IHB EN 1848-8
231846

INSTALLER MANUAL

Air/water heat pump
NIBE F2040 *6, 8, 12, 16 – UK 1x230V*



NIBE

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1 Important information

Safety information

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

The manual must be left with the customer.

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

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Symbols

NOTE

This symbol indicates danger to person or machine .

Caution

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

TIP

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

Marking

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

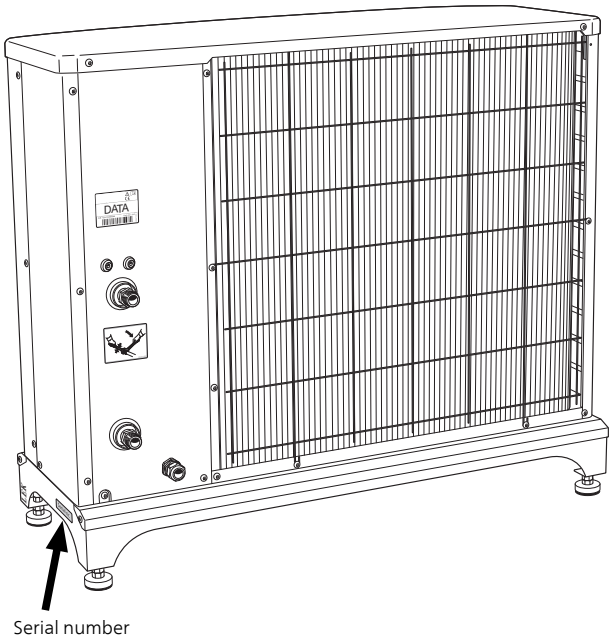
IP24 Classification of enclosure of electro-technical equipment.

Danger to person or machine.

Read the User Manual.

Serial number

The serial number for F2040 can be found on the side of the foot.



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.

Environmental information

This unit contains a fluorinated greenhouse gas that is covered by the Kyoto agreement.

The equipment contains R410A, a fluorinated greenhouse gas with a GWP value (Global Warming Potential) of 2088. Do not release R410A into the atmosphere.

Country specific information

UNITED KINGDOM

This installation is subject to building regulation approval, notify the local Authority of intention to install.

Use only manufacturer's recommended replacement parts.

Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturers instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out the installation, commissioning and servicing work in accordance with the Benchmark Code of practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme. Visit www.centralheating.co.uk for information.

Warranty and insurance information

Thank you for installing a new NIBE heat pump in your home.

NIBE heat pumps are manufactured in Sweden to the very highest standard so we are pleased to offer our customers a comprehensive guarantee.

The product is guaranteed for 24 months for parts and labour from the date of installation or 33 months from the date of manufacture, whichever is the shorter.

The NIBE guarantee is based on the unit being installed and commissioned by a NIBE accredited installer, serviced every year and the Benchmark documents completed. Where this condition is not met, any chargeable spare parts or components issued within the applicable guarantee period still benefit from a 12 month warranty from the date of issue by the manufacturer.

We recommend the installer completes and returns as soon as possible, your guarantee registration card or completes the guarantee form on the NIBE website www.nibe.co.uk.

Electrical Supply

The heat pump must be permanently connected to a 230V ac 50Hz supply.

All system components shall be of an approved type and all wiring to current I.E.E wiring regulations.

External wiring must be correctly earthed, polarised and in accordance with the relevant standards: Currently this is BS 7671.

Heating System

The installation of the heat pump should follow best practice as covered in the following:

BS 5449 Forced circulation hot water central heating systems for domestic premises.

BS 15450 Heating systems in buildings – Design of heat pump heating systems.

Inspection of the installation

Current regulations require the heating installation to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person. Fill in the page for information about installation data in the User manual.

✔	*Description*	*Notes*	*Signature*	*Date*
Heating medium (page 27)				
	System flushed			
	System vented			
	Particle filter			
	Shut-off and drain valve			
	Charge flow set			
Electricity (page 30)				
	Fuses property			
	Safety breaker			
	Earth circuit-breaker			
	Heating cable type/effect			
	Fuse size, heating cable (F3)			
	Communication cable connected			
	F2040 addressed (only when cascade connection)			
	Connections			
	Main voltage			
	Phase voltage			
	When installing F2040-6, check that the software version of the indoor module/control module is at least v8320.			
Miscellaneous				
	Warranty			
	Benchmark checklist			

Compatible indoor modules (VVM) and control modules (SMO)

	VVM 320	*SMO 20*	*SMO 40*
F2040-6	X	X	X
F2040-8	X	X	X
F2040-12	X	X	X

Indoor modules

VVM 320

Stainless steel, 1x230 V

With T&P valve

Part no. 069 112

Control modules

SMO 20

Control module
Part no. 067 224

SMO 40

Control module
Part no. 067 225

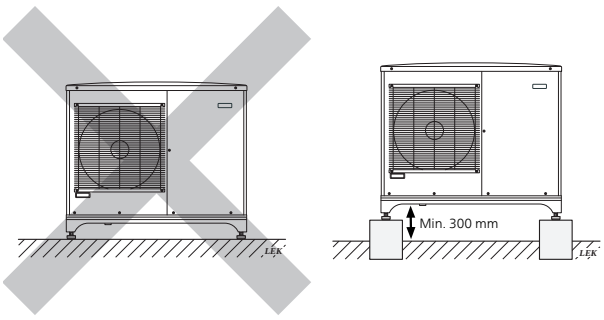
2 Delivery and handling

Transport and storage

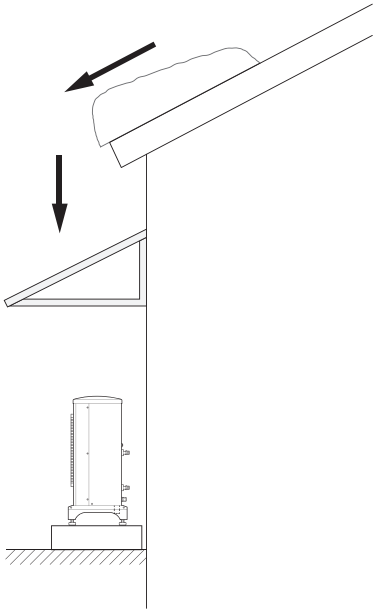
F2040 must be transported and stored vertically.

Assembly

- Place F2040 outdoors on a solid level base that can take the weight, preferably a concrete foundation. If concrete slabs are used they must rest on asphalt or shingle.
- The concrete foundation or slabs must be positioned so that the lower edge of the evaporator is at the level of the average local snow depth, although a minimum of 300 mm.
- The F2040 should not be positioned next to sensitive walls, for example, next to a bedroom.
- Also ensure that the placement does not inconvenience the neighbours.
- F2040 must not be placed so that recirculation of the outdoor air can occur. This causes lower output and impaired efficiency.
- The evaporator should be sheltered from direct wind, which negatively affects the defrosting function. Place F2040 protected from wind against the evaporator.
- Large amounts of condensation water, as well as melt water from defrosting, may be produced. Condensation water must be led off to a drain or similar (see page 10.
- Care must be exercised so that the heat pump is not scratched during installation.



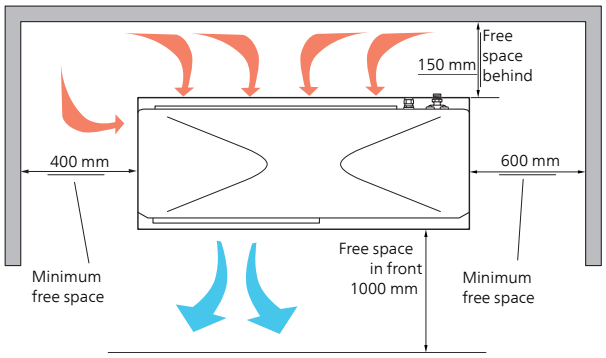
Do not place F2040 directly on the lawn or other non solid surface.



If there is a risk of snow slip from roof, a protective roof or cover must be erected to protect the heat pump, pipes and wiring.

INSTALLATION AREA

The distance between F2040 and the house wall must be at least 150 mm. Clearance in front of F2040 should be at least one metre.



CONDENSATION WATER TROUGH

The condensation water trough collects and leads away most of the condensation water from the heat pump.

NOTE

It is important to the heat pump function that condensation water is led away and that the drain for the condensation water run off is not positioned so that it can cause damage to the house.

Condensation runoff should be checked regularly, especially during the autumn. Clean if necessary.

NOTE

Pipe with heating cable for draining the condensation water trough is not included.

To ensure this function the accessory KVR 10 should be used.

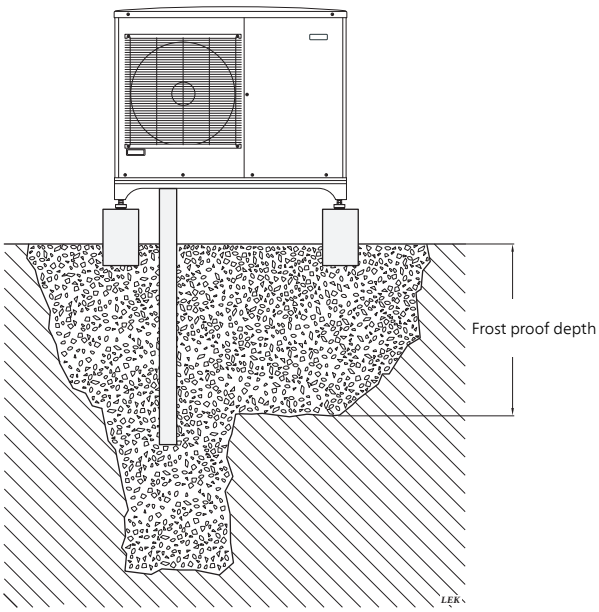
NOTE

The electrical installation and wiring must be carried out under the supervision of an authorised electrician.

- The condensation water (up to 50 litres/24 hrs) that collects in the trough should be routed away by a pipe to an appropriate drain, it is recommended that the shortest outdoor stretch possible is used.
- The section of the pipe that can be affected by frost must be heated by the heating cable to prevent freezing.
- Route the pipe downward from F2040.
- The outlet of the condensation water pipe must be at a depth that is frost free or alternatively indoors (with reservation for local ordinances and regulations).
- Use a water trap for installations where air circulation may occur in the condensation water pipe.
- The insulation must seal against the bottom of the condensation water trough.

Recommended alternative for leading off condensation water

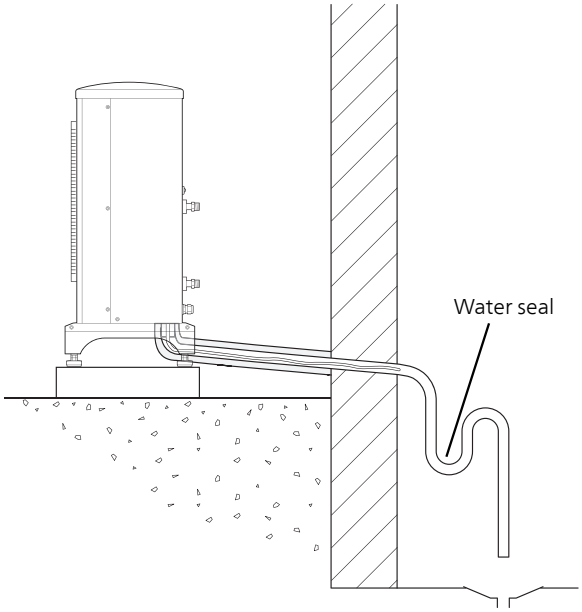
Stone caisson



If the house has a cellar the stone caisson must be positioned so that condensation water does not affect the house. Otherwise the stone caisson can be positioned directly under the heat pump.

The outlet of the condensation water pipe must be at frost free depth.

Drain indoors



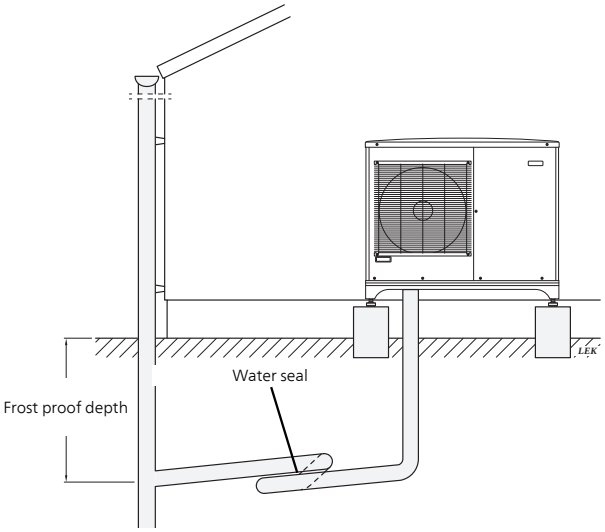
The condensation water is lead to an indoor drain (subject to local rules and regulations).

Route the pipe downward from F2040.

The condensation water pipe must have a water seal to prevent air circulation in the pipe.

KVR 10 spliced as illustrated. Pipe routing inside house not included.

Gutter drainage



The outlet of the condensation water pipe must be at frost free depth.

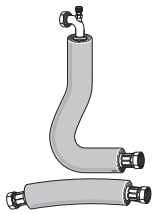
Route the pipe downward from F2040.

The condensation water pipe must have a water seal to prevent air circulation in the pipe.

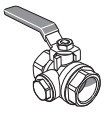
Caution

If none of the recommended alternatives is used good lead off of condensation water must be assured.

Supplied components



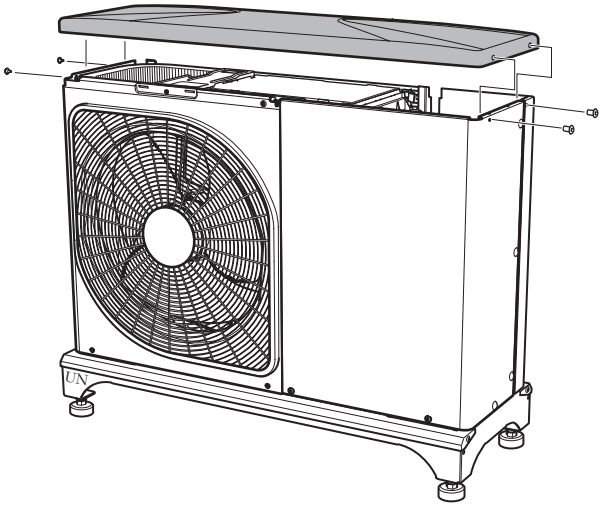
2 x flexible pipes (DN25, G1") with 4 x gaskets.



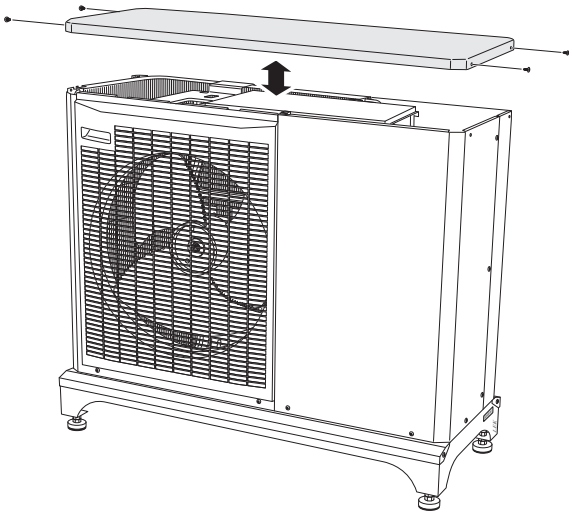
Filterball (G1").

Removing the covers

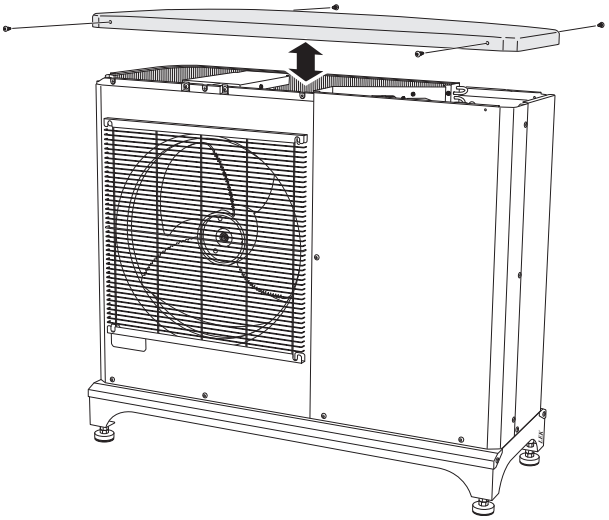
F2040-6



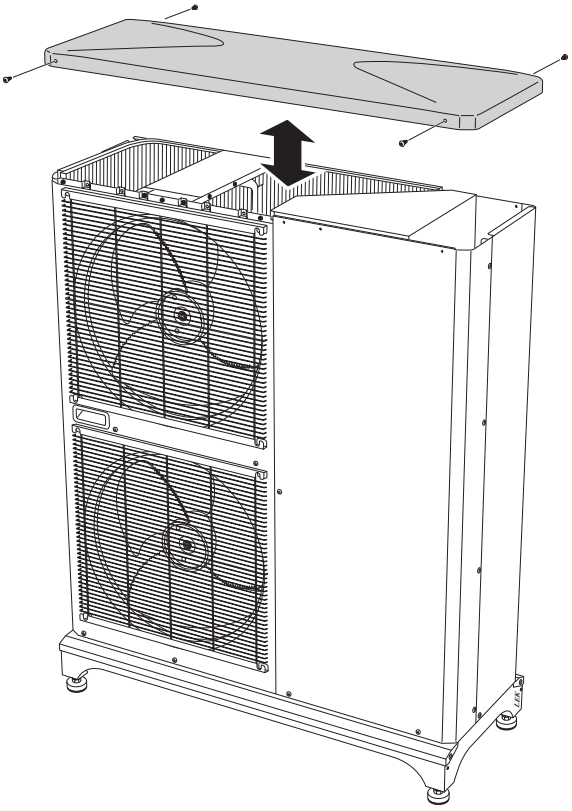
F2040-8



F2040-12

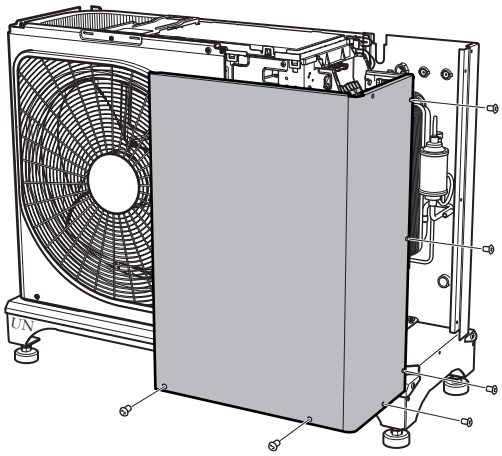


F2040-16

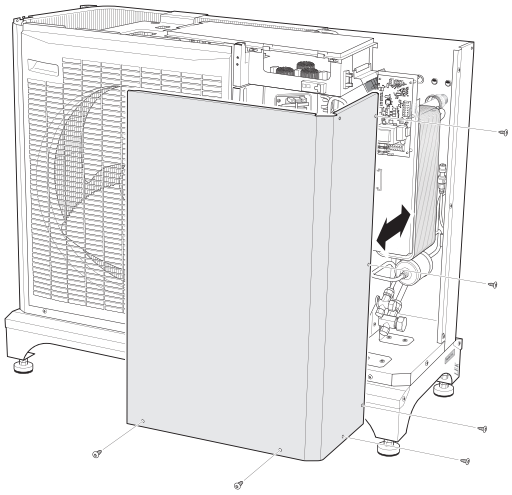


Removing the front panel

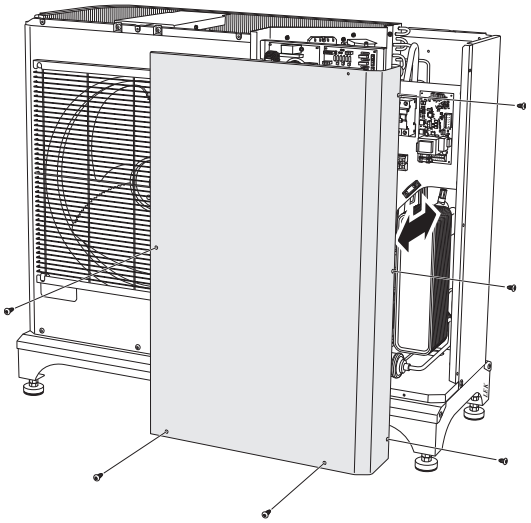
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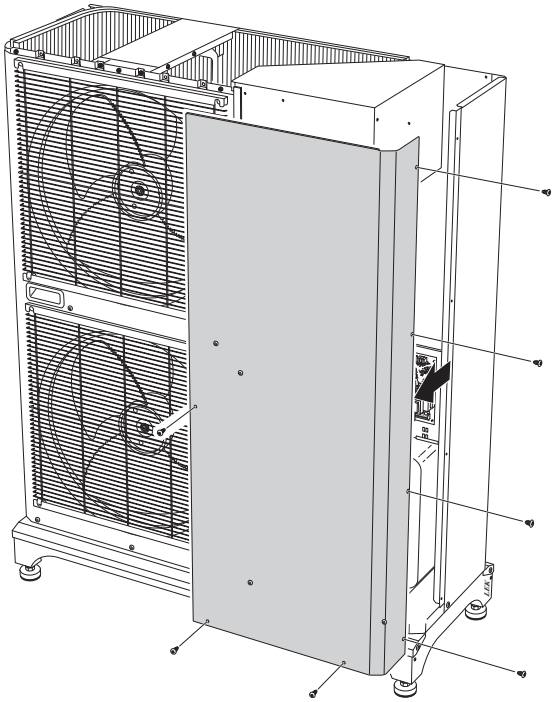
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F2040-12

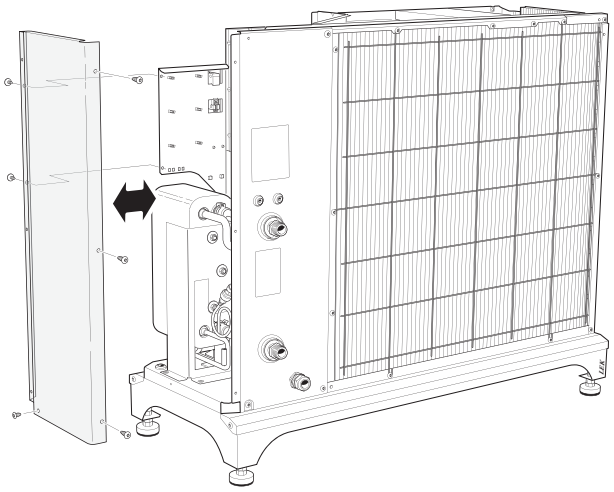


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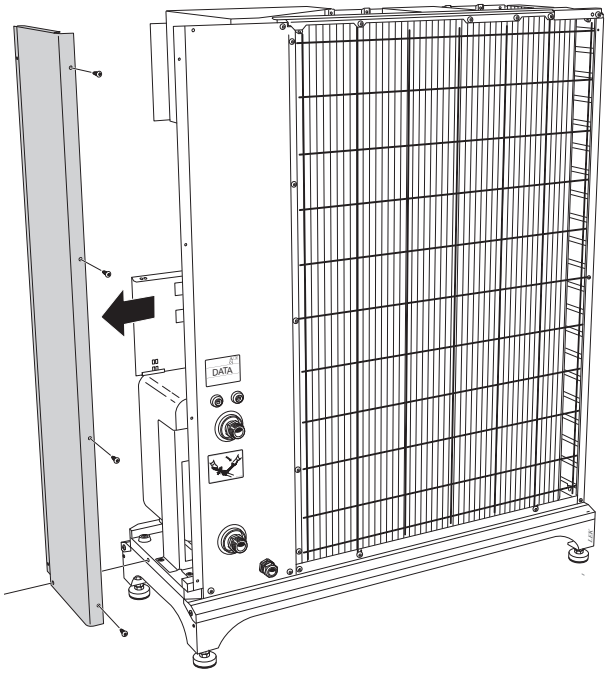


