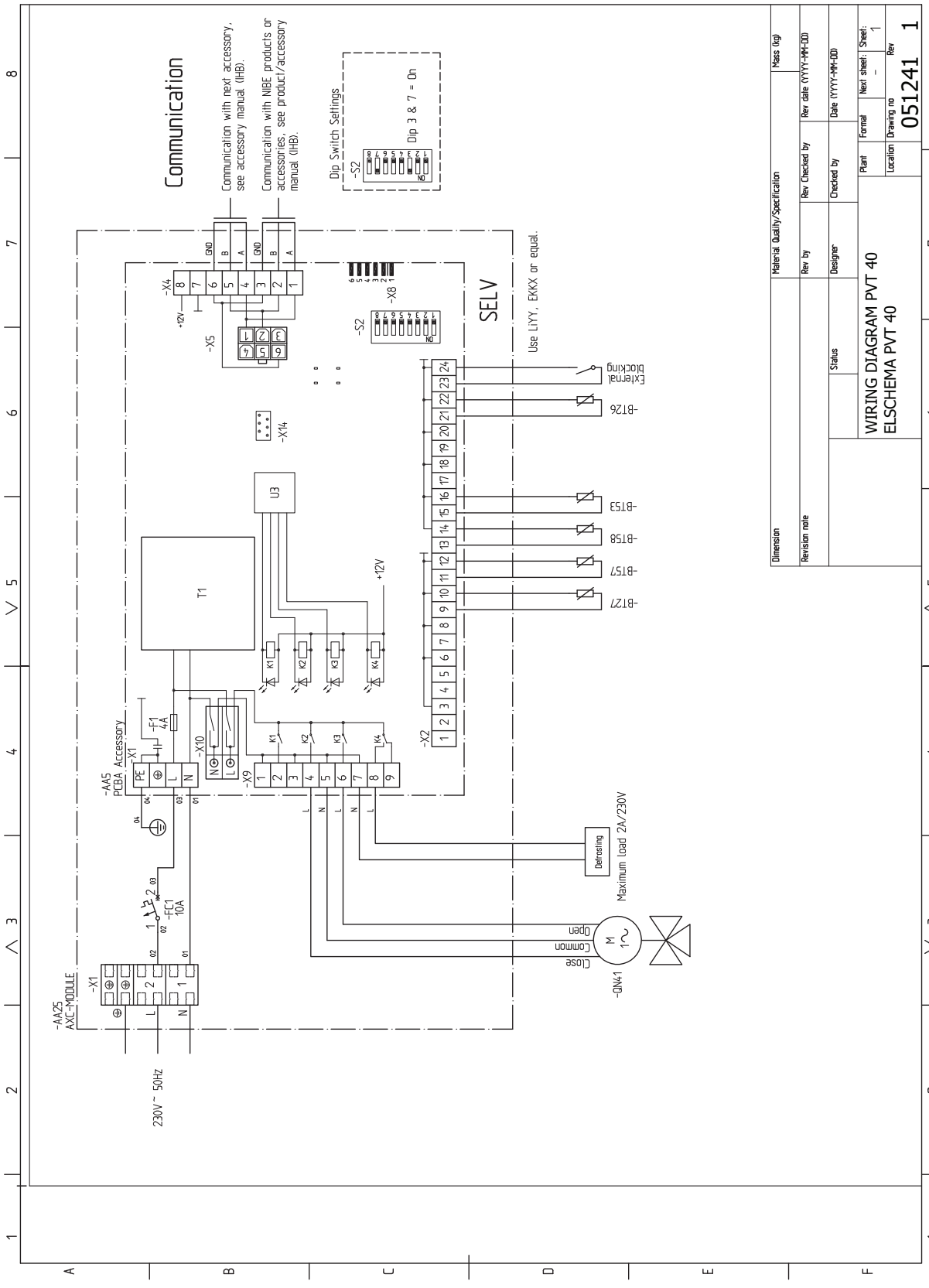
PVT 40		
Max. charge power	kW	40
Connection shunt valve		DN32 (1 1/4")
K_{vs} value shunt valve		16.0
Part No.		057 245

ELECTRICAL CIRCUIT DIAGRAM



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