Removing the side panel

F2040-12



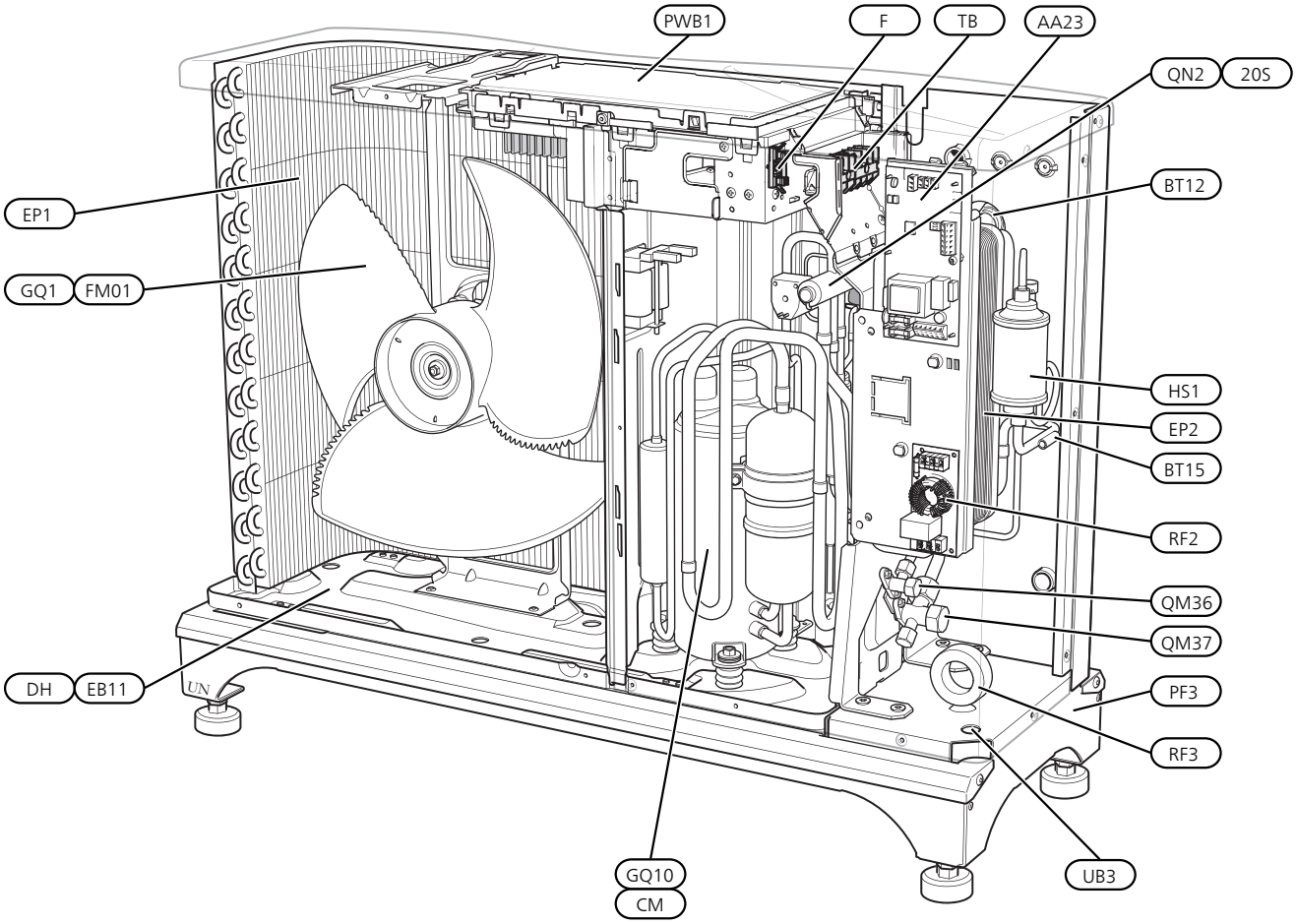
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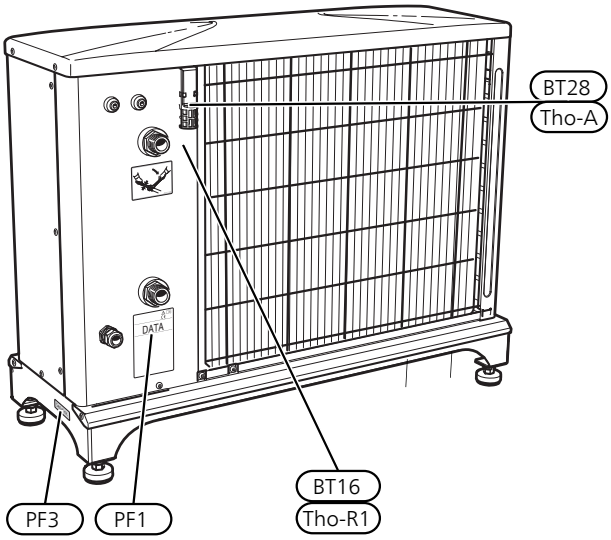


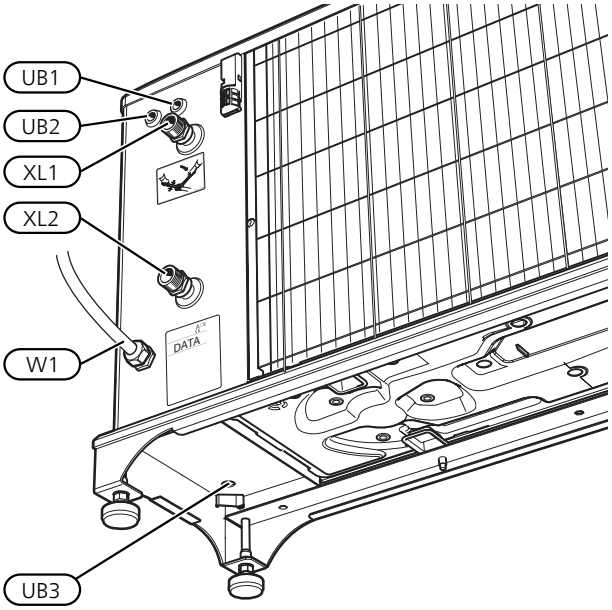
3 The heat pump design

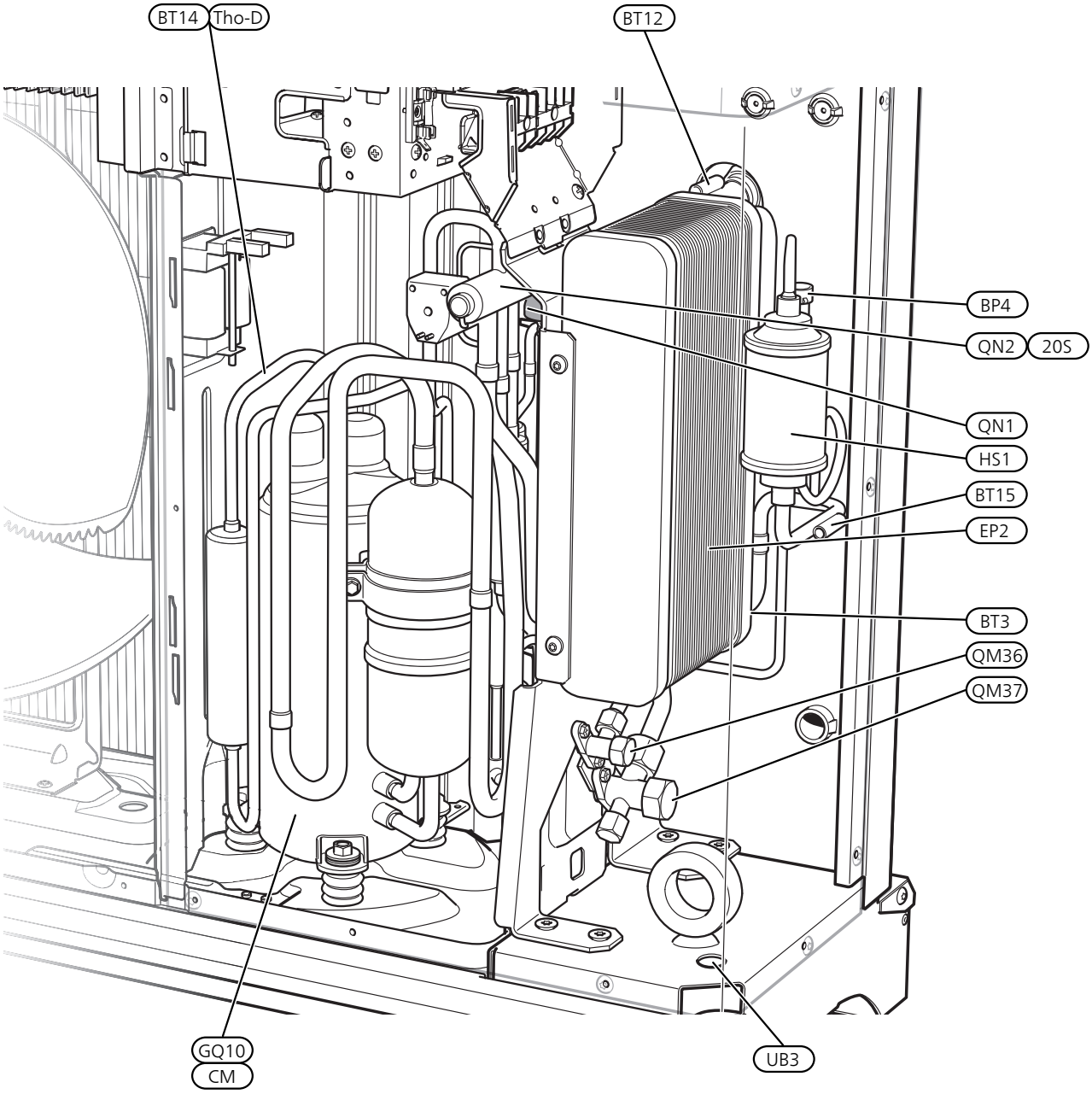
General

F2040-6

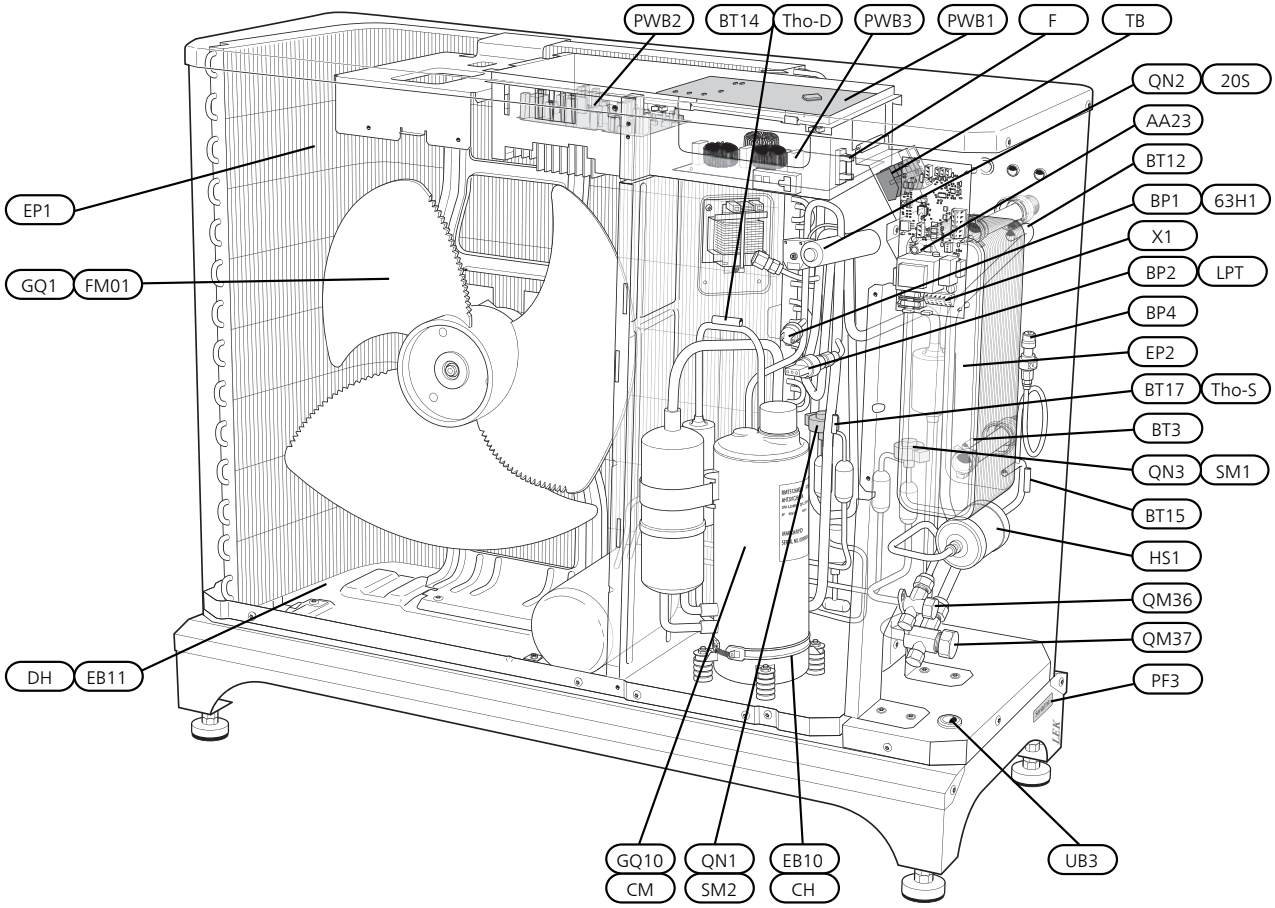


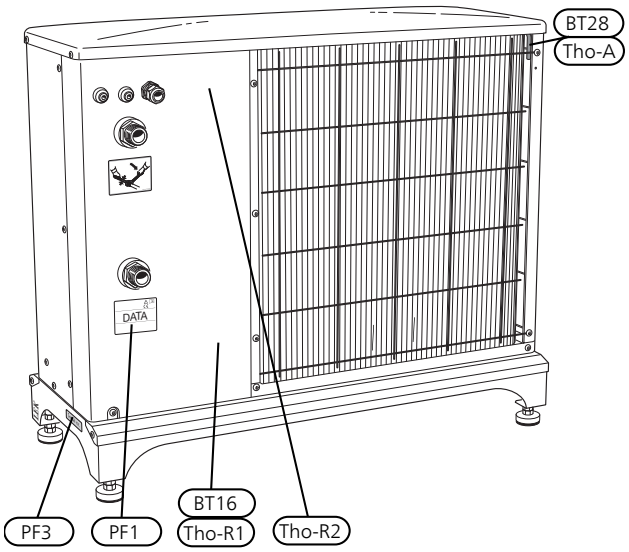

BT28
Tho-A
BT16
Tho-R1
PF3
PF1

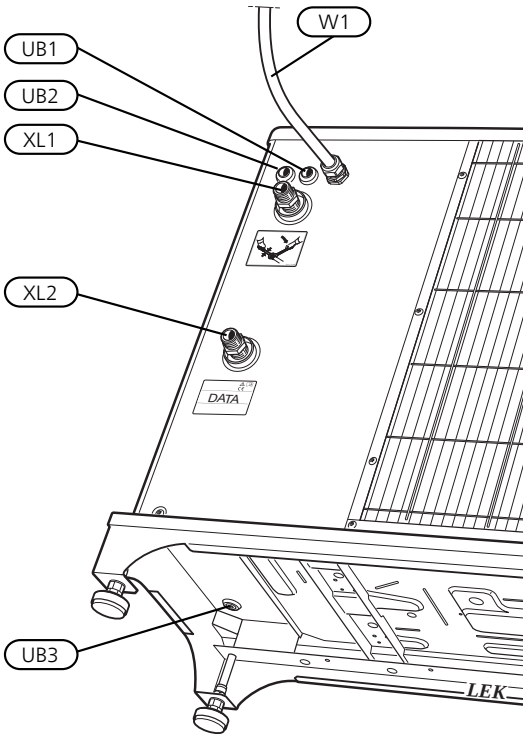

UB1
UB2
XL1
XL2
W1
UB3


BT14
Tho-D
BT12
BP4
QN2
20S
QN1
HS1
BT15
EP2
BT3
QM36
QM37
GQ10
CM
UB3

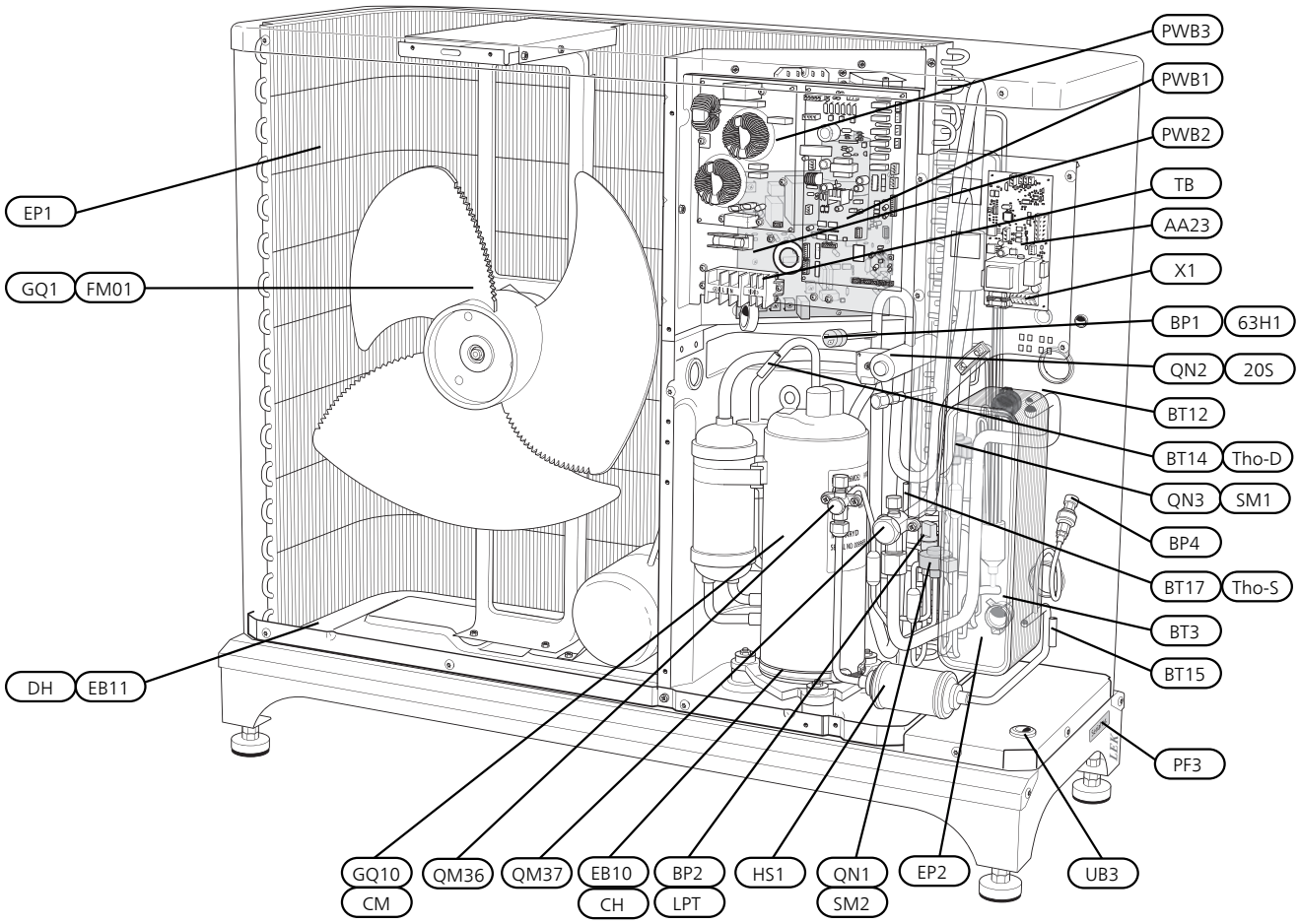
F2040-8

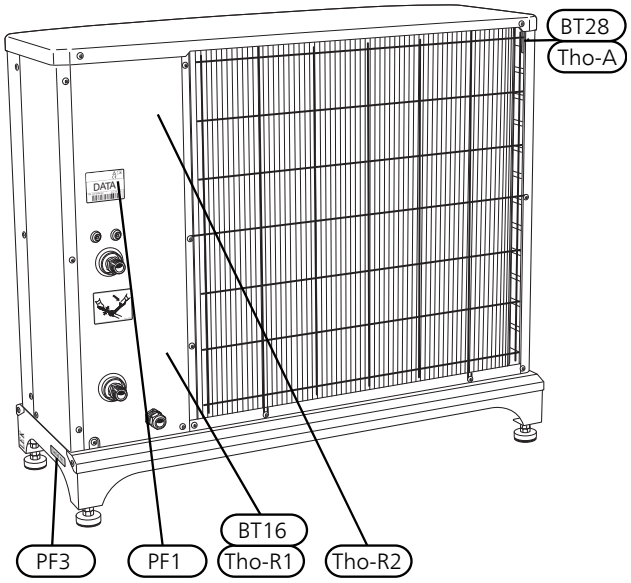

PWB2
BT14
Tho-D
PWB3
PWB1
F
TB
QN2
20S
AA23
BT12
BP1
63H1
X1
BP2
LPT
BP4
EP2
BT17
Tho-S
BT3
QN3
SM1
BT15
HS1
QM36
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FM01
DH
EB11
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CM
QN1
SM2
EB10
CH
UB3

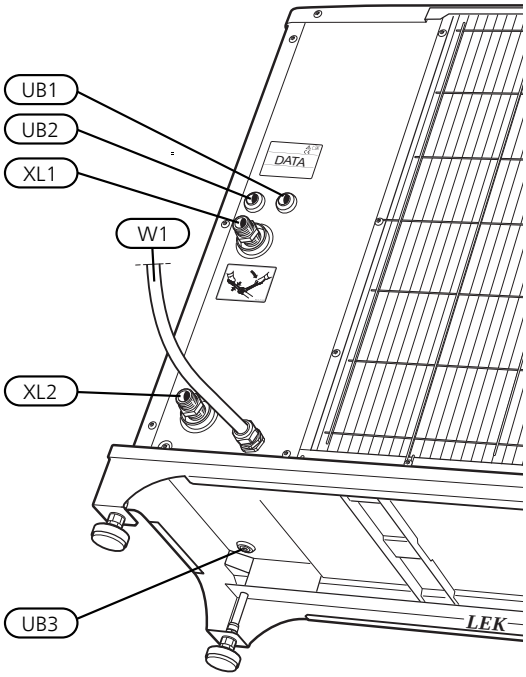

BT28
Tho-A
DATA
PF3
PF1
BT16
Tho-R1
Tho-R2


W1
UB1
UB2
XL1
XL2
DATA
UB3
LEK

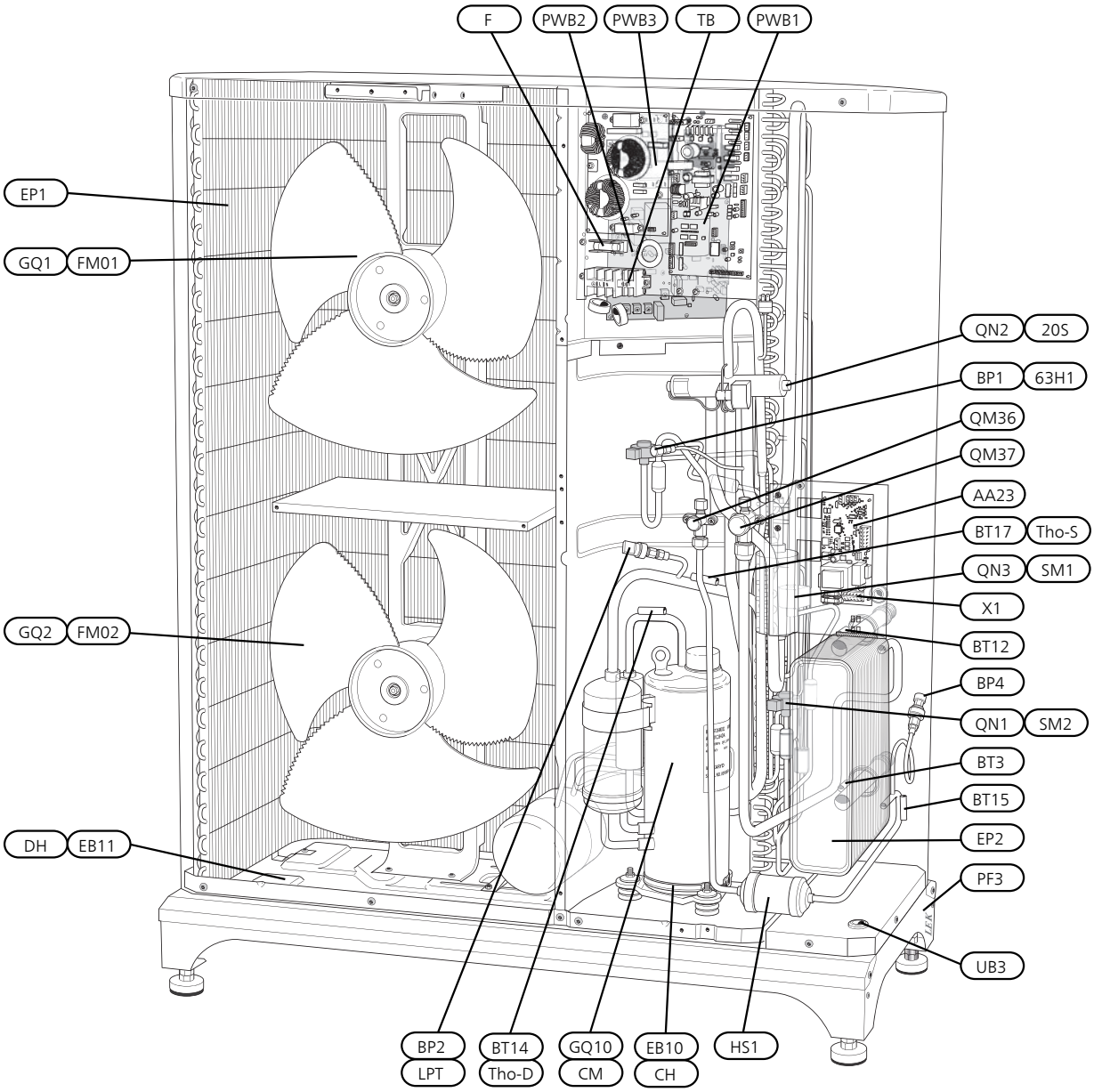
F2040-12

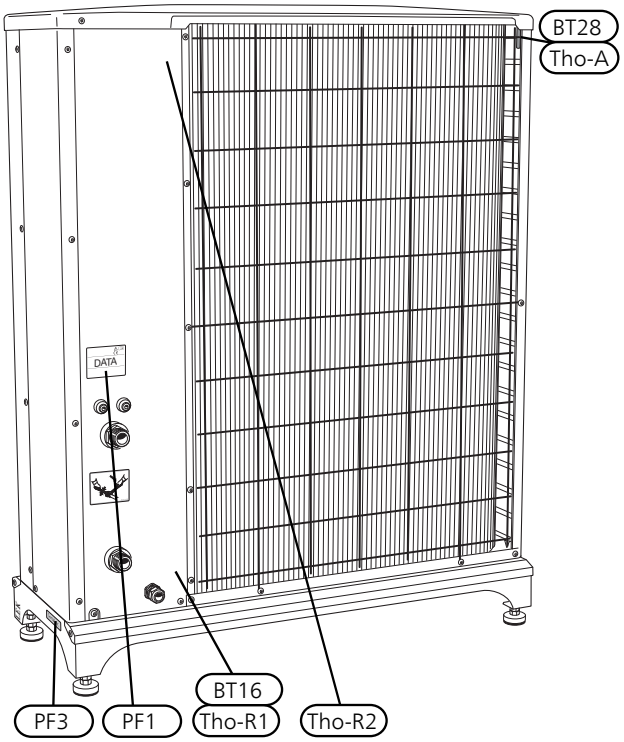

PWB3
PWB1
PWB2
TB
AA23
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BP1
63H1
QN2
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Tho-D
QN3
SM1
BP4
BT17
Tho-S
BT3
BT15
PF3
EP1
GQ1
FM01
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EP2
UB3

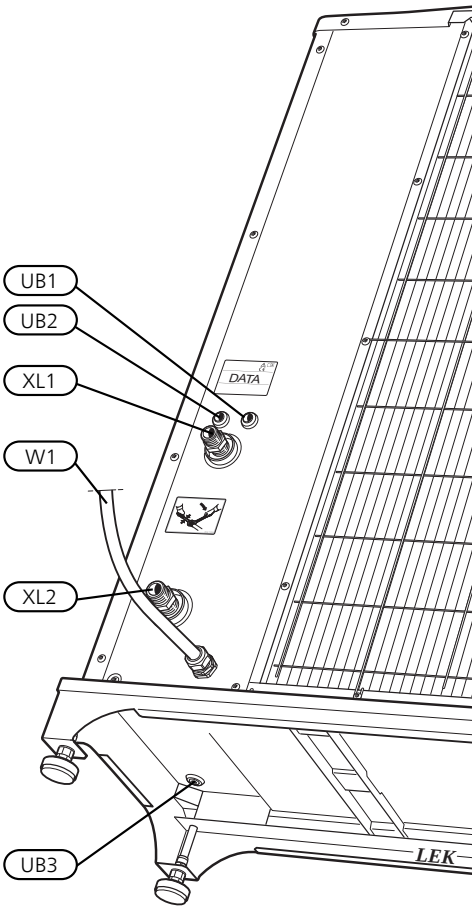

BT28
Tho-A
PF3
PF1
BT16
Tho-R1
Tho-R2


UB1
UB2
XL1
W1
XL2
UB3
DATA
LEK

F2040-16


F
PWB2
PWB3
TB
PWB1
EP1
GQ1
FM01
GQ2
FM02
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EB11
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BT3
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PF3
UB3
BP2
LPT
BT14
Tho-D
GQ10
CM
EB10
CH
HS1


BT28
Tho-A
DATA
BT16
PF3
PF1
Tho-R1
Tho-R2


UB1
UB2
XL1
W1
XL2
UB3
DATA
LEK

LIST OF COMPONENTS F2040

Pipe connections

QM36	Shut-off valve, liquid side
QM37	Shut-off valve, gas side
XL1	Connection, heating medium out from F2040, G1" (Ø28 mm)
XL2	Connection, heating medium in to F2040, G1" (Ø28 mm)

Sensors etc.

BP1 (63H1)	High pressure pressostat
BT3	Temperature sensor, heating medium return line
BT12	Temperature sensor, condenser supply line
BT14 (Tho-D)	Temperature sensor, hot gas
BT15	Temperature sensor, fluid pipe
BT16 (Tho-R1)	Temperature sensor 1, evaporator
BT17 (Tho-S)	Temperature sensor, suction gas
BT28 (Tho-A)	Temperature sensor, ambient
BP2 (LPT)	Low pressure transmitter
BP4	High pressure sensor
Tho-R2	Temperature sensor 2, evaporator

Electrical components

AA23	Communication board
AA23-F3	Fuse for external heating cable (250 mA), max 45 W.
AA23-S3	DIP switch, addressing of outdoor unit
AA23-X1	Terminal block, KVR
AA23-X4	Terminal block, communication from indoor module
AA23-X100	Communication with TB
EB10 (CH)	Compressor heater
EB11 (DH)	Drip tray heater
F	Main fuse compressor unit
GQ1 (FM01)	Fan
GQ2 (FM02)	Fan
(PWB1)	Control board
(PWB2)	Inverter board
(PWB3)	Filter board
RF2	EMC filter for inverter
RF3	EMC filter for incoming supply
(TB)	Terminal block, incoming supply and communication with board AA23

Cooling components

QN2 (20S)	4-way valve
GQ10 (CM)	Compressor
QN3 (SM1)	Expansion valve, cooling
QN1 (SM2)	Expansion valve, heating
EP1	Evaporator (copper pipe with aluminium flange)
EP2	Condenser
HS1	Drying filter

Miscellaneous

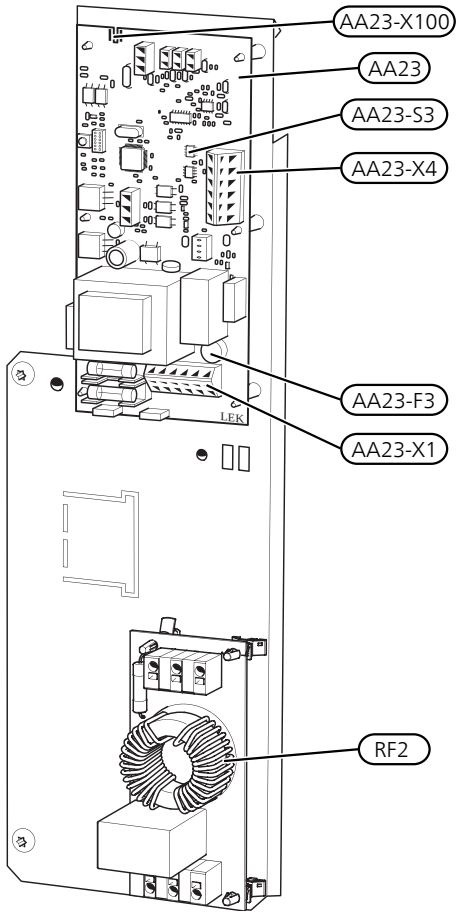
PF1	Type plate
PF3	Serial number
UB1	Cable gland, incoming supply
UB2	Cable grommet, communication
UB3	Cable gland, heating cable (EB14)
W1	Cable, incoming supply

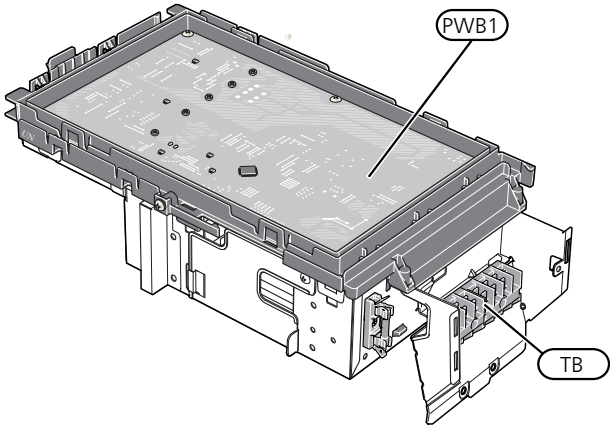
Designations at component positions according to standard EN 81346-2.

Designations within brackets according to the supplier's standard.

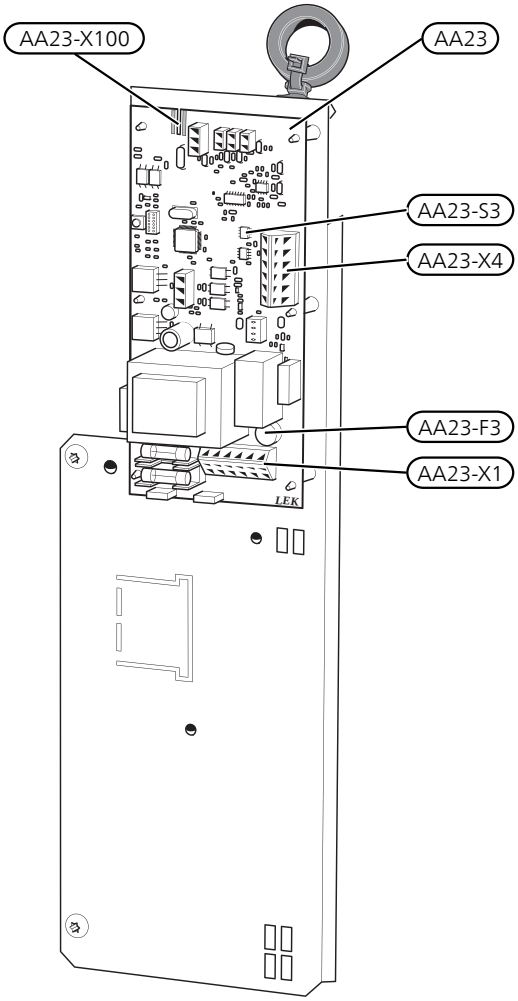
Electrical connection

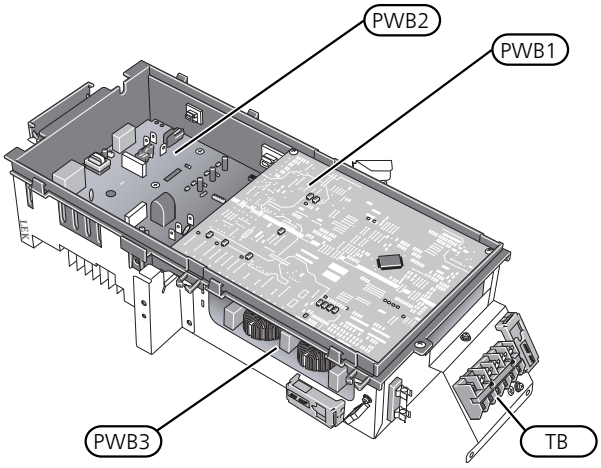
F2040-6

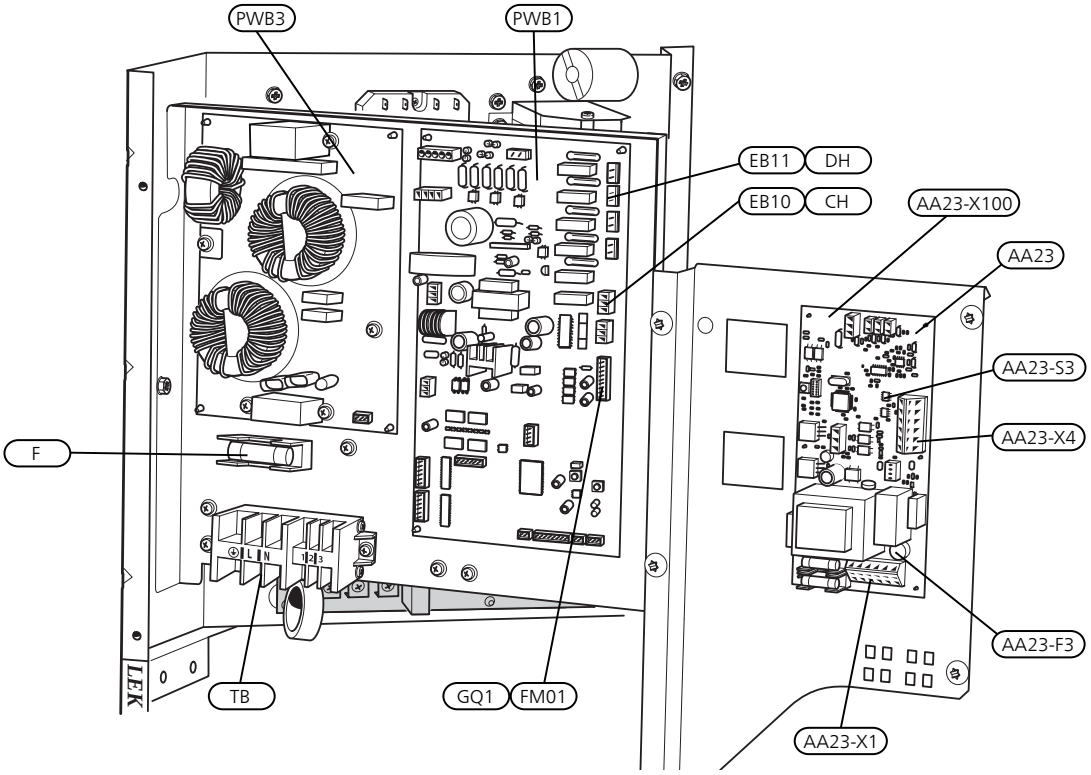


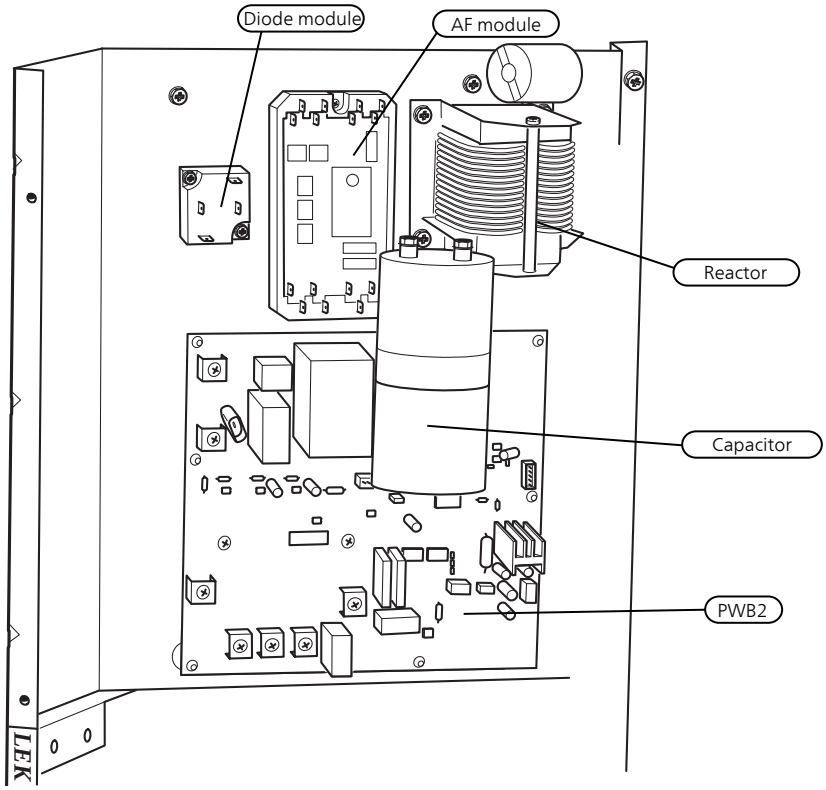


F2040-8

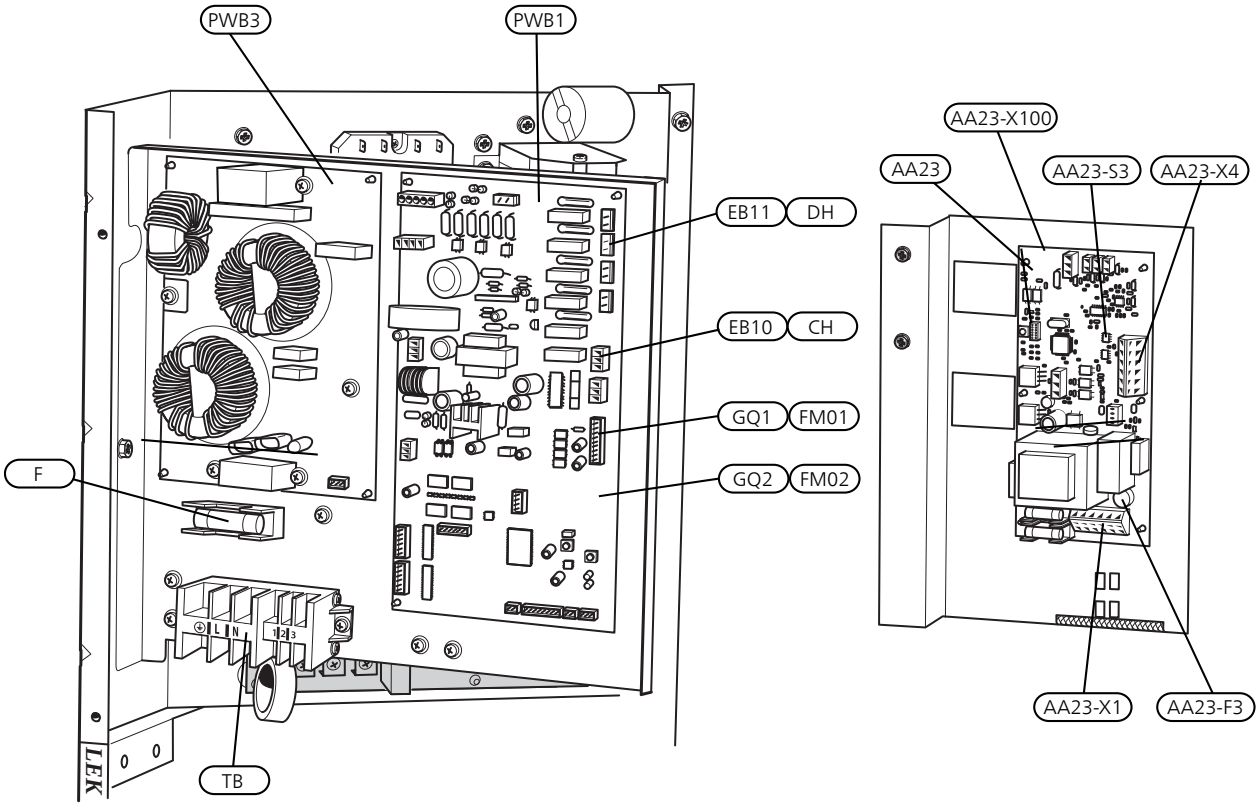


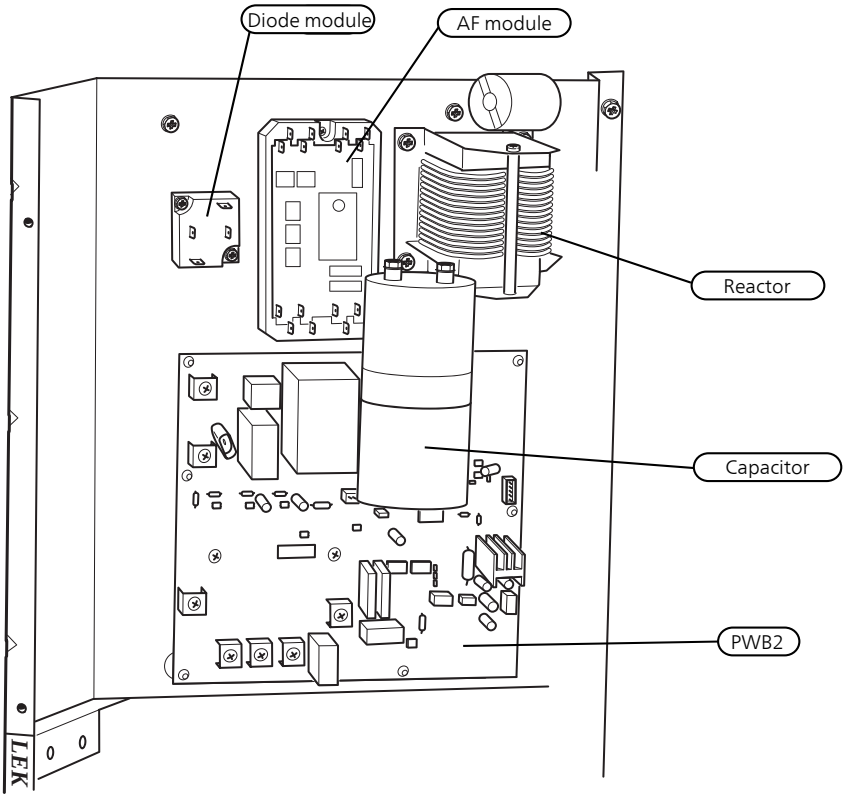



PWB3
PWB1
EB11
DH
EB10
CH
AA23-X100
AA23
AA23-S3
AA23-X4
F
AA23-F3
TB
GQ1
FM01
AA23-X1


Diode module
AF module
Reactor
Capacitor
PWB2

F2040-16


PWB3
PWB1
AA23-X100
AA23
AA23-S3
AA23-X4
EB11
DH
EB10
CH
GQ1
FM01
F
GQ2
FM02
AA23-X1
AA23-F3
TB


Diode module
AF module
Reactor
Capacitor
PWB2

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(PWB3)	Filter board
RF2	EMC filter for inverter
RF3	EMC filter for incoming supply
(TB)	Terminal block, incoming supply and communication with board AA23

Designations at component positions according to standard EN 81346-2.

Designations within brackets according to the supplier's standard.

4 Pipe connections

General

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

F2040 can only operate up to a return temperature of about 55 °C and an outgoing temperature of about 58 °C from the heat pump.

F2040 is not equipped with external shut off valves on the water side; these must be installed to facilitate any future servicing. The return temperature is limited by the return line sensor.

WATER VOLUMES

When docking with F2040 free flow in the climate system is recommended for correct heat transfer. This can be achieved by use of a bypass valve. If free flow cannot be ensured, it is recommended that a buffer tank (NIBE UKV) is installed.

Following water volumes are recommended

F2040	*-6*	*-8*	*-12*	*-16*
Minimum volume, climate system during heating/cooling	20 l	50 l	80 l	150 l
Minimum volume, climate system during under floor cooling	50 l	80 l	100 l	150 l

NOTE

The pipe work must be flushed before the heat pump is connected, so that any contaminants do not damage the components.

Pipe coupling heating medium circuit

- F2040 can be connected to the heating system according to one of the system solutions that can be downloaded from the website www.nibe.co.uk.
- The heat pump must be vented by the upper connection (XL1) using the venting nipple on the enclosed flexible hose.
- Install the enclosed particle filter before the inlet, i.e. the lower connection (XL2) on F2040.
- All outdoor pipes must be thermally insulated with at least 19 mm thick pipe insulation.
- Install shutoff and drain valves so that F2040 can be emptied in the event of prolonged power failures.
- The supplied flexible hoses act as vibration dampers. The flexible pipes are fitted so an elbow is created, thus acting as vibration damping.

Before installing the heat pump in an existing system, it is important that the system is properly flushed through.

Even if the heat pump is to be installed in a new system, the heat pump and system should be flushed.

NOTE

Ensure that cleaning agent has been removed from the entire system before adding inhibitor.

After flushing an inhibitor should be used for long-term anti-corrosion protection.

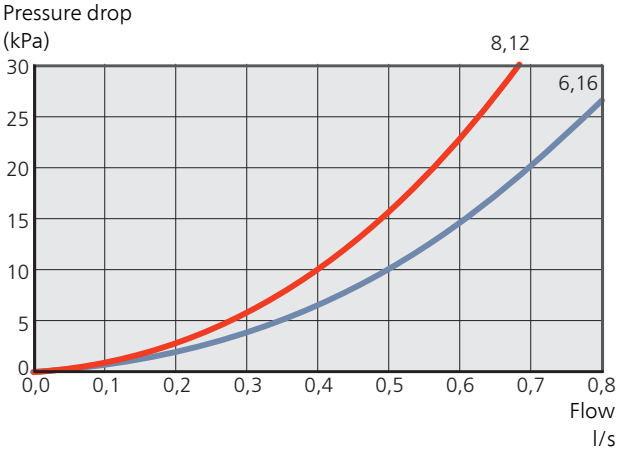
NIBE Energy Systems Limited recommends water treatments (supplied by e.g. Fernox and Sentinel) specifically designed for heat pumps.

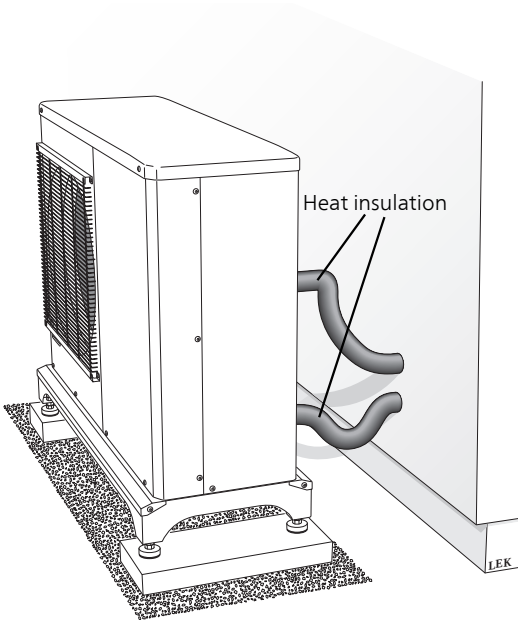
CHARGE PUMP

The charge pump (not included in the product) is powered and controlled from the indoor module/control module. It has a built-in anti-freezing function and must therefore not be switched off when there is a risk of freezing.

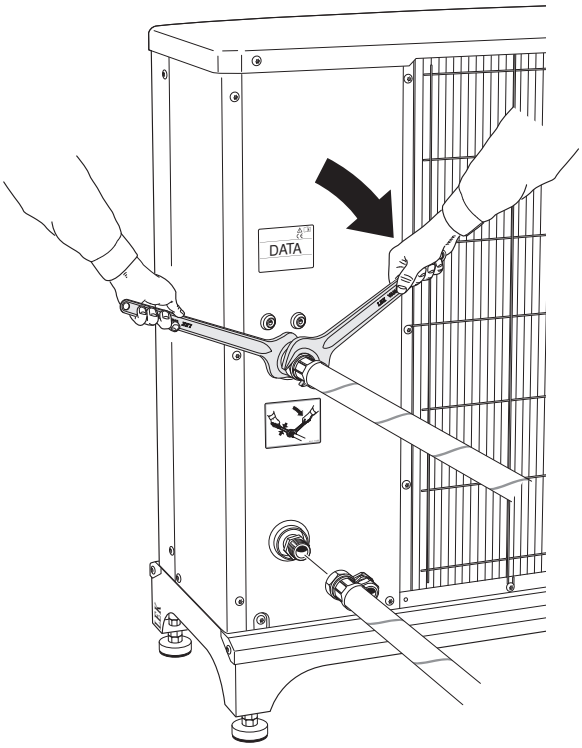
At temperatures below +2 °C the charge pump runs periodically, to prevent the water from freezing in the charge circuit. The function also protects against excess temperatures in the charge circuit.

Pressure drop diagram





Pipe connections flex hose



Docking alternatives

F2040 can be installed with indoor module (VVM) or control module (SMO). The required safety equipment must be installed in accordance with current regulations for all docking options.

The safety equipment must be installed in accordance with current regulations for all docking options.

See www.nibe.co.uk for more docking options.

CONNECTING ACCESSORIES

Instructions for connecting accessories are in the installation instructions provided for the respective accessory. See page 59 for the list of the accessories that can be used with F2040.

5 Electrical connections

General

- The heat pump must not be connected without the permission of the electricity supplier and must be connected under the supervision of a qualified electrician.
- If a miniature circuit-breaker is used, this must have motor characteristic "C" (compressor operation). For MCB size, see "Technical specifications".
- F2040 does not include an omnipolar circuit breaker on the incoming power supply. The heat pump's supply cable (W1) must therefore be connected to a circuit breaker with a breaking gap of at least 3 mm. If the building is equipped with a residual current device, the heat pump should be equipped with a separate one. The residual current device should have a nominal tripping current of no more than 30 mA. Incoming supply must be 230 V 50Hz via electrical distribution units with fuses.
- If an insulation test is to be carried out in the building, disconnect the heat pump.
- Communication cable (W2) is inserted from the rear side through UB2.
- Connect communication cable (W2) from terminal block (AA23-X4) to the indoor module.

NOTE

Electrical installation and any servicing must be carried out under the supervision of a qualified electrician. Disconnect the current with the circuit breaker before carrying out any servicing. Electrical installation and wiring must be carried out in accordance with the national stipulations in force.

NOTE

Check the connections, main voltage and phase voltage before starting the machine to prevent damage to the air/water heat pump's electronics.

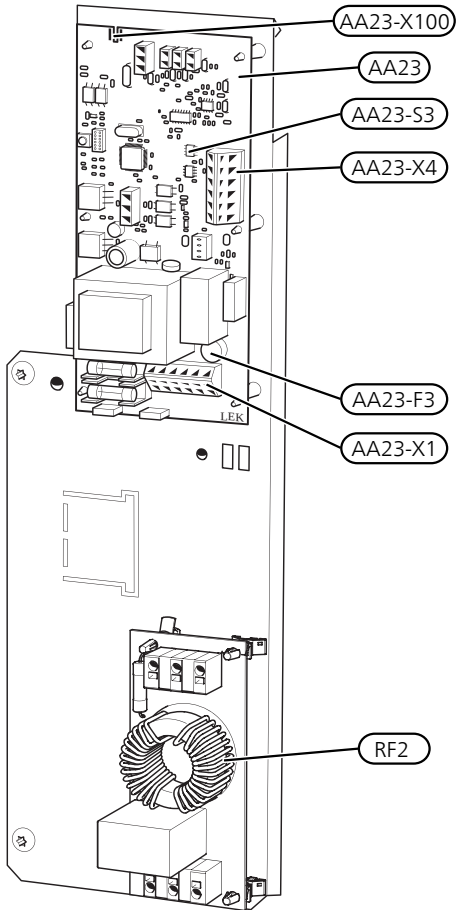
NOTE

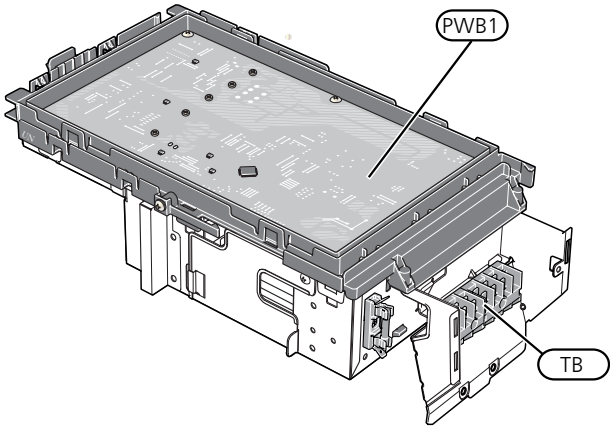
The live external control must be taken into consideration when connecting.

NOTE

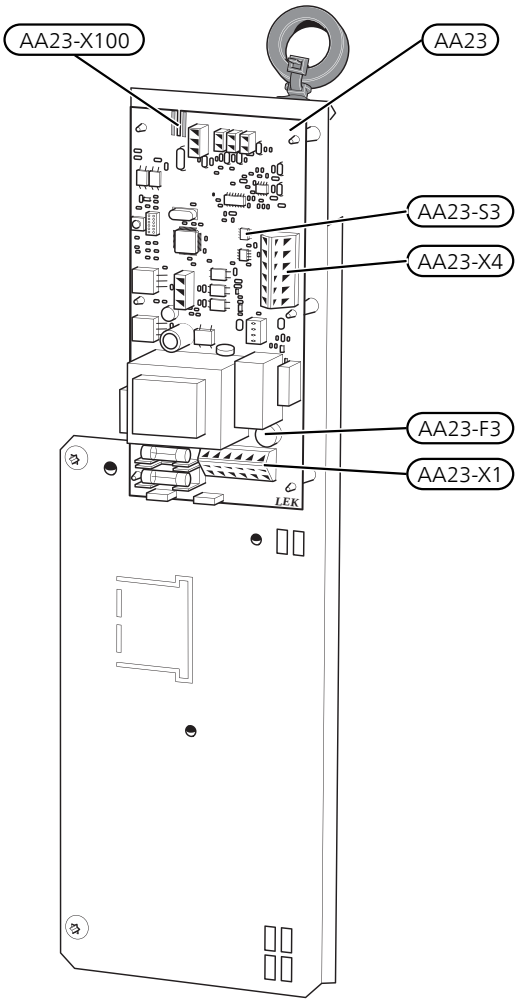
If the supply cable is damaged, only NIBE, its service representative or similar authorised person may replace it to prevent any danger and damage.

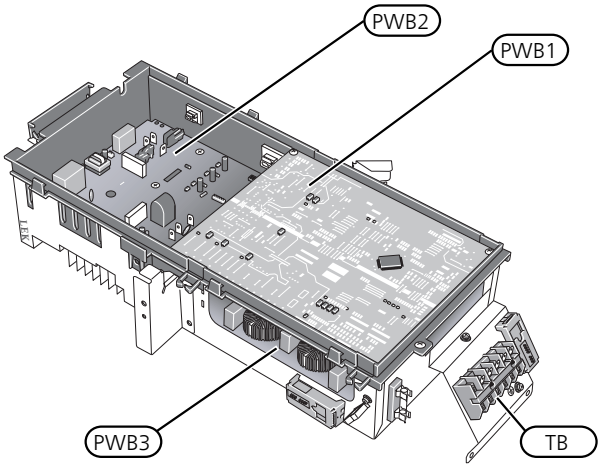
F2040-6



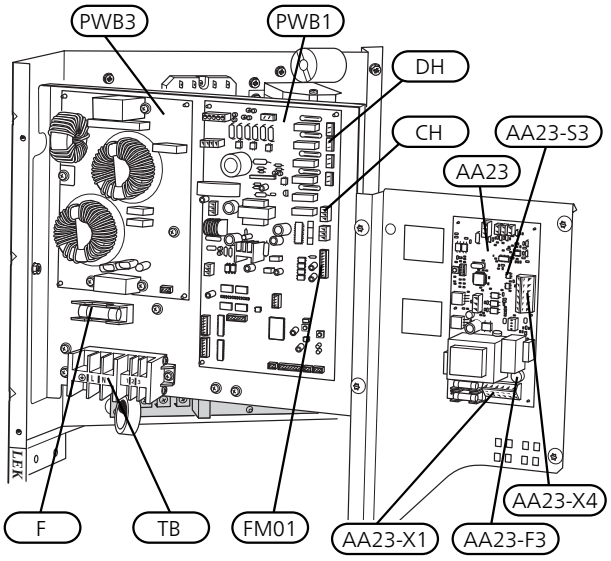


F2040-8

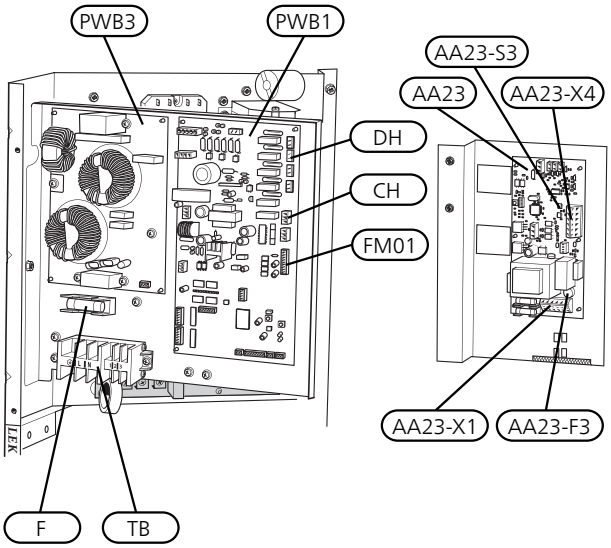


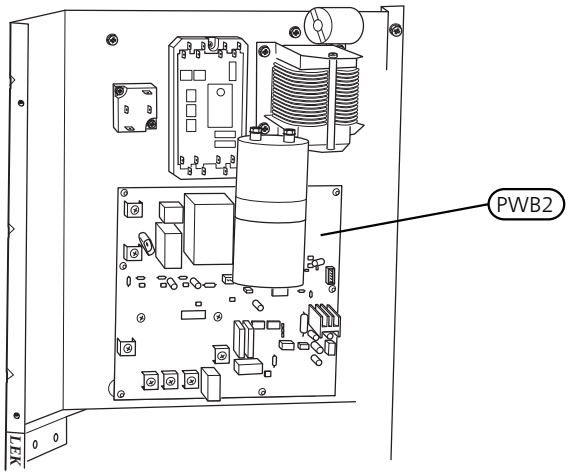


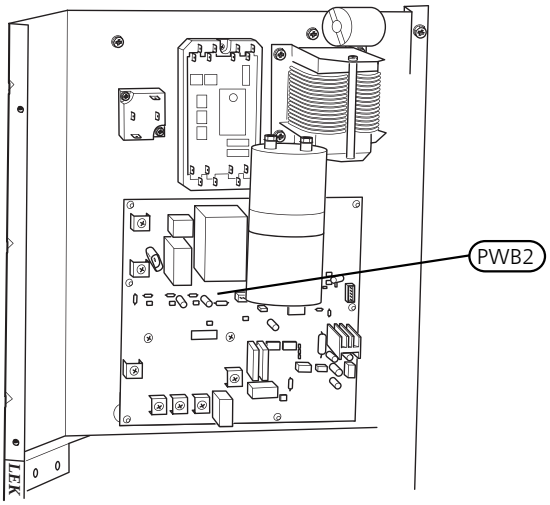
F2040-12



F2040-16





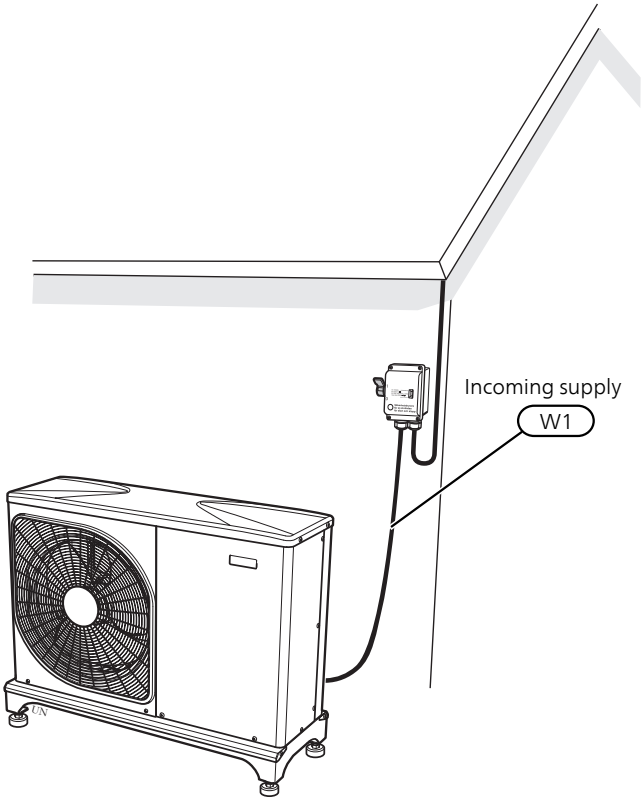


Connections

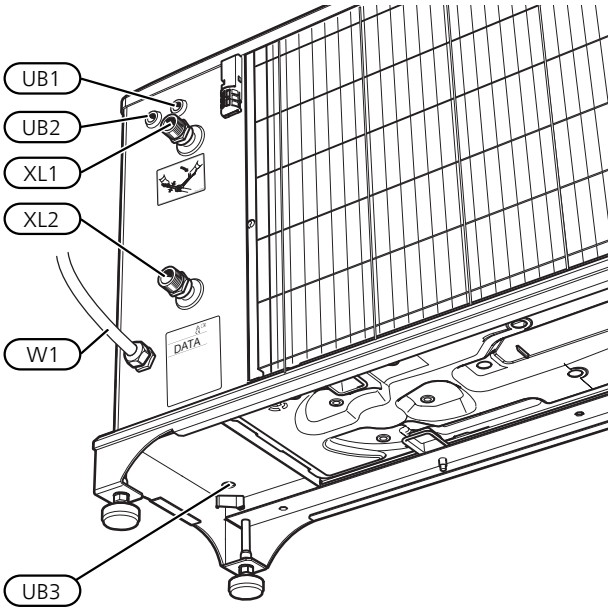
> *NOTE*
>
> To prevent interference, unscreened communication and/or sensor to external connections cables must not be laid closer than 20 cm to high voltage cables when cable routing.

POWER CONNECTION

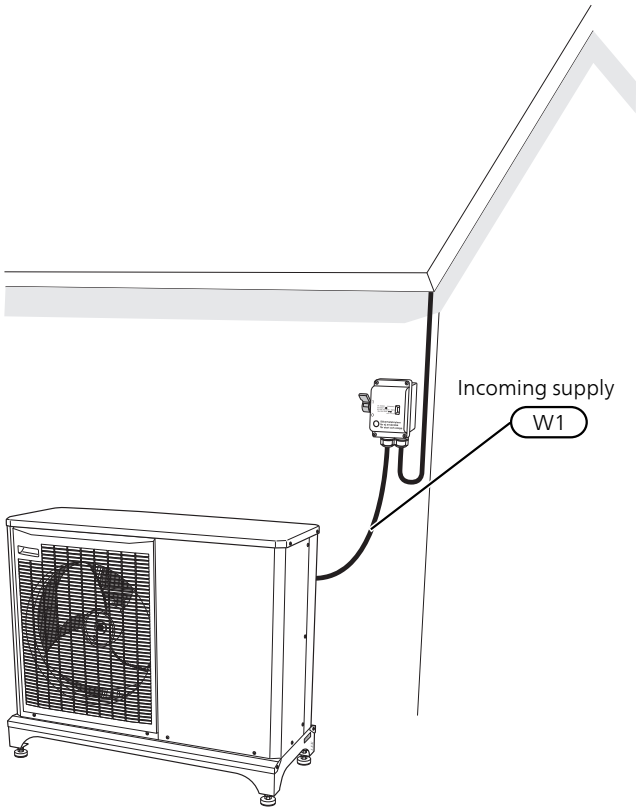
F2040-6

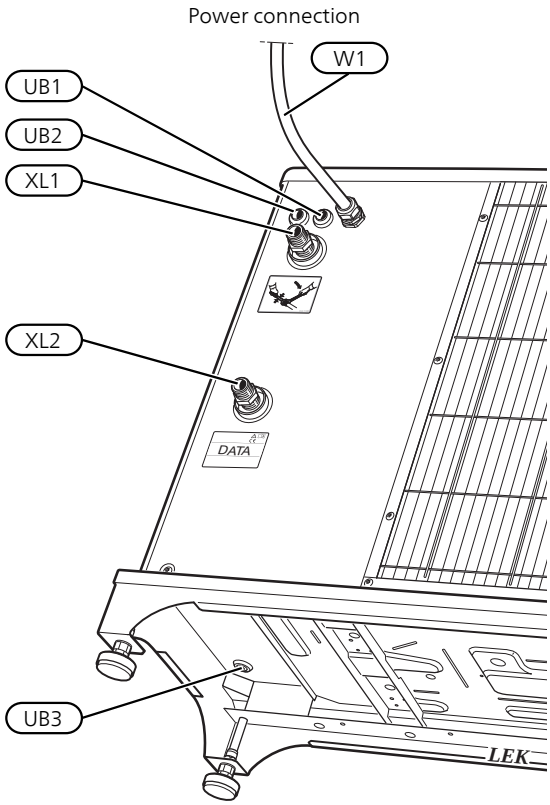


Power connection

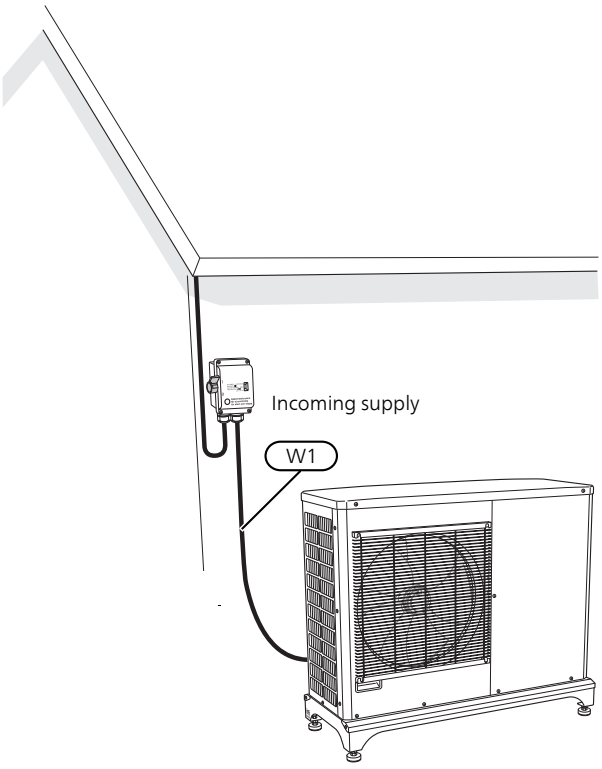


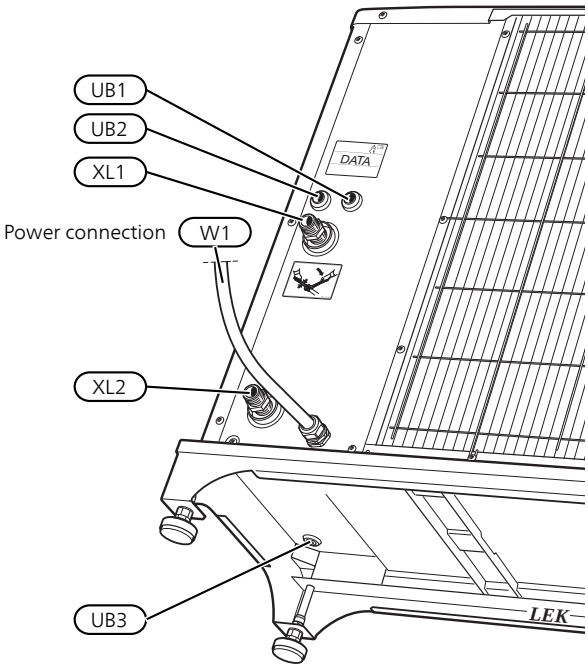
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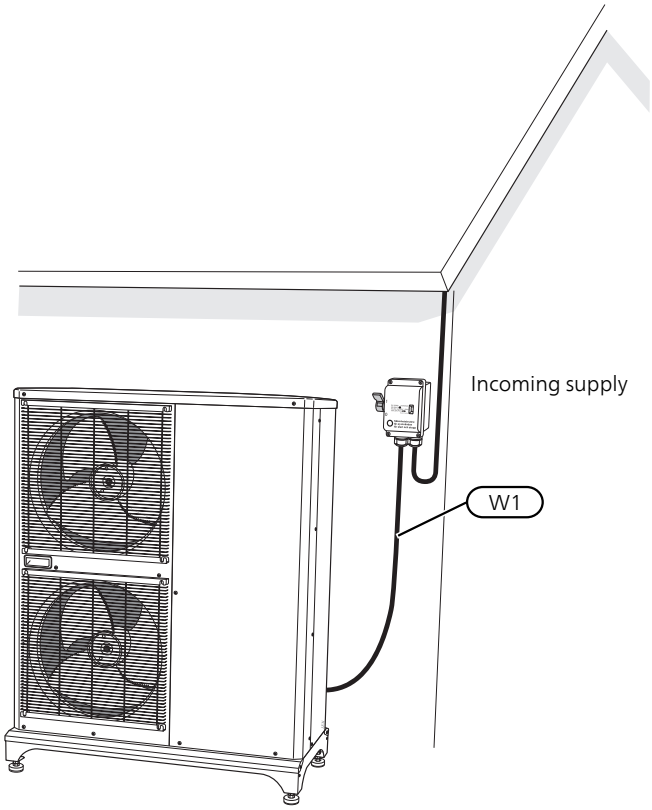


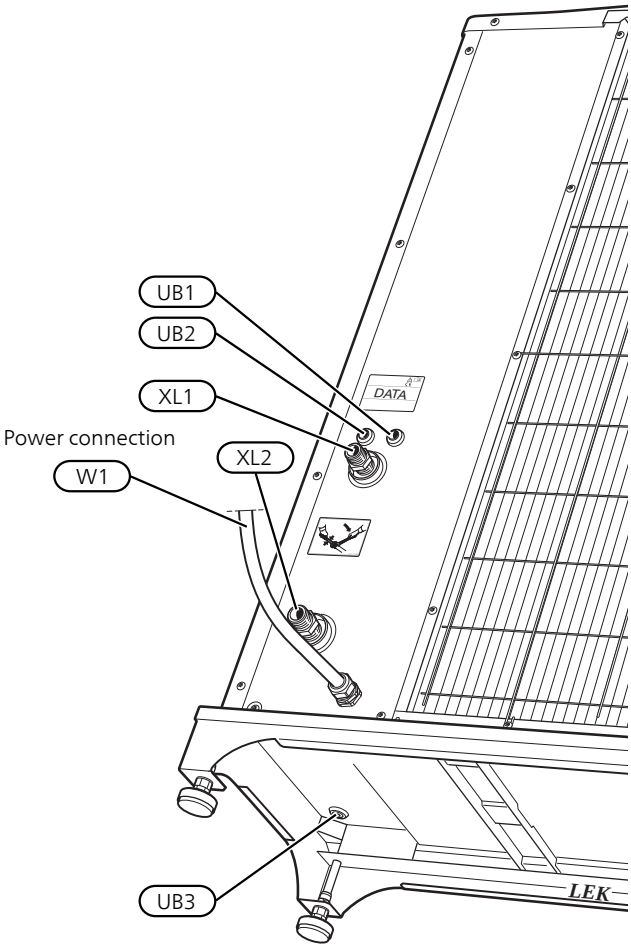


F2040-12









Incoming supply cable (W1) is enclosed and connected to terminal block X1 at the factory. Outside the heat pump there is approx. 1.8 m of cable available.

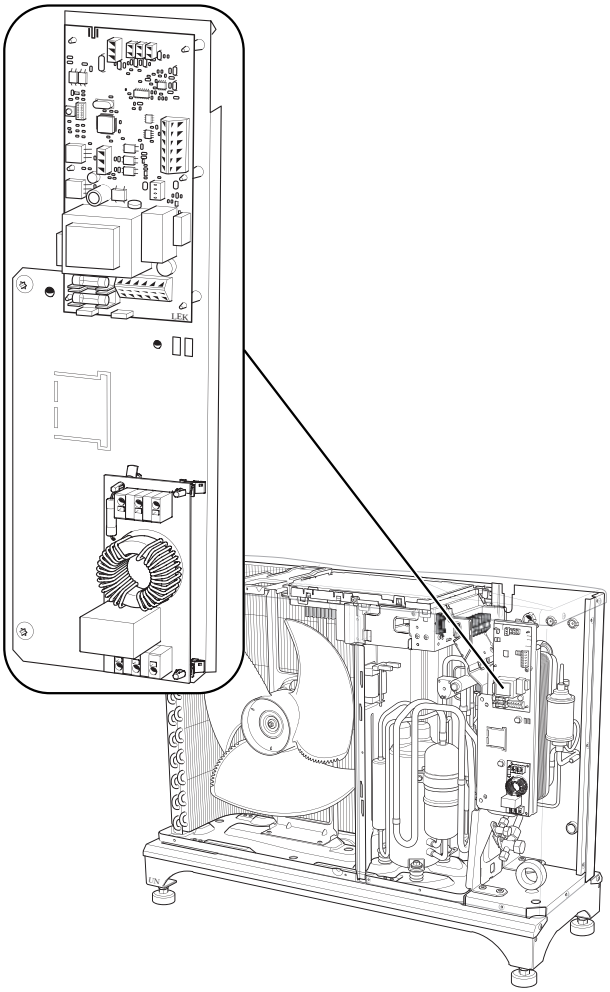
Connect communication cable (W2) (provided by installer) to terminal block AA23-X4 and secure with two cable ties, see image.

For connection of accessory KVR 10, heating cable (EB14) is connected via cable grommet UB3, see External heating cable KVR 10 (Accessory) on page 37.

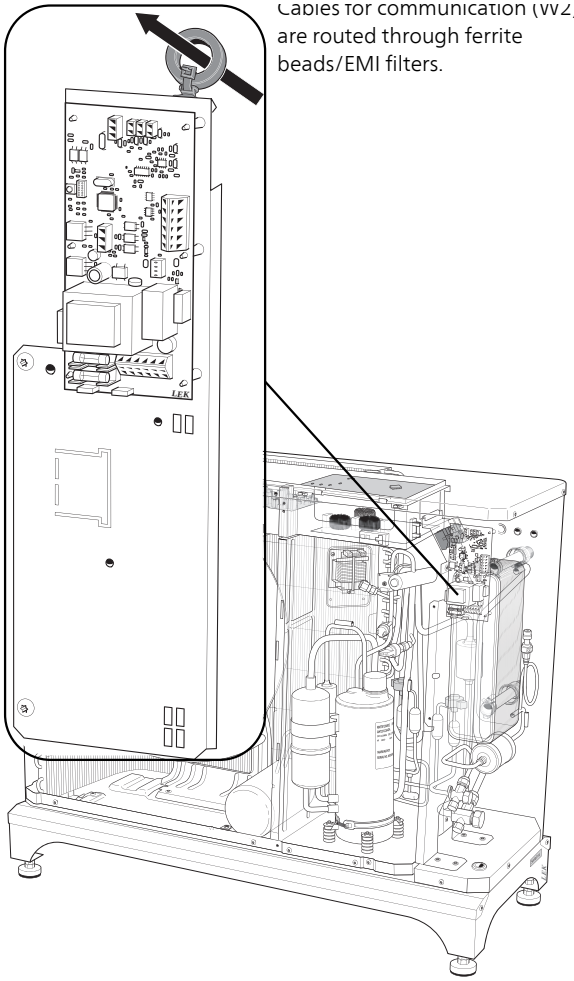
LIST OF COMPONENTS

UB1	Cable grommet, cascade connection
UB2	Cable grommet, communication
UB3	Cable grommet, heating cable (EB14)
W1	Cable, incoming supply

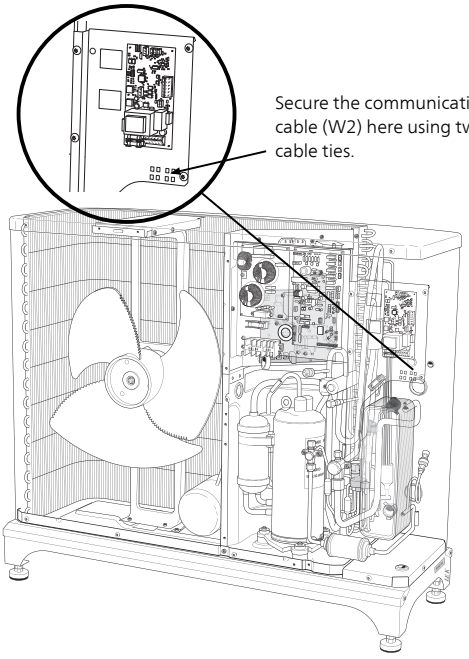
F2040-6



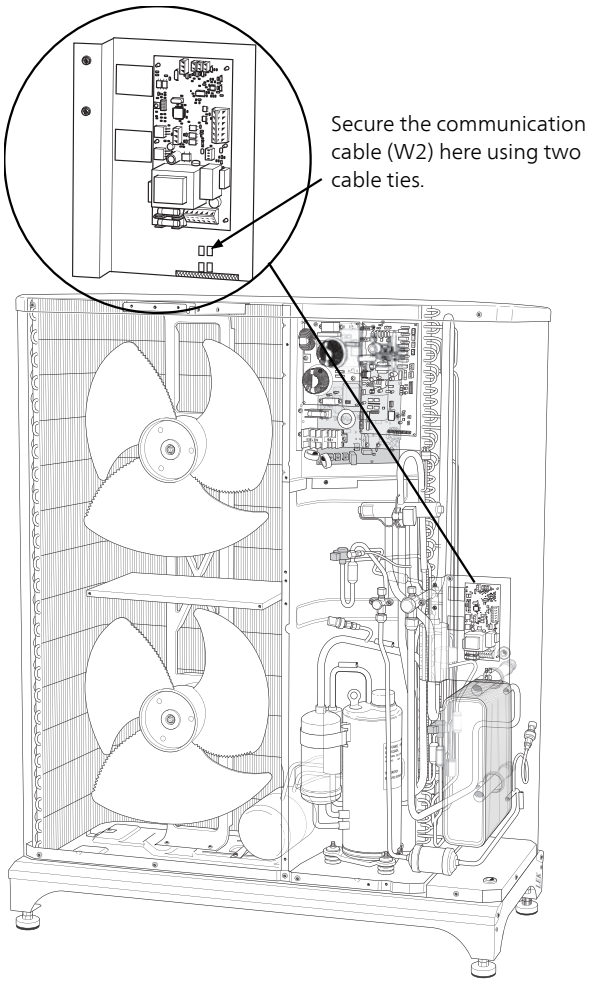
F2040-8



F2040-12



F2040-16



EXTERNAL HEATING CABLE KVR 10 (ACCESSORY)

F2040 is equipped with a plinth for external heating cable EB14 not supplied). The connection is fused with 250 mA (F3 on the communication board AA23). If another cable is to be used, the fuse must be replaced with a suitable one (see table).

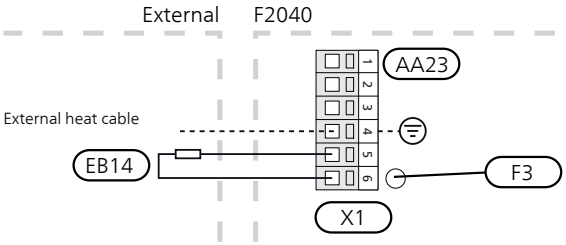
NOTE

Self regulating heating cables must not be connected.

Length, heating cable (m)	*P_{tot} (W)*	*Fuse (F3)*	*Part No.*
1	15	T100mA/250V	718 085
3	45	T250mA/250V	518 900*
6	90	T500mA/250V	718 086

*Fitted at the factory.

Connect external heating cable (EB14) to terminal block X1:4–6 according to following image:



NOTE

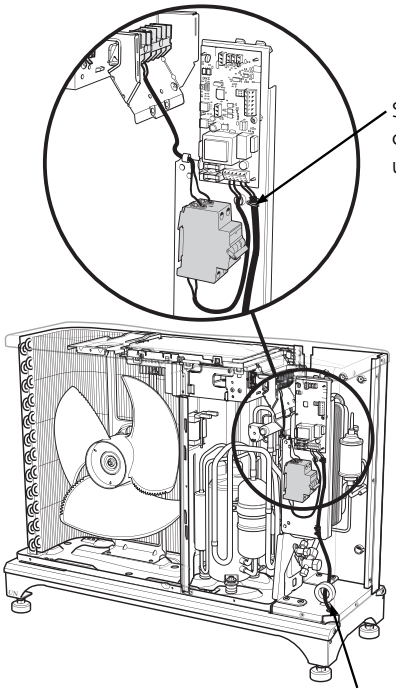
The pipe must be able to withstand the heat from the heating cable.

To ensure this function the accessory KVR 10 should be used.

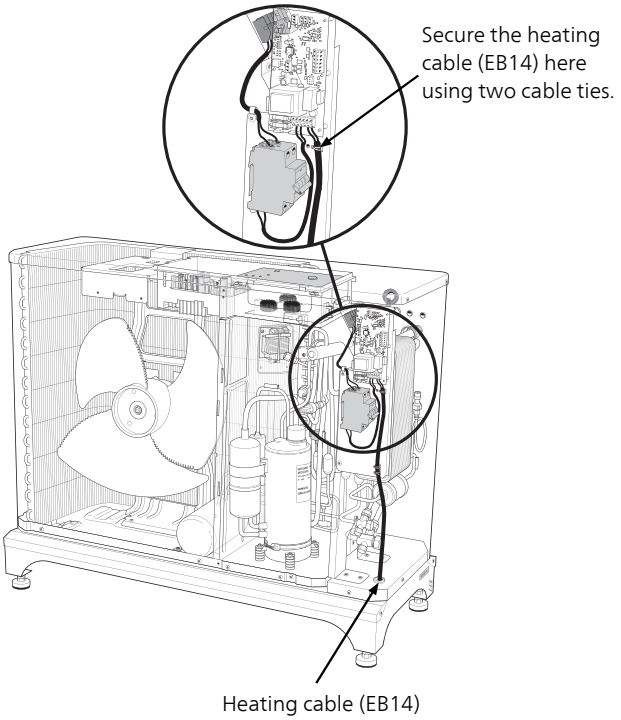
Cable routing

The following images show recommended cable routing from the electrical connection to the condensation pipe. Route the heating cable (EB14) through the gland on the underside and secure with two cable ties at the electrical connection. The transition between the electrical cable and the heating cable must occur after the gland to the condensation pipe.

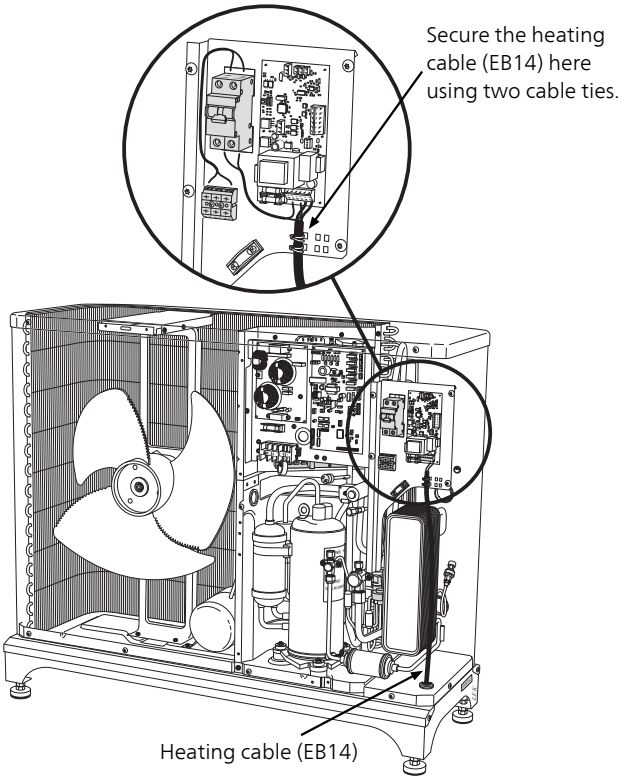
F2040-6



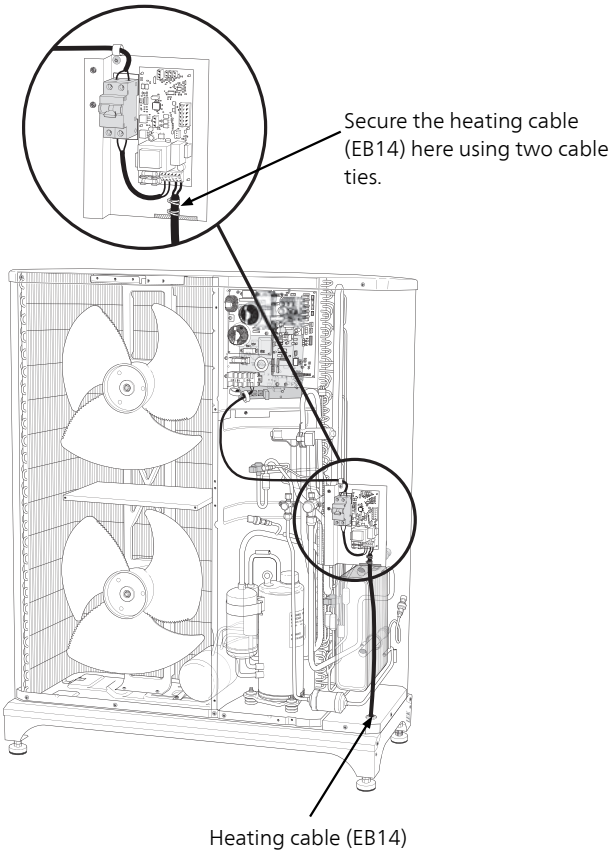
F2040-8



F2040-12



F2040-16

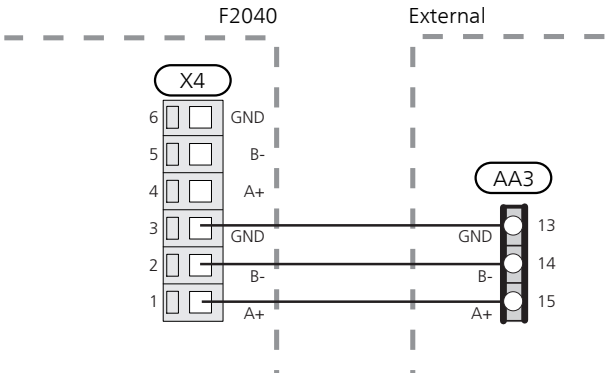


AMBIENT TEMPERATURE SENSOR

An ambient temperature sensor BT28 (Tho-A) is located on the rear of F2040.

COMMUNICATION INDOOR MODULE

F2040 can communicate with NIBE indoor modules, by connecting the indoor module to the terminal block X4:1–3 according to the following image:



NOTE

When installing F2040-6, the NIBE indoor module must have the correct software version. Please ensure that the indoor module, in this case, has at least software version v8320.

For connection of indoor module, see relevant manual on www.nibe.co.uk.

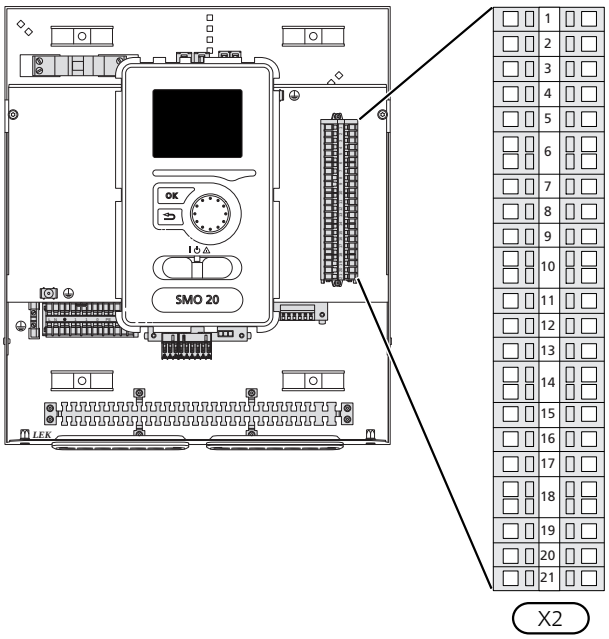
CONNECTION BETWEEN F2040 AND CONTROL MODULE

> *NOTE*
>
> When installing F2040-6, the NIBE control module must have the correct software version. Please ensure that the control module, in this case, has at least software version v8320.

SMO 20

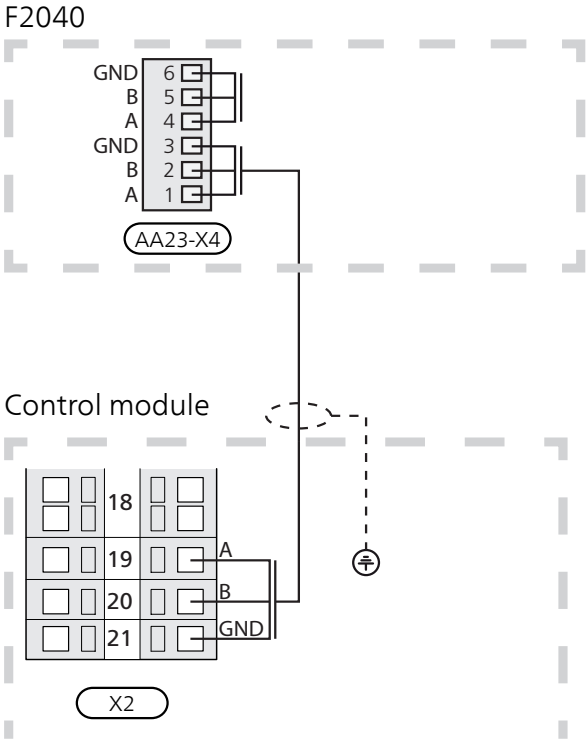
The cable between the units must be connected between terminal block for communication (AA23-X4:1, 2, 3) in F2040 and terminal block for communication (X2-19(A), -20 (B), -21 (GND)) in SMO 20.

Stripped length of conductor is 6 mm.



SMO 20 and F2040

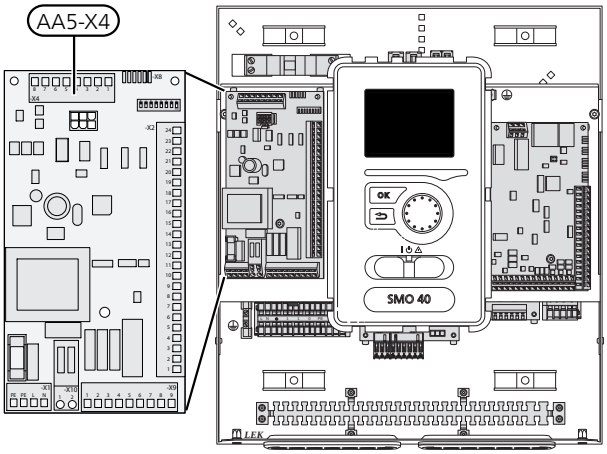
F2040 can communicate with the control module (SMO 20), by connecting to the terminal block in SMO 20, X2-19(A), -20 (B), -21 (GND), according to the following image:



SMO 40

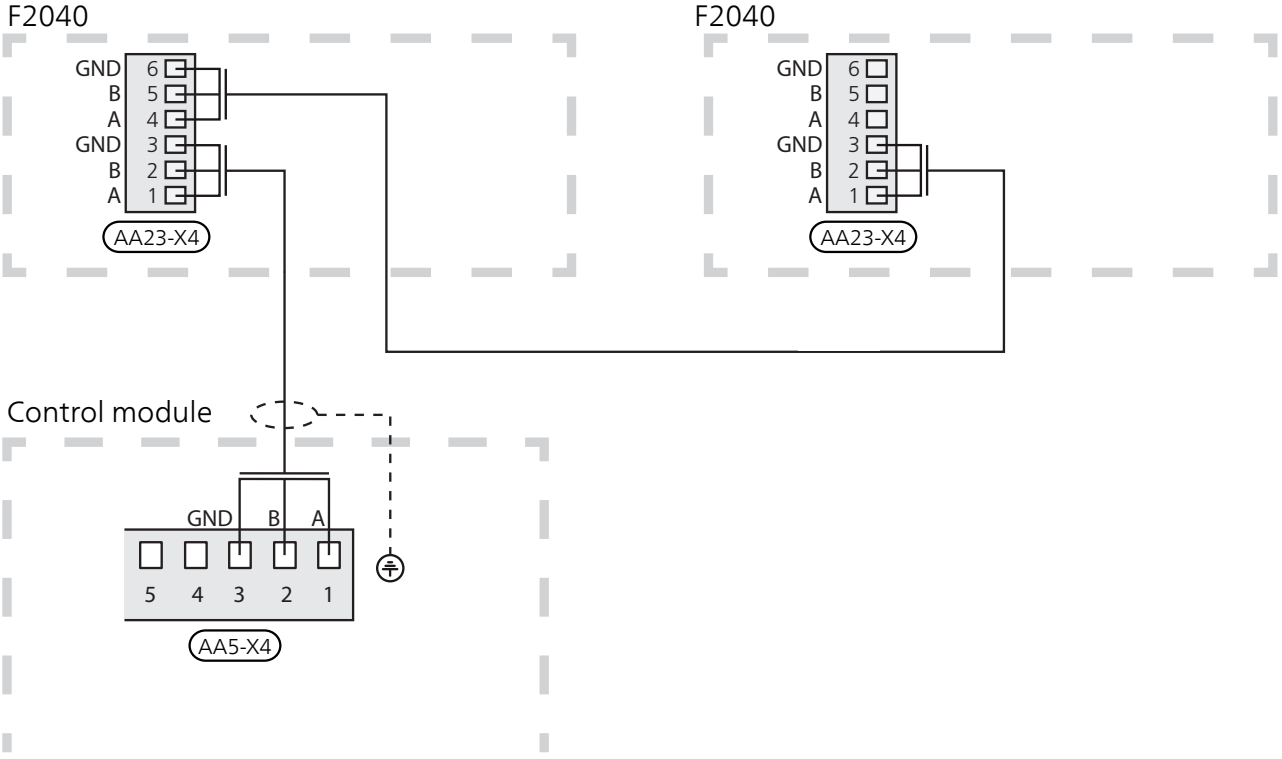
The cable between the units must be connected between terminal block for communication (AA23-X4:1, 2, 3) in F2040 and terminal block for communication (AA5:X4-1(A), -2 (B), -3 (GND)) in SMO 40.

Stripped length of conductor is 6 mm.



SMO 40 and more F2040

F2040 (one or more) can communicate with the control module (SMO 40), by connecting to the terminal block in SMO 40, AA5:X4-1(A), -2 (B), -3 (GND), according to the following image:



ADDRESSING VIA CASCADE CONNECTION

On the communication board (AA23-S3), the communication address is selected for F2040 to the control module. The default address for F2040 is **1**. In a cascade connection, all F2040 must have a unique address. The address is coded in binary.

Address	*S3:1*	*S3:2*	*S3:3*
1	OFF	OFF	OFF
2	On	OFF	OFF
3	OFF	On	OFF
4	On	On	OFF
5	OFF	OFF	On
6	On	OFF	On
7	OFF	On	On
8	On	On	On

6 Commissioning and adjusting

Preparations

- Before commissioning, check that the charge circuit and climate system are filled and well vented.
- Check the pipe system for leaks.

NOTE

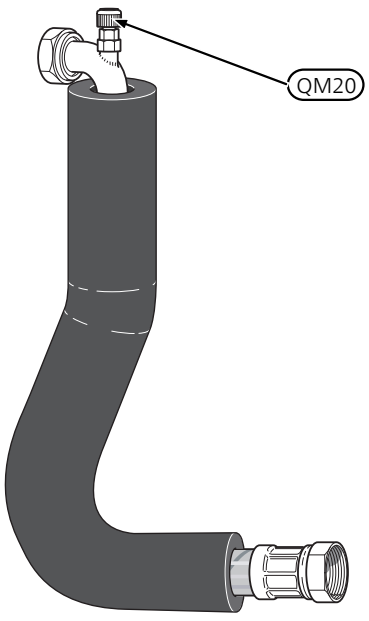
At the time of commissioning, complete all relevant sections of the Benchmark Checklist located at the back of this document.

Completion of the Benchmark Checklist is a condition of warranty. For full terms and conditions of warranty, please see our website www.nibe.co.uk.

Filling and venting

Filling and venting the heating medium system.

1. The heating medium system is filled with water to the required pressure.
2. Vent the system using the venting nipple (QM20) on the enclosed flexible hose and possibly the circulation pump.



Compressor heater

F2040 (does not apply to F2040-6) is equipped with a compressor heater that heats the compressor before start-up and when the compressor is cold.

NOTE

The compressor heater must have been connected for 6 – 8 hours before the first start, see the section "Start-up and inspection" in the Installer Manual for the indoor section

Start-up and inspection

1. The compressor heater (CH) must have been operational for at least 6 - 8 hours before the compressor start can be initiated. This is done by switching on the control voltage and disconnecting the communication cable.
2. F2040 must be addressed if it is to have another address than 1. See chapter Addressing via cascade connection, on page 42.
3. The communication cable on the terminal block AA23-X4 must not be connected.
4. Turn the isolator switch on.
5. Ensure that the F2040 is connected to the power source.
6. After 6 – 8 hours, connect the communication cable (W2) to the terminal block AA23-X4.
7. Restart the indoor module. Follow the instructions for "Start-up and inspection" in the installation manual for the indoor module.

The heat pump starts 30 minutes after the outdoor unit has been powered up and the communication cable (W2) has been connected, if necessary.

If scheduled *silent operation*is required, it must be scheduled in the inner section or control unit.

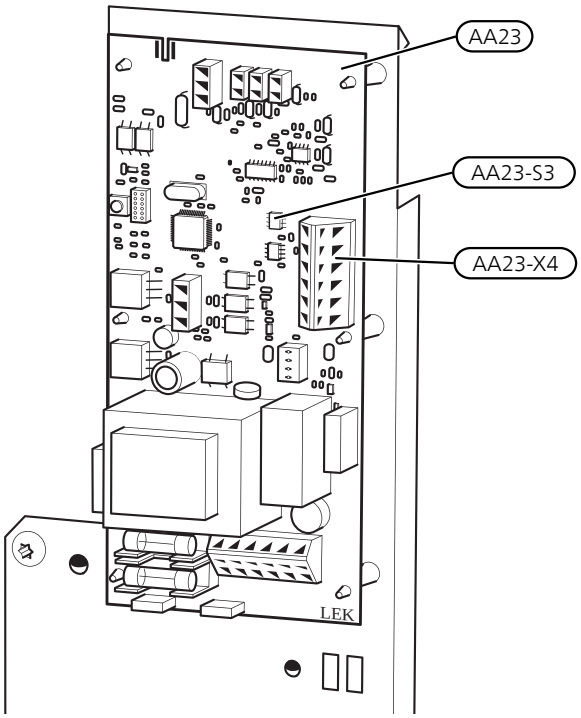
Caution

Silent mode should only be scheduled periodically because the maximum output is limited to approx. the nominal values.

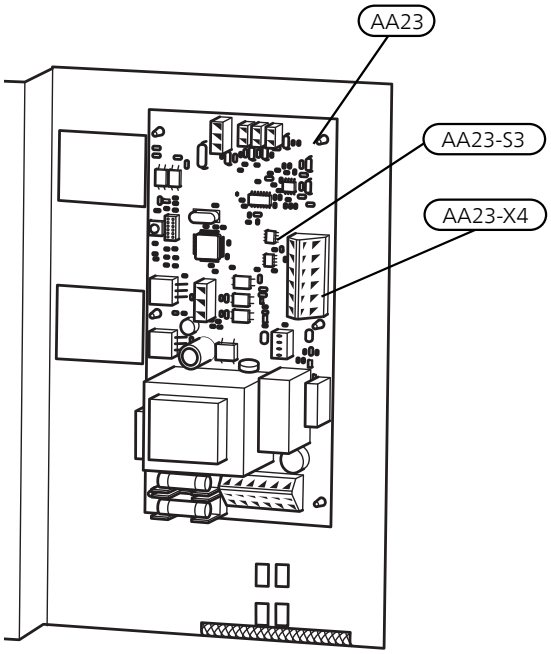
Caution

Do not start any electrical work until at least two minutes after cutting the power.

F2040-6 , -8



F2040-12 , -16



Readjusting, heating medium side

Air is initially released from the hot water and venting may be necessary. If bubbling sounds can be heard from the heat pump, the circulation pump and radiators the entire system will require further venting. When the system is stable (correct pressure and all air eliminated) the automatic heating control system can be set as required.

Adjustment, charge flow

Instructions for adjusting hot water charging are in the Installer Manual for the relevant indoor module. See page 59 for the list of the indoor units and accessories that can be connected to F2040.

7 Control

Menu 5.11.1.1 – Heat pump EB101

These settings are made on the display in the indoor module.

Cooling permitted

Here you can set whether the cooling function is to be activated for the heat pump.

Silent mode permitted

Set whether silent mode is to be activated for the heat pump here.

Current limit

Set whether the current limiting function is to be activated for the heat pump here. During active function you can limit the value of the maximum current.

Setting range: 6 – 32 A

Factory setting: 32 A

Stop temperature compressor

Here you can limit the value for set outdoor temperature down to the value the heat pump is to work.

Setting range -20 – -2 °C

Factory setting -20 °C

blockFreq 1

Select a frequency range within which the heat pump may work here.

blockFreq 2

Select a frequency range within which the heat pump may work here.

8 Servicing and maintenance

Important

The NIBE heat pump requires minimal maintenance but to ensure the continued efficient running of your heat pump and guarantee in the warranty period it is recommended that it is checked and serviced annually by a qualified engineer.

Any servicing must be carried out by a competent person.

When replacing a part on the appliance, use only spare parts supplied by NIBE.

If any electrical connections have been disconnected and re-connected, checks for earth continuity must be tested for with a suitable multimeter.

On completion the Benchmark service record should be completed.

General inspection

Check the following:

1. Condition of casing
2. Check Inlet grille is not clogged with leaves
3. Check fan for any obstructions
4. Electrical supply connections
5. Water connections
6. Heating system pressure
7. Alarm log

Correct any fault before continuing.



NOTE

Before removing any covers or replacing parts the heat pump must be isolated from the mains electrical supply.

Heating System

1. Inspect start and stop temperatures. Correct if required.
2. Inspect heat curve (SMO & VVM only). Correct if required.
3. Check the heating system flow temperatures, the difference should be between 5-10°C. Adjust flow if required.
4. Inspect the heat pump charge flow temperature difference against charge flow with graphs on page 18. Adjust if required.



NOTE

After servicing, complete the relevant Service Interval Record section of the Benchmark Checklist located at the back of this document.

Completion of the Service Interval Record is a condition of warranty. For full terms and conditions of warranty, please see our website www.nibe.co.uk.

9 Disturbances in comfort

Troubleshooting

NOTE

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

NOTE

As F2040 can be connected to a large number of external units, these should also be checked.

NOTE

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

Caution

Alarms are acknowledged on the indoor module / control module (VVM / SMO).

The following tips can be used to rectify comfort disruption:

BASIC ACTIONS

First and foremost

Start by checking any alarm messages in the info menu on the indoor module (VVM) / control module (SMO). Follow the instructions on the display on the indoor module (VVM) / control module (SMO).

F2040 not in operation

F2040 communicates all alarms to the indoor module/control module (VVM / SMO).

- Ensure that the F2040 is connected to the power source and that compressor operation is required.
- Check the indoor module/control module (VVM / SMO). See section "Disturbances in comfort" in the Installer Manual for the indoor module/control module (VVM / SMO).

F2040 does not communicate

- Check that the addressing of F2040 is correct.
- Check that the communication cable is correctly connected and working.

Further possible measures

If any components are disconnected from the power.

Start by checking the following items:

- That the heat pump is running or that the supply cable to F2040 is connected.
- Group and main fuses of the accommodation.
- The heat pump's fuse (F).
- The property's earth circuit breaker.

LOW HOT WATER TEMPERATURE OR A LACK OF HOT WATER

Caution

The hot water is always set on the indoor module (VVM) or the control module (SMO).

This part of the fault-tracing chapter only applies if the heat pump is docked to the hot water heater.

- Large hot water consumption.
  - Wait until the hot water has heated up.
- The hot water settings are adjusted on the display on the indoor module / control module.
  - See the manual for the indoor module or control module.
- Clogged particle filter.
  - Check whether alarm "high condenser out" (162) is an information message. Check and clean the particle filter.

LOW ROOM TEMPERATURE

- Closed thermostats in several rooms.
  - Set the thermostats to max in as many rooms as possible.
- Incorrect settings in indoor module or control module.
  - See the manual for the indoor module / control module (VVM / SMO).
- Incorrect flow across the heat pump.
  - Check whether alarm "high condenser in" (163) or "high condenser out" (162) are info messages. Follow the instructions for adjusting charge flow.

HIGH ROOM TEMPERATURE

- Incorrect settings in indoor module or control module.
  - See the manual for the indoor module or control module.

LARGE AMOUNT OF WATER BELOW F2040

Check that the water drainage via the condensation pipe (KVR 10) is working.

SENSOR PLACEMENT

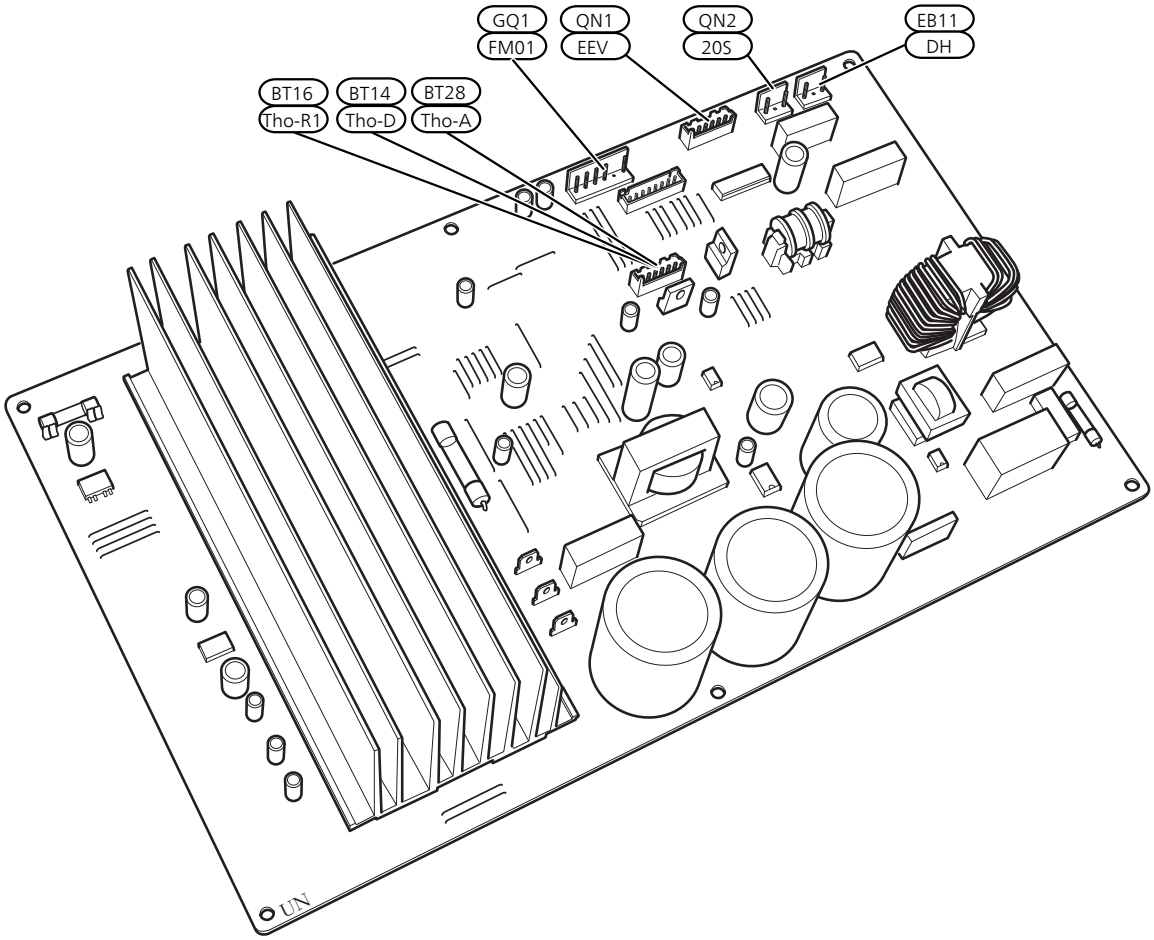
Sensors etc.

BE1 (CT)	Current sensor
BP1 (63H1)	High pressure pressostat
BP2 (LPT)	Low pressure transmitter
BP4	High pressure sensor
BT3	Temperature sensor, heating medium return line
BT12	Temperature sensor, condenser supply line
BT14 (Tho-D)	Temperature sensor, hot gas
BT15	Temperature sensor, fluid pipe
BT16 (Tho-R1)	Temperature sensor, heat exchanger, 1
BT17 (Tho-S)	Temperature sensor, suction gas
BT28 (Tho-A)	Temperature sensor, ambient
EB10 (CH)	Compressor heater
EB11 (DH)	Drip tray heater
EP2	Condenser
GQ1 (FM01)	Fan
GQ10 (CM)	Compressor
HS1	Drying filter
QN1 (EEV)	Expansion valve
QN1 (SM2)	Expansion valve, heating
QN2 (20S)	4-way valve
QN3 (SM1)	Expansion valve, cooling
Tho-R2	Temperature sensor, heat exchanger, 2

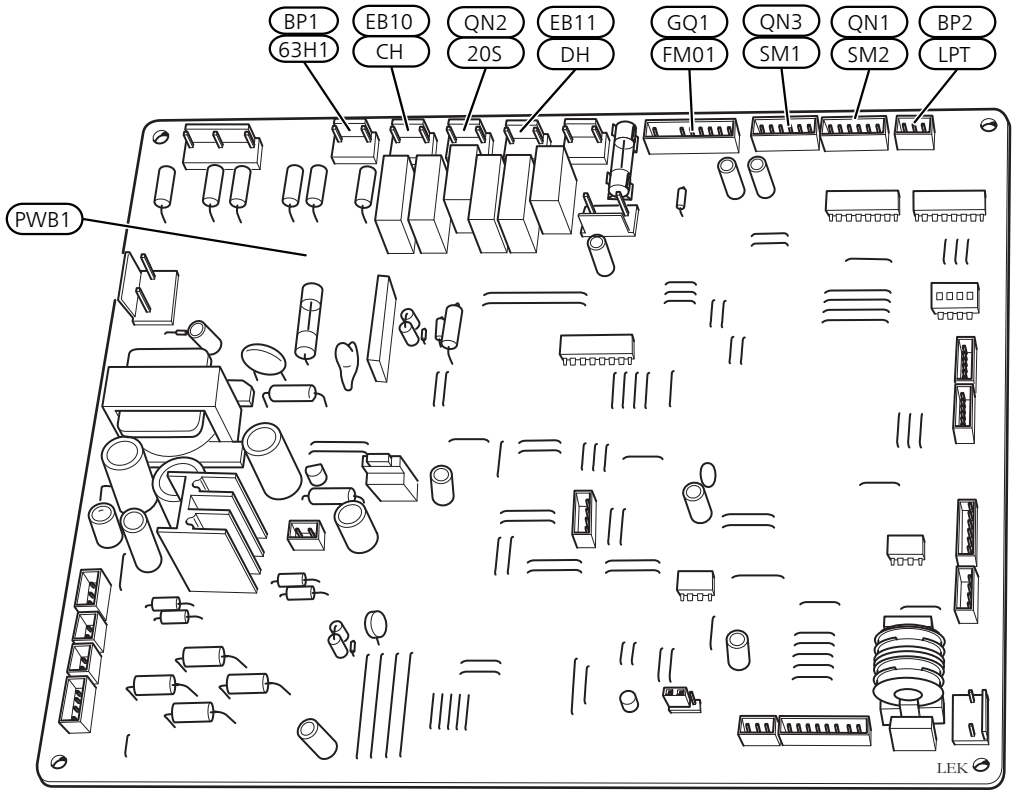
Designations at component positions according to standard EN 81346-2.

Designations within brackets according to the supplier's standard.

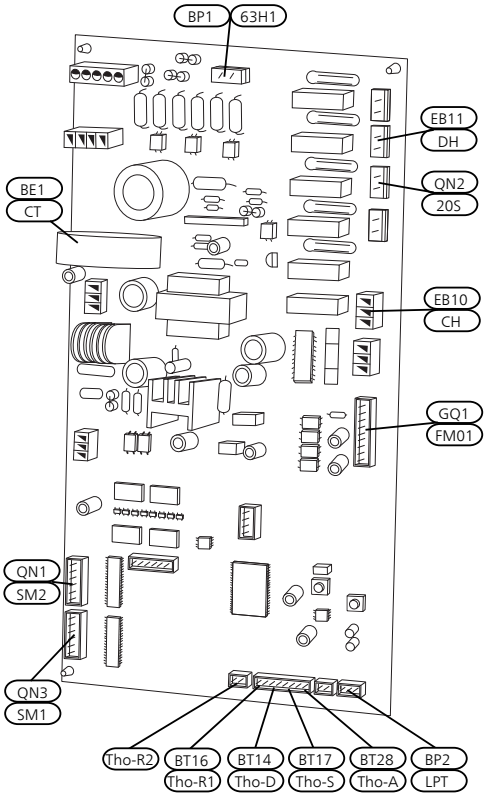
Connection to board (PWB1)
F2040-6



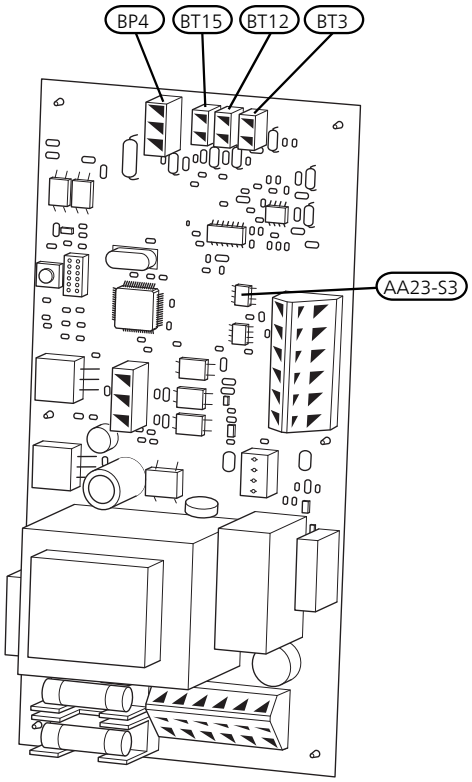
F2040-8



F2040-12 /F2040-16

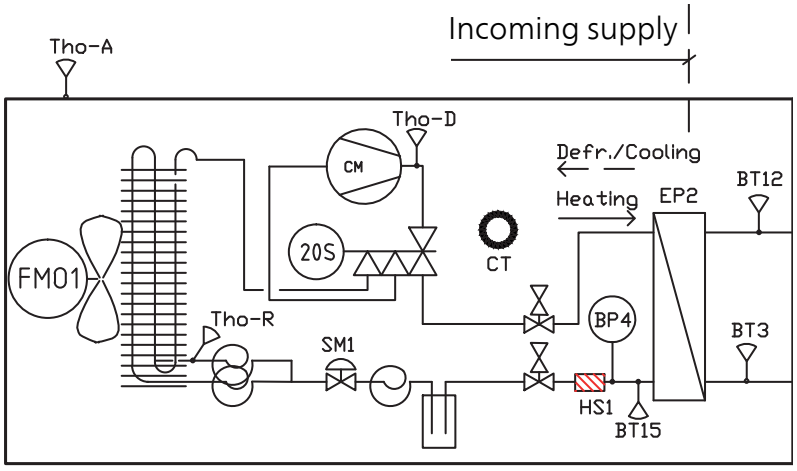


Connection to board (AA23)

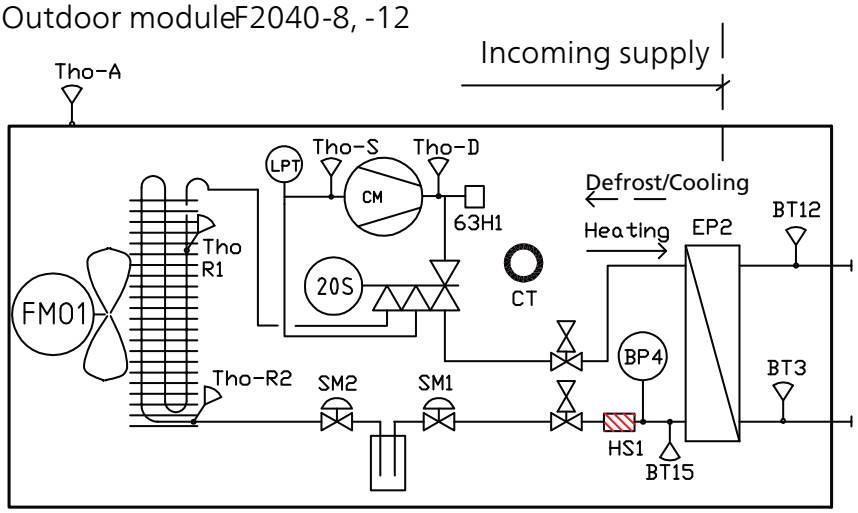


Sensor placement in F2040

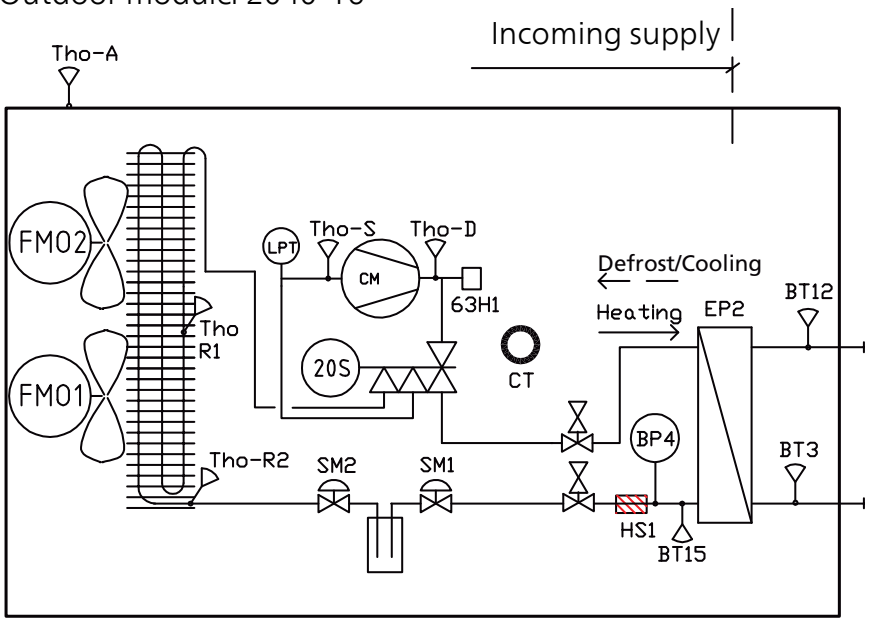
Outdoor moduleF2040-6



Outdoor moduleF2040-8, -12

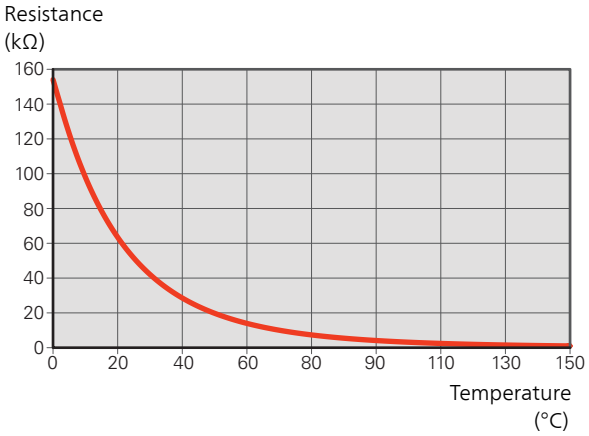


Outdoor moduleF2040-16

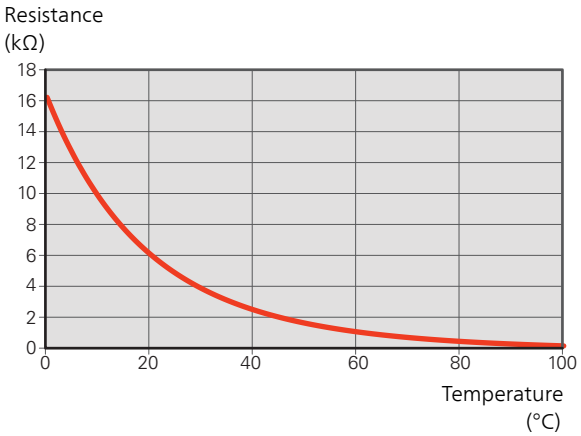


Data for temperature sensor in F2040-6

Tho-D

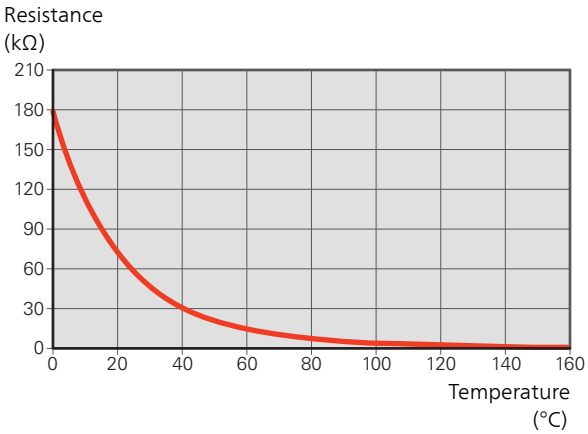


Tho-A, R

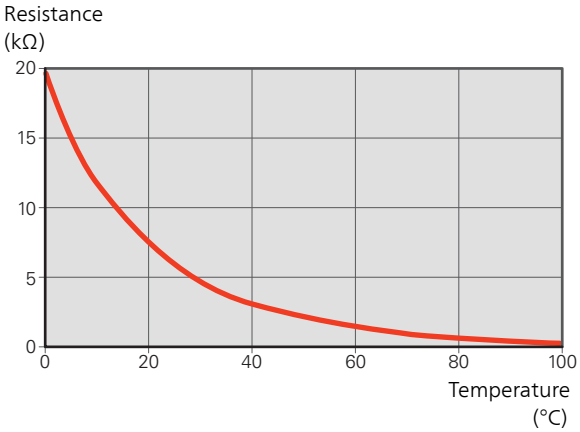


Data for temperature sensor in F2040-8, -12, -16

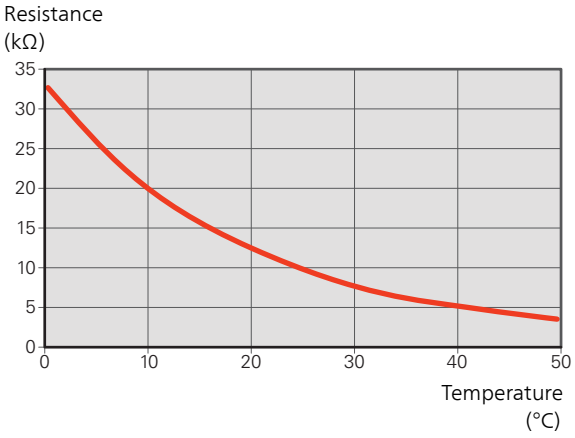
Tho-D



Tho-S, Tho-R1, Tho-R2



BT28 (Tho-A)



Data for return line temperature sensor (BT3), condensor supply (BT12) and fluid pipe (BT15)

Temperature (°C)	*Resistance (kOhm)*	*Voltage (VDC)*
-40	351.0	3.256
-35	251.6	3.240
-30	182.5	3.218
-25	133.8	3.189
-20	99.22	3.150
-15	74.32	3.105
-10	56.20	3.047
-5	42.89	2.976
0	33.02	2.889
5	25.61	2.789
10	20.02	2.673
15	15.77	2.541
20	12.51	2.399
25	10.00	2.245
30	8.045	2.083
35	6.514	1.916
40	5.306	1.752
45	4.348	1.587
50	3.583	1.426
55	2.968	1.278
60	2.467	1.136
65	2.068	1.007
70	1.739	0.891
75	1.469	0.785
80	1.246	0.691
85	1.061	0.607
90	0.908	0.533
95	0.779	0.469
100	0.672	0.414

10 Alarm list

Alarm	*Alarm text on the display*	*Description*	*May be due to*
3	Sensor fault BT3	Sensor fault, Sensor incoming water in F2040 (BT3).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board AA23 in F2040
12	Sensor fault BT12	Sensor fault, Sensor outgoing water in F2040 (BT12).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board AA23 in F2040
15	Sensor fault BT15	Sensor fault, Sensor fluid pipe in F2040 (BT15).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board AA23 in F2040
162	High condenser out	Too high temperature out from the condenser. Self-resetting.	• Low flow during heating operation • Too high set temperatures
163	High condenser in	Too high temperature into the condenser. Self-resetting.	• Temperature generated by another heat source
183	Defrosting in progress	Not an alarm, but an operating status.	• Set when the heat pump runs the defrosting procedure
220	HP alarm	The high pressure switch (63H1) deployed 5 times within 60 minutes or for 60 minutes continuously.	• Insufficient air circulation or blocked heat exchanger • Open circuit or short circuit on input for high pressure switch (63H1) • Defective high pressure switch • Expansion valve not correctly connected • Service valve closed • Defective control board in F2040 • Low or no flow during heating operation • Defective circulation pump • Defective fuse, F(4A)
221	LP alarm	Too low value on the low pressure sensor 3 times within 60 minutes.	• Open circuit or short circuit on input for low pressure sensor • Defective low pressure sensor • Defective control board in F2040 • Open circuit or short circuit on input for suction gas sensor (Tho-S) • Defective suction gas sensor (Tho-S)

Alarm	*Alarm text on the display*	*Description*	*May be due to*
223	OU Com. error	Communication between the control board and the communication board is interrupted. There must be 22 volt direct current (DC) at the switch CNW2 on the control board (PWB1).	• Any circuit breakers for F2040 off • Incorrect cable routing
224	Fan alarm	Deviations in the fan speed in F2040.	• The fan cannot rotate freely • Defective control board in F2040 • Defective fan motor • Control board in F2040 dirty • Fuse (F2) blown
230	Continuously high hot gas	Temperature deviation on the hot gas sensor (Tho-D) twice within 60 minutes or for 60 minutes continuously.	• Sensor does not work (see section "Ambient temperature sensor") • Insufficient air circulation or heat exchanger • Blocked • If the fault persists during cooling, there may be an insufficient amount of refrigerant. • Defective control board in F2040
254	Communication error	Communication fault with accessory board	• F2040 not powered • Fault in the communication cable.
261	High temperature in heat exchanger	Temperature deviation on the heat exchanger sensor (Tho-R1/R2) five times within 60 minutes or for 60 minutes continuously.	• Sensor does not work (see section "Disturbances in comfort") • Insufficient air circulation or blocked heat exchanger • Defective control board in F2040 • Too much refrigerant
262	Power transistor too hot	When IPM (Intelligent power module) displays FO-signal (Fault Output) five times during a 60-minute period.	• Can occur when 15V power supply to the inverter PCB is unstable.
263	Inverter error	Voltage from the inverter outside the parameters four times within 30 minutes.	• Incoming power supply interference • Service valve closed • Insufficient amount of refrigerant • Compressor fault • Defective circuit board for inverter in F2040
264	Inverter error	Communication between circuit board for inverter and control board broken.	• Open circuit in connection between boards • Defective circuit board for inverter in F2040 • Defective control board in F2040
265	Inverter error	Continuous deviation on power transistor for 15 minutes.	• Defective fan motor • Defective circuit board for inverter in F2040
266	Insufficient refrigerant	Insufficient refrigerant is detected upon start-up in cooling mode.	• Service valve closed • Loose connection sensor (BT15, BT3) • Defective sensor (BT15, BT3) • Too little refrigerant
267	Inverter error	Failed start for compressor	• Defective circuit board for inverter in F2040 • Defective control board in F2040 • Compressor fault
268	Inverter error	Overcurrent, Inverter A/F module	• Sudden power failure

Alarm	*Alarm text on the display*	*Description*	*May be due to*
271	Cold outdoor air	Temperature of BT28 below the value that permits operation	• Cold weather conditions • Sensor fault
272	Hot outdoor air	Temperature of BT28 above the value that permits operation	• Warm weather conditions • Sensor fault
277	Sensor fault Tho-R	Sensor fault, heat exchanger in F2040(Tho-R).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board in F2040
278	Sensor fault Tho-A	Sensor fault, outdoor temperature sensor in F2040 (Tho-A).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board in F2040
279	Sensor fault Tho-D	Sensor fault, hot gas in F2040 (Tho-D).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board in F2040
280	Sensor fault Tho-S	Sensor fault, suction gas in F2040 (Tho-S).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board in F2040
281	Sensor fault LPT	Sensor fault, low pressure transmitter in F2040.	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board in F2040 • Fault in the refrigerant circuit
294	Non-compatible air/water heat pump	Heat pump and indoor module do not work properly together due to technical parameters.	• Outdoor module and indoor module are not compatible.
404	Sensor fault BP4	Sensor fault, Sensor high pressure heating/low pressure cooling in F2040 (BP4).	Open circuit or short circuit on sensor input Sensor does not work (see section "Disturbances in comfort") Defective control board AA23 in F2040

11 Accessories

ACCESSORY CARD AXC 30

An accessory board for active cooling (4-pipe system), extra climate system, hot water comfort or if more than four charge pumps are to be connected to F2040. It can also be used for step controlled additional heat (e.g. external electric boiler), shunt controlled additional heat (e.g. wood/oil/gas/pellet boiler).

An accessory board is required if for example an HWC pump is to be connected to F2040 at the same time that the common alarm indication is activated.

Part no. 067 304

CHARGE PUMP CPD 11

Charge pump for heat pump

CPD 11-25/65

Part no. 067 321

CPD 11-25/75

Part no. 067 320

CONDENSATION WATER PIPE

Condensation water pipe, different lengths.

Earth circuit breaker 1-phase.

KVR 10-10 F2040 / HBS05

1 metres

Part no. 067 614

KVR 10-30 F2040 / HBS05

3 metres

Part no. 067 616

KVR 10-60 F2040 / HBS05

6 metres

Part no. 067 618

HOT WATER CONTROL

VST 05

Reversing valve, Cu pipe Ø22 mm

Max. heat pump size 8 kW

Part no. 089 982

VST 11

Reversing valve, Cu pipe Ø28 mm

Max. recommended power, 17 kW

Part no. 089 152

STAND AND BRACKETS

Ground stand

F2040-6, -8, -12, -16

Part no. 067 599

Wall bracket

F2040-6, -8, -12

Part no. 067 598

WATER HEATER/ACCUMULATOR TANK

HA-WH5

Megacoil, 160 litre
Art. no G1110001

Megacoil, 200 litre
Art. no G1110002

Megacoil, 300 litre
Art. no G1110003

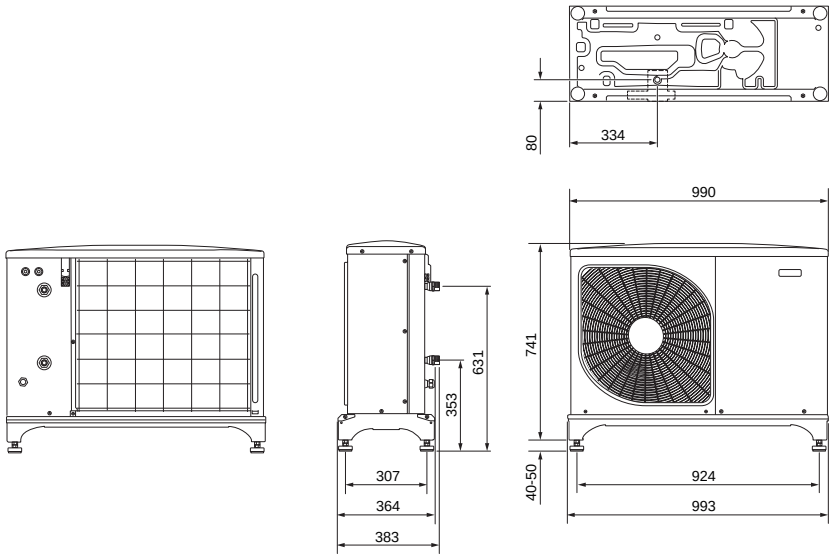
Megacoil, Solar 200 litre
Art. no G1110004

Megacoil, Solar 300 litre
Art. no G1110005

12 Technical data

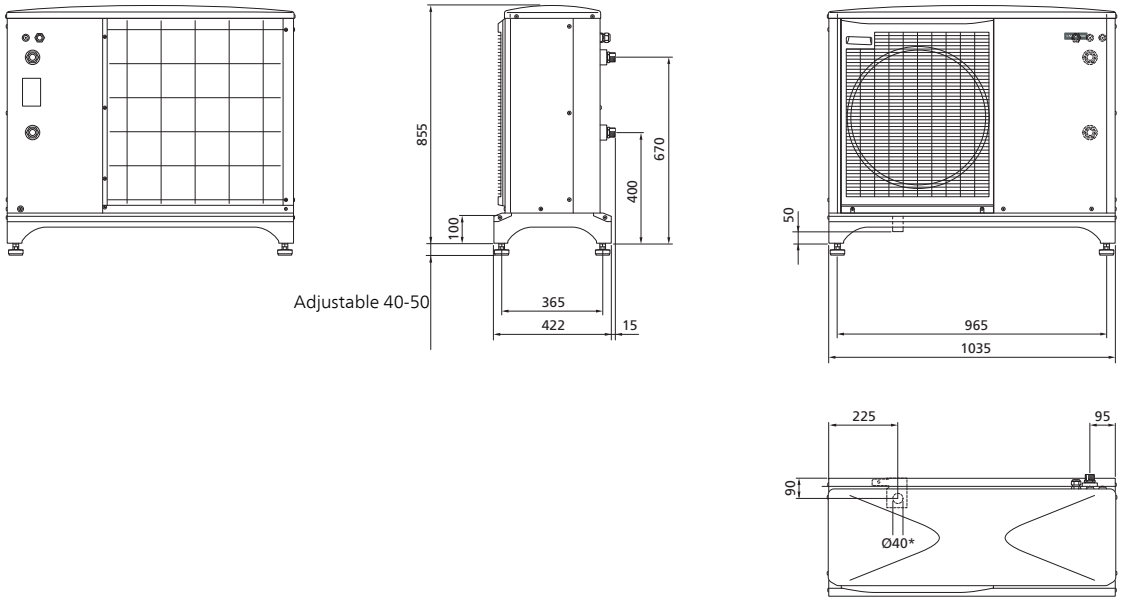
Dimensions and setting-out coordinates

F2040-6



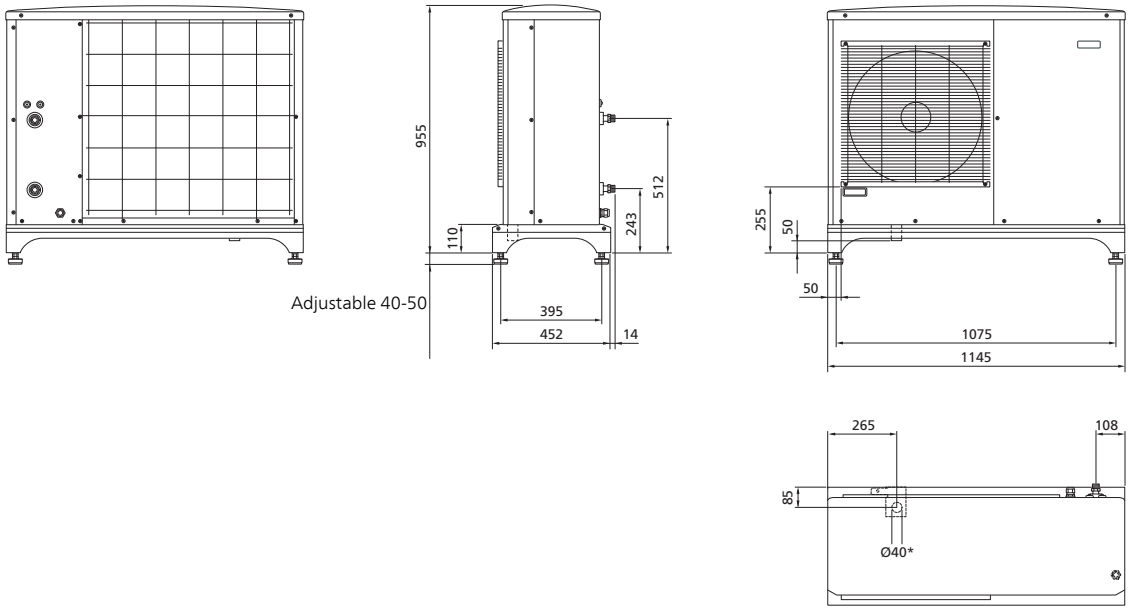
* Accessory KVR 10 is required.

F2040-8



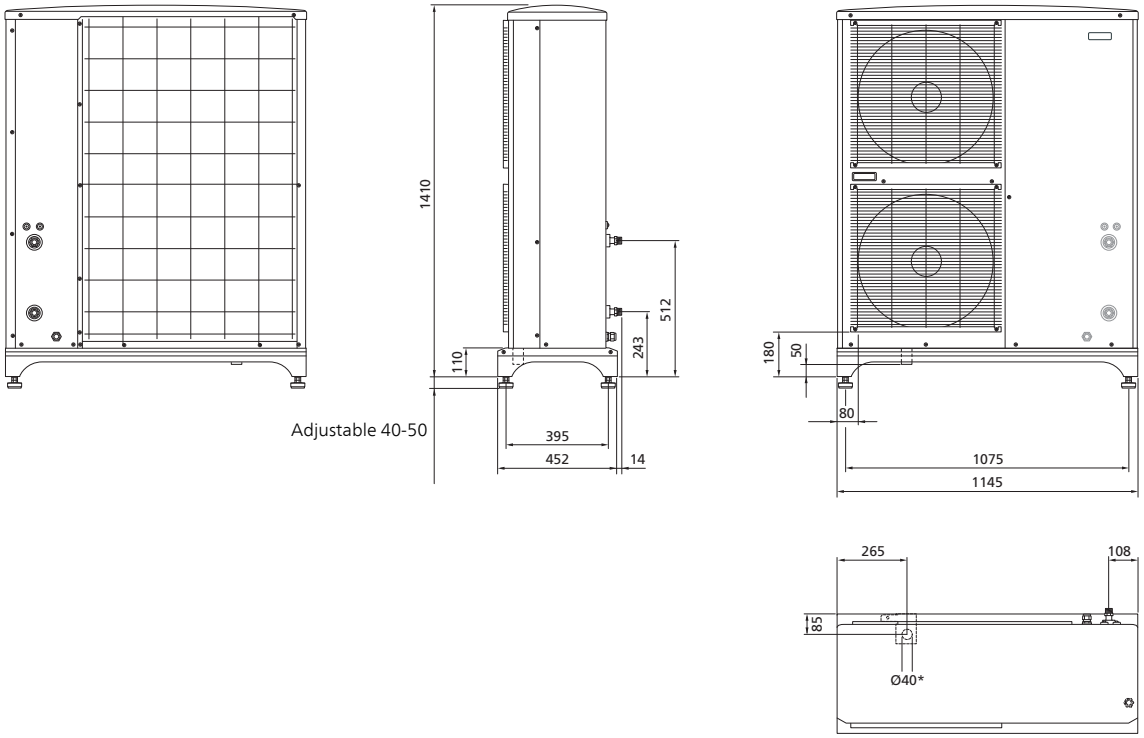
* Accessory KVR 10 is required.

F2040-12

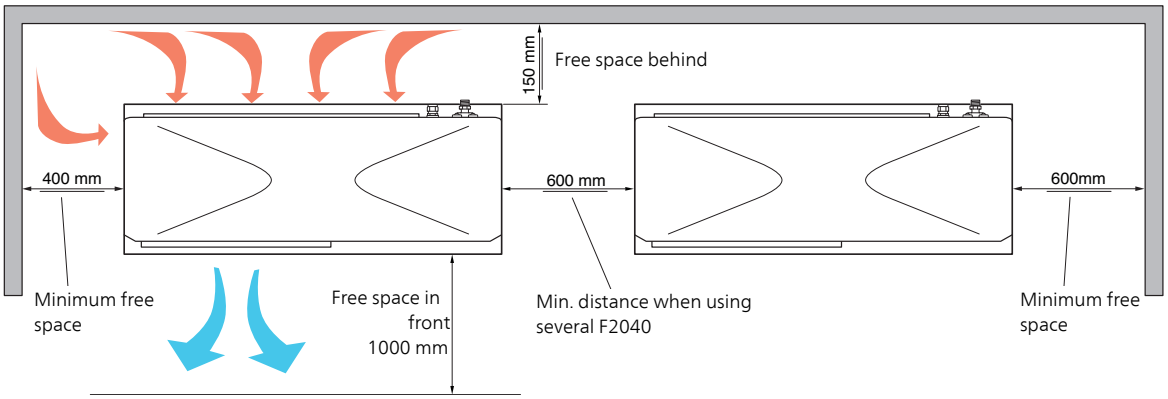


* Accessory KVR 10 is required.

F2040-16



* Accessory KVR 10 is required.

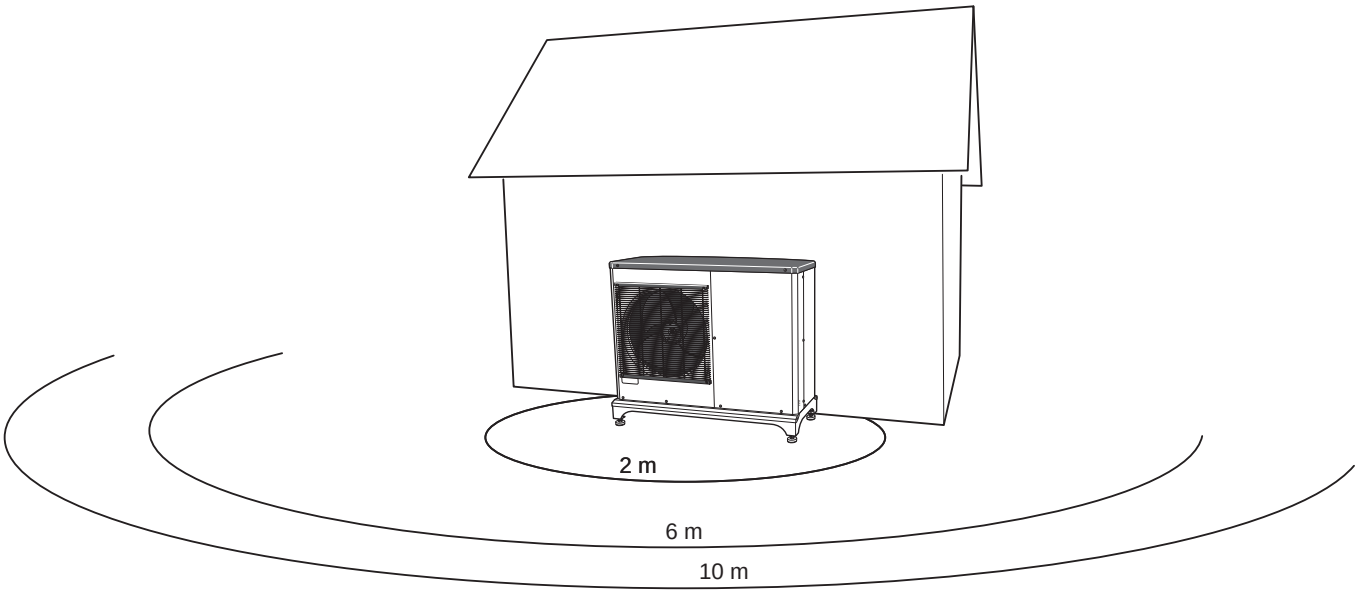


Sound pressure levels

F2040 is usually placed next to a house wall, which gives a directed sound distribution that should be considered. Accordingly, you should always attempt when positioning to choose the side that faces the least sound sensitive neighbouring area.

The sound pressure levels are further affected by walls, bricks, differences in ground level, etc and should therefore only be seen as guide values.

F2040 adjusts the fan speed depending on the ambient temperature and evaporation temperature.



Air/water heat pump		*F2040-6*	*F2040-8*	*F2040-12*	*F2040-16*
Sound power level* According to EN12102 at 7/45 (nominal)	L_W(A)	50	55	58	61
Sound pressure level at 2 m free standing.*	dB(A)	36	40	43	47
Sound pressure level at 6 m free standing.*	dB(A)	26.5	30.5	33.5	37.5
Sound pressure level at 10 m free standing.*	dB(A)	22	26	29	33

* Free space.

Technical specifications

CE IP 21

Air/water heat pump		*F2040-6*	*F2040-8*	*F2040-12*	*F2040-16*
Output data according to EN 14511 ΔT5K	Outdoor temp./ Supply temp.				
Heating	7/35 °C (floor)	2.67/0.50/5.32	3.86/0.83/4.65	5.21/1.09/4.78	7.03/1.45/4.85
Capacity / power input / COP (kW/kW/-) at nominal flow	2/35 °C (floor)	2.32/0.55/4.20	5.11/1.36/3.76	6.91/1.79/3.86	9.33/2.38/3.92
	-7/35 °C (floor)	4.60/1.79/2.57	6.60/2.46/2.68	9.00/3.27/2.75	12.1/4.32/2.80
	7/45 °C	2.28/0.63/3.62	3.70/1.00/3.70	5.00/1.31/3.82	6.75/1.74/3.88
	2/45 °C	1.93/0.67/2.88	5.03/1.70/2.96	6.80/2.24/3.04	9.18/2.98/3.08
Cooling	27/7 °C	5.87/1.65/3.56	7.52/2.37/3.17	9.87/3.16/3.13	13.30/3.99/3.33
Capacity / Power input / EER (kW/kW/-) at maximum flow	27/18 °C	7.98/1.77/4.52	11.20/3.20/3.50	11.70/3.32/3.52	17.70/4.52/3.91
	35/7 °C	4.86/1.86/2.61	7.10/2.65/2.68	9.45/3.41/2.77	13.04/4.53/2.88
	35/18 °C	7.03/2.03/3.45	9.19/2.98/3.08	11.20/3.58/3.12	15.70/5.04/3.12
Electrical data					
Rated voltage		230V ~ 50Hz, 230V 2 ~ 50Hz			
Max operating current, heat pump	A_{rms}	15	16	23	25
Max operating current, compressor	A_{rms}	14	15	22	24
Starting current	A_{rms}	5			
Nominal output, fan	W	50	86	86	2 x 86
Fuse[1)]	A_{rms}	16	16	25	25
Enclosure class		IP24			
Refrigerant circuit					
Type of refrigerant		R410A			
GWP refrigerant		2,088			
Type of compressor		Twin Rotary			
Compressor oil		M-MA68			
Volume	kg	1.5	2.55	2.9	4.0
CO_2 equivalent	t	3.13	5.32	6.06	8.35
Cut-out value pressostat HP	MPa	-	4.15 (41.5 bar)		
Cut-out value HP		4.15 (41.5 bar)	-		
Cut-out value pressostat LP	MPa	-	0.079 (0.79 bar)		
Brine					
Airflow	m^3/h	2,530	3,000	4,380	6,000
Min. / Max. air temp.	°C	-20 / 43			
Defrosting system		Reverse cycle			
Heating medium circuit					
Min/Max system pressure heating medium	MPa	0.05/0.25 (0.5/4.5bar)			
Min volume, climate system, heating/cooling	l	20	50	80	150
Min volume, climate system, under floor cooling	l	50	80	100	150
Max flow, climate system	l/s	0.29	0.38	0.57	0.79
Min flow, climate system, at 100% circulation pump speed (defrosting flow)	l/s	0.19	0.19	0.29	0.39
Min flow, heating	l/s	0.09	0.12	0.15	0.25
Min flow, cooling	l/s	0.11	0.15	0.20	0.32
Min. / Max. HM temp continuous operation	°C	25 / 58			
Connection heating medium ext thread		G1"			
Dimensions and weight					
Width	mm	993	1035	1145	1145
Depth	mm	364	422	452	452
Height with stand	mm	791 (+50/-0)	895 (+50/-0)	995 (+50/-0)	1450 (+50/-0)
Weight (excl. packaging)	kg	66	90	105	135
Miscellaneous					
Part No.		064 206	064 109	064 092	064 108

[1)]Specified output is limited with lower fusing.

SCOP & $P_{DESIGNH}$

SCOP & $P_{designh}$ F2040 according to EN 14825								
F2040	6		8		12		16	
	$P_{designh}$	SCOP	$P_{designh}$	SCOP	$P_{designh}$	SCOP	$P_{designh}$	SCOP
SCOP 35 Average climate	4.8	4.8	6.8	3.88	12	4.43	14,5	4.48
SCOP 55 Average climate	5,3	3.46	7.0	3.22	10	3,37	14	3.43
SCOP 35 Cold climate	4,0	3,65	9	3.55	11.5	3.63	15	3.68
SCOP 55 Cold climate	5,6	2.97	10	2.78	13	2.85	16	2,9
SCOP 35 Warm climate	4,2	6.45	8	5,7	12	5.8	15	5.95
SCOP 55 Warm climate	4.76	4.58	8	4.58	12	4.7	15	4.8

ENERGY RATING, AVERAGE CLIMATE

Model		*F2040-6*	*F2040-8*	*F2040-12*	*F2040-16*
Control module model		*SMO*	*SMO*	*SMO*	*SMO*
Temperature application	*°C*	*35 / 55*	*35 / 55*	*35 / 55*	*35 / 55*
The product's room heating efficiency class[1)]		A++ / A++	A++ / A++	A++ / A++	A++ / A++
Space heating efficiency class of the system[2)]		A+++ / A++	A+++ / A++	A+++ / A++	A+++ / A++

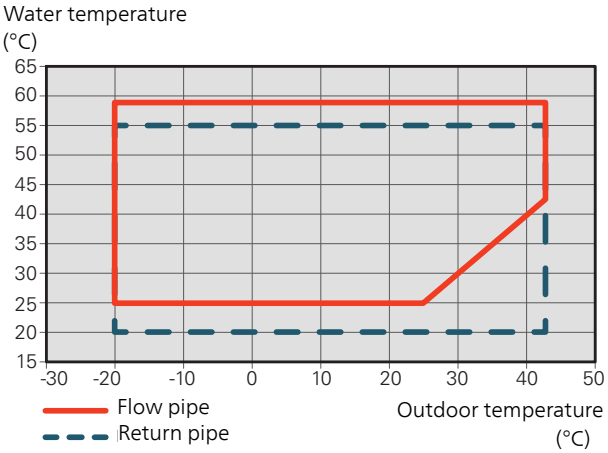
[1]Scale for the product's room heating efficiency class A++ to G.

[2]Scale for the system's room heating efficiency class A+++ to G.

The reported efficiency of the package also takes the controller into account. If an external supplementary boiler or solar heating is added to the package, the overall efficiency of the package should be recalculated.

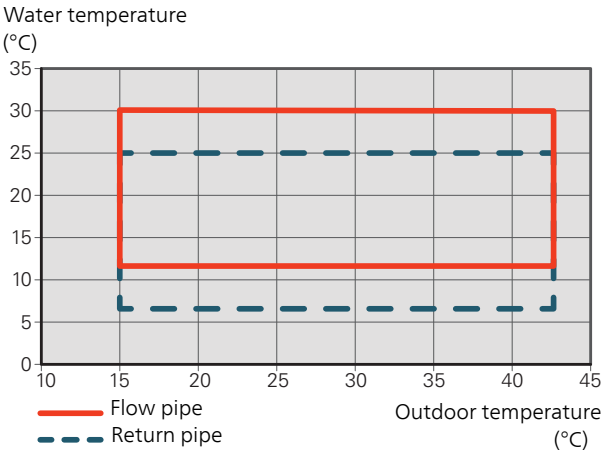
Working area

Compressor operation – heating



During shorter time it is allowed to have lower working temperatures on the water side, e.g. during start up.

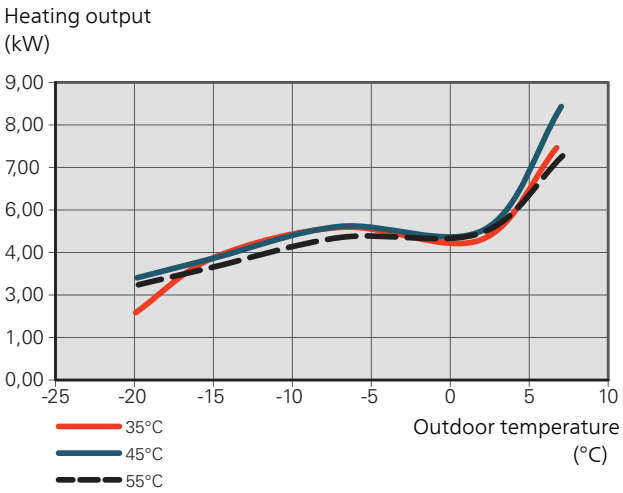
Compressor operation – cooling



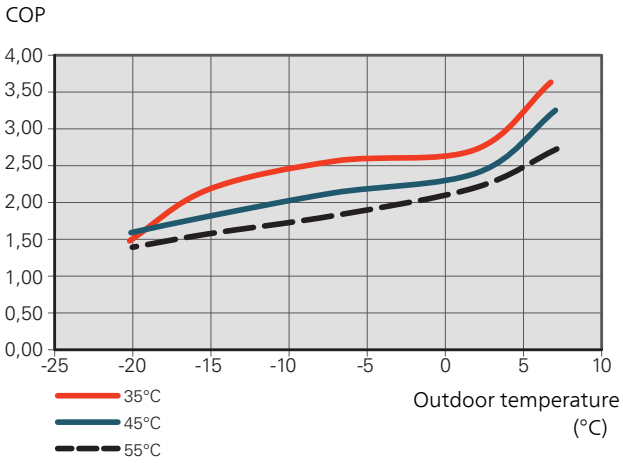
Capacity and COP

Capacity and COP at different supply temperatures. Maximum capacity including defrosting.

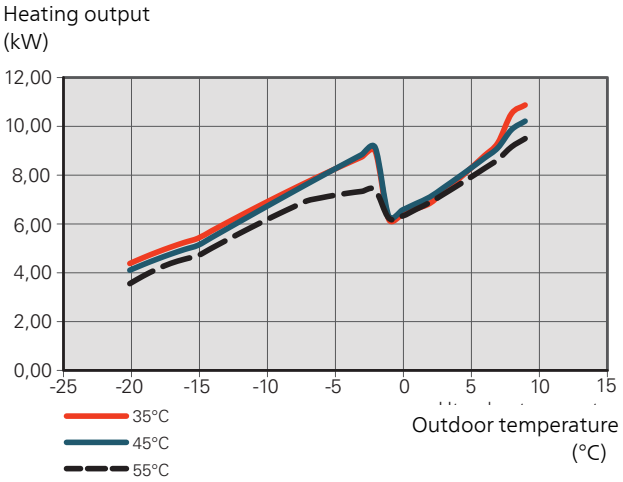
Max. capacity F2040-6



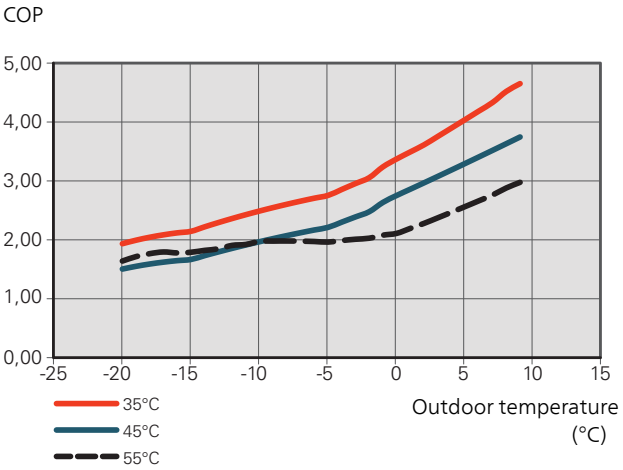
COP F2040-6



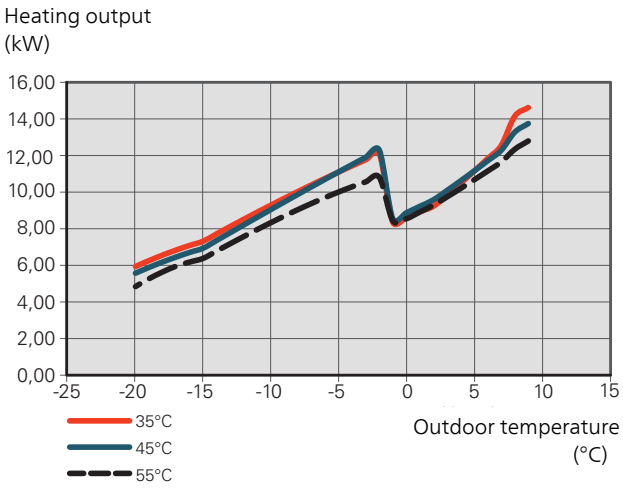
Max specified output F2040-8



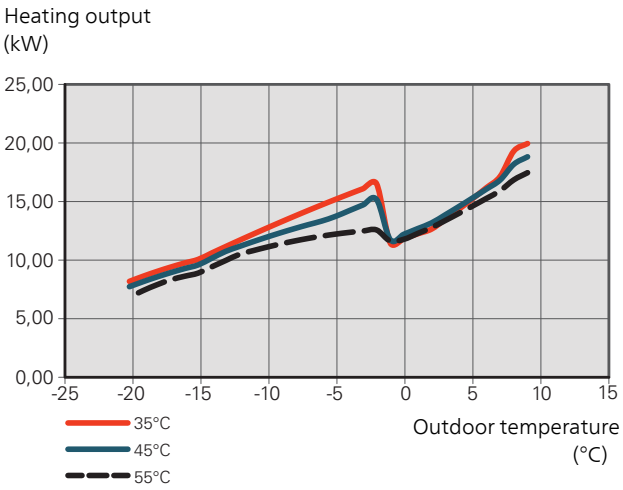
COP F2040-8



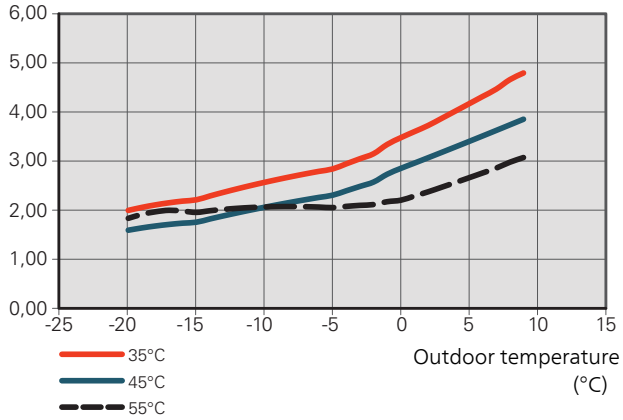
Max specified output F2040-12



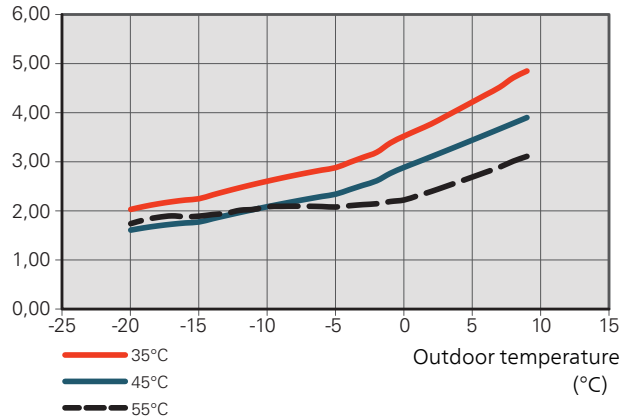
Max specified output F2040-16



COP F2040-12

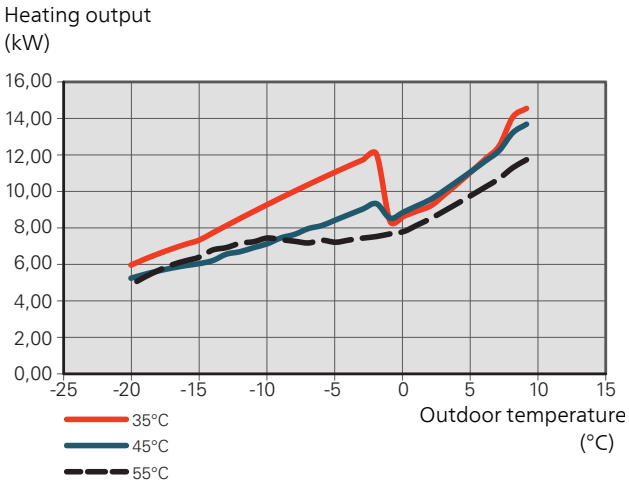


COP F2040-16

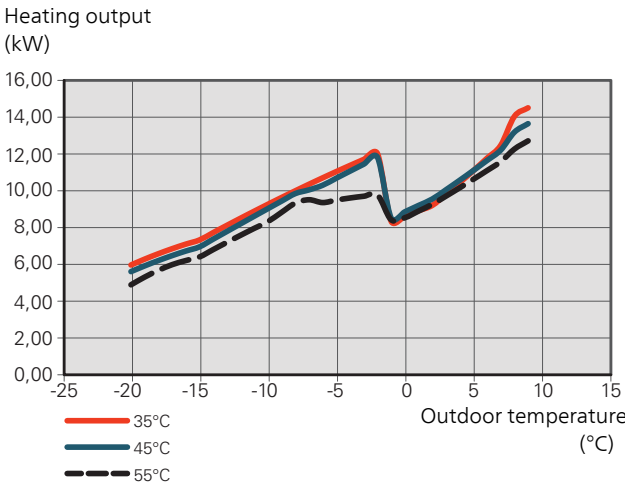


Output with lower fuse rating than recommended

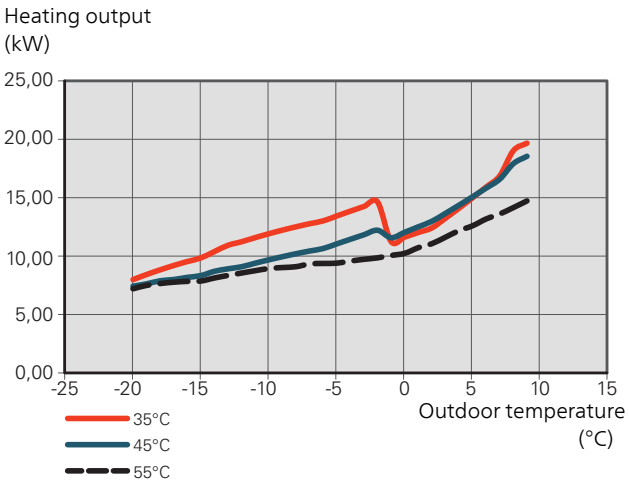
Supplied power F2040-12 , fuse rating 16A



Supplied power F2040-12 , fuse rating 20A



Supplied power F2040-16 , fuse rating 20A



Energy labelling

INFORMATION SHEET

Supplier		*NIBE*			
Model		*F2040-6*	*F2040-8*	*F2040-12*	*F2040-16*
Temperature application	*°C*	*35 / 55*	*35 / 55*	*35 / 55*	*35 / 55*
Seasonal space heating energy efficiency class, average climate		A++ / A++	A++ / A++	A++ / A++	A++ / A++
Rated heat output ($P_{designh}$), average climate	kW	5 / 5	7 / 7	12 / 10	15 / 14
Annual energy consumption space heating, average climate	kWh	2,089 / 3,248	3,622 / 4,486	5,361 / 6,137	6,702 / 8,431
Seasonal space heating energy efficiency, average climate	%	188 / 131	152 / 126	174 / 132	176 / 134
Sound power level L_{WA} indoors	dB	35	35	35	35
Rated heat output ($P_{designh}$), cold climate	kW	4 / 6	9 / 10	12 / 13	15 / 16
Rated heat output ($P_{designh}$), warm climate	kW	4 / 5	8 / 8	12 / 12	15 / 15
Annual energy consumption space heating, cold climate	kWh	2,694 / 4,610	6,292 / 9,016	7,920 / 11,461	10,040 / 13,629
Annual energy consumption space heating, warm climate	kWh	872 / 1,398	1,879 / 2,371	2,765 / 3,445	3,370 / 4,183
Seasonal space heating energy efficiency, cold climate	%	143 / 116	138 / 106	140 / 109	144 / 113
Seasonal space heating energy efficiency, warm climate	%	252 / 179	224 / 177	229 / 183	235 / 189
Sound power level L_{WA} outdoors	dB	50	55	58	61

DATA FOR ENERGY EFFICIENCY OF THE PACKAGE

Model		*F2040-6*	*F2040-8*	*F2040-12*	*F2040-16*
Control module model		*SMO*	*SMO*	*SMO*	*SMO*
Temperature application	*°C*	*35 / 55*	*35 / 55*	*35 / 55*	*35 / 55*
Controller, class		VI			
Controller, contribution to efficiency	%	4.0			
Seasonal space heating energy efficiency of the package, average climate	%	192 / 135	156 / 130	178 / 136	180 / 138
Seasonal space heating energy efficiency class of the package, average climate		A+++ / A++	A+++ / A++	A++ / A++	A+++ / A++
Seasonal space heating energy efficiency of the package, cold climate	%	147 / 120	142 / 110	144 / 113	148 / 117
Seasonal space heating energy efficiency of the package, warm climate	%	256 / 183	228 / 181	233 / 187	239 / 193

The reported efficiency of the package also takes the controller into account. If an external supplementary boiler or solar heating is added to the package, the overall efficiency of the package should be recalculated.

TECHNICAL DOCUMENTATION

Model		*F2040-6*					
Type of heat pump		☒ Air-water ☐ Exhaust-water ☐ Brine-water ☐ Water-water					
Low-temperature heat pump		☐ Yes ☒ No					
Integrated immersion heater for additional heat		☐ Yes ☒ No					
Heat pump combination heater		☐ Yes ☒ No					
Climate		☒ Average ☐ Cold ☐ Warm					
Temperature application		☒ Average (55 °C) ☐ Low (35 °C)					
Applied standards		EN14825 / EN14511 / EN12102					
Rated heat output	Prated	5.3	kW	*Seasonal space heating energy efficiency*	η_s	131	%
Declared capacity for space heating at part load and at outdoor temperature Tj				*Declared coefficient of performance for space heating at part load and at outdoor temperature Tj*			
Tj = -7 °C	Pdh	4.7	kW	Tj = -7 °C	COPd	1.88	-
Tj = +2 °C	Pdh	2.8	kW	Tj = +2 °C	COPd	3.26	-
Tj = +7 °C	Pdh	1.8	kW	Tj = +7 °C	COPd	4.72	-
Tj = +12 °C	Pdh	2.7	kW	Tj = +12 °C	COPd	6.47	-
Tj = biv	Pdh	4.7	kW	Tj = biv	COPd	1.88	-
Tj = TOL	Pdh	4.1	kW	Tj = TOL	COPd	1.77	-
Tj = -15 °C (if TOL < -20 °C)	Pdh		kW	Tj = -15 °C (if TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-7	°C	Min. outdoor air temperature	TOL	-10	°C
Cycling interval capacity	Pcych		kW	Cycling interval efficiency	COPcyc		-
Degradation coefficient	Cdh	0.99	-	Max supply temperature	WTOL	58	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.007	kW	Rated heat output	Psup	1.2	kW
Thermostat-off mode	P_{TO}	0.012	kW				
Standby mode	P_{SB}	0.012	kW	Type of energy input	Electric		
Crankcase heater mode	P_{CK}	0	kW				
Other items							
Capacity control	Variable			Rated airflow (air-water)		2,526	m^3/h
Sound power level, indoors/outdoors	L_{WA}	35 / 50	dB	Nominal heating medium flow			m^3/h
Annual energy consumption	Q_{HE}	3,248	kWh	Brine flow brine-water or water-water heat pumps			m^3/h
Contact information	*NIBE Energy Systems – Box 14 – Hannabadsvägen 5 – 285 21 Markaryd – Sweden*						

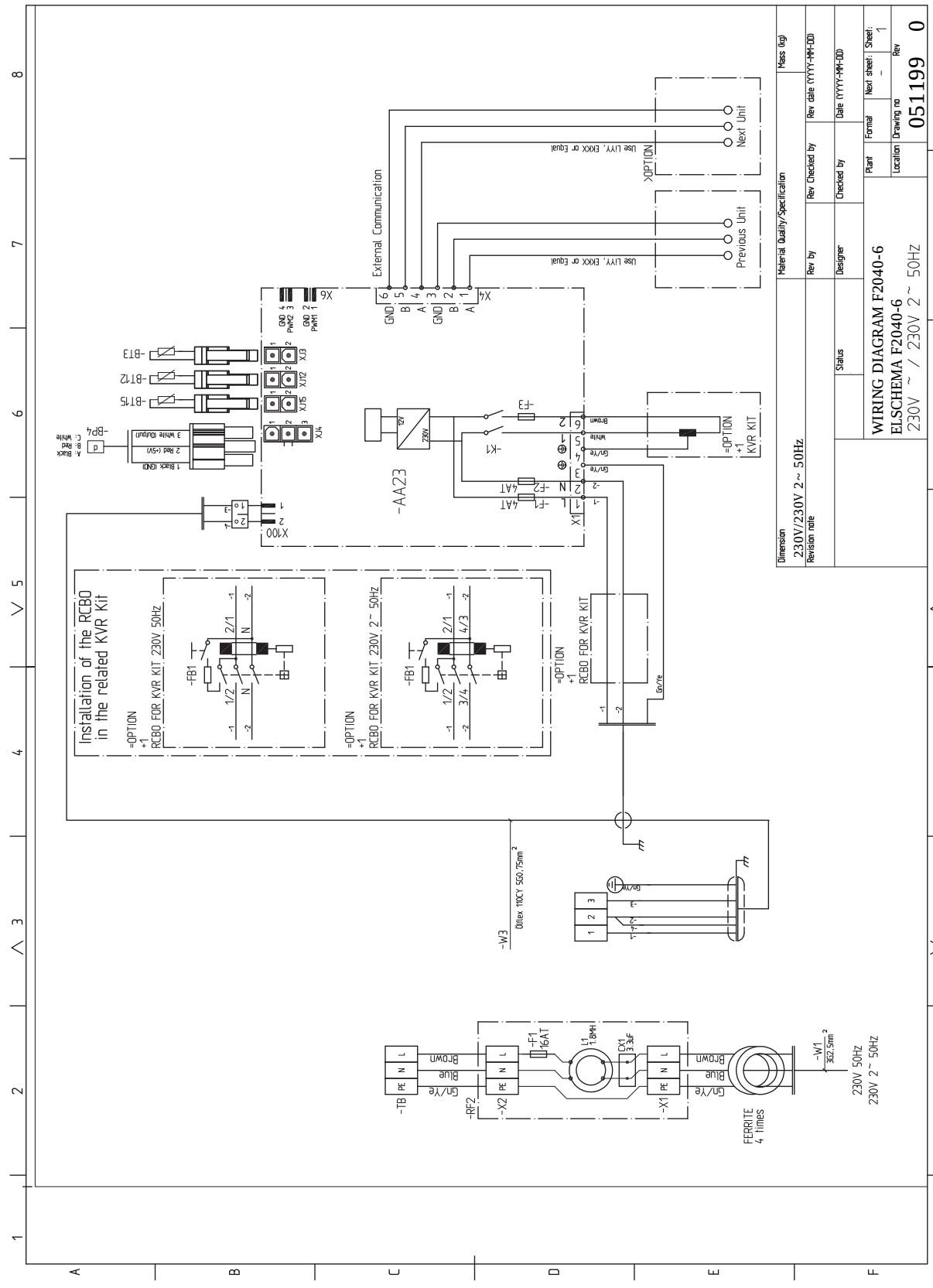
Model		*F2040-8*					
Type of heat pump		☒ Air-water ☐ Exhaust-water ☐ Brine-water ☐ Water-water					
Low-temperature heat pump		☐ Yes ☒ No					
Integrated immersion heater for additional heat		☐ Yes ☒ No					
Heat pump combination heater		☐ Yes ☒ No					
Climate		☒ Average ☐ Cold ☐ Warm					
Temperature application		☒ Average (55 °C) ☐ Low (35 °C)					
Applied standards		EN14511 / EN14825 / EN12102					
Rated heat output	Prated	7	kW	*Seasonal space heating energy efficiency*	η_s	127	%
Declared capacity for space heating at part load and at outdoor temperature Tj				*Declared coefficient of performance for space heating at part load and at outdoor temperature Tj*			
Tj = -7 °C	Pdh	5.7	kW	Tj = -7 °C	COPd	2.01	-
Tj = +2 °C	Pdh	3.9	kW	Tj = +2 °C	COPd	3.20	-
Tj = +7 °C	Pdh	2.6	kW	Tj = +7 °C	COPd	4.21	-
Tj = +12 °C	Pdh	2.0	kW	Tj = +12 °C	COPd	5.18	-
Tj = biv	Pdh	5.7	kW	Tj = biv	COPd	2.01	-
Tj = TOL	Pdh	5.7	kW	Tj = TOL	COPd	1.78	-
Tj = -15 °C (if TOL < -20 °C)	Pdh		kW	Tj = -15 °C (if TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-7	°C	Min. outdoor air temperature	TOL	-10	°C
Cycling interval capacity	Pcych		kW	Cycling interval efficiency	COPcyc		-
Degradation coefficient	Cdh	0.97	-	Max supply temperature	WTOL	58	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.045	kW	Rated heat output	Psup	1.5	kW
Thermostat-off mode	P_{TO}	0.048	kW				
Standby mode	P_{SB}	0.045	kW	Type of energy input	Electric		
Crankcase heater mode	P_{CK}	0.045	kW				
Other items							
Capacity control	Variable			Rated airflow (air-water)		3,000	m^3/h
Sound power level, indoors/outdoors	L_{WA}	35 / 55	dB	Nominal heating medium flow		0.6	m^3/h
Annual energy consumption	Q_{HE}	4,486	kWh	Brine flow brine-water or water-water heat pumps			m^3/h
Contact information	*NIBE Energy Systems – Box 14 – Hannabadsvägen 5 – 285 21 Markaryd – Sweden*						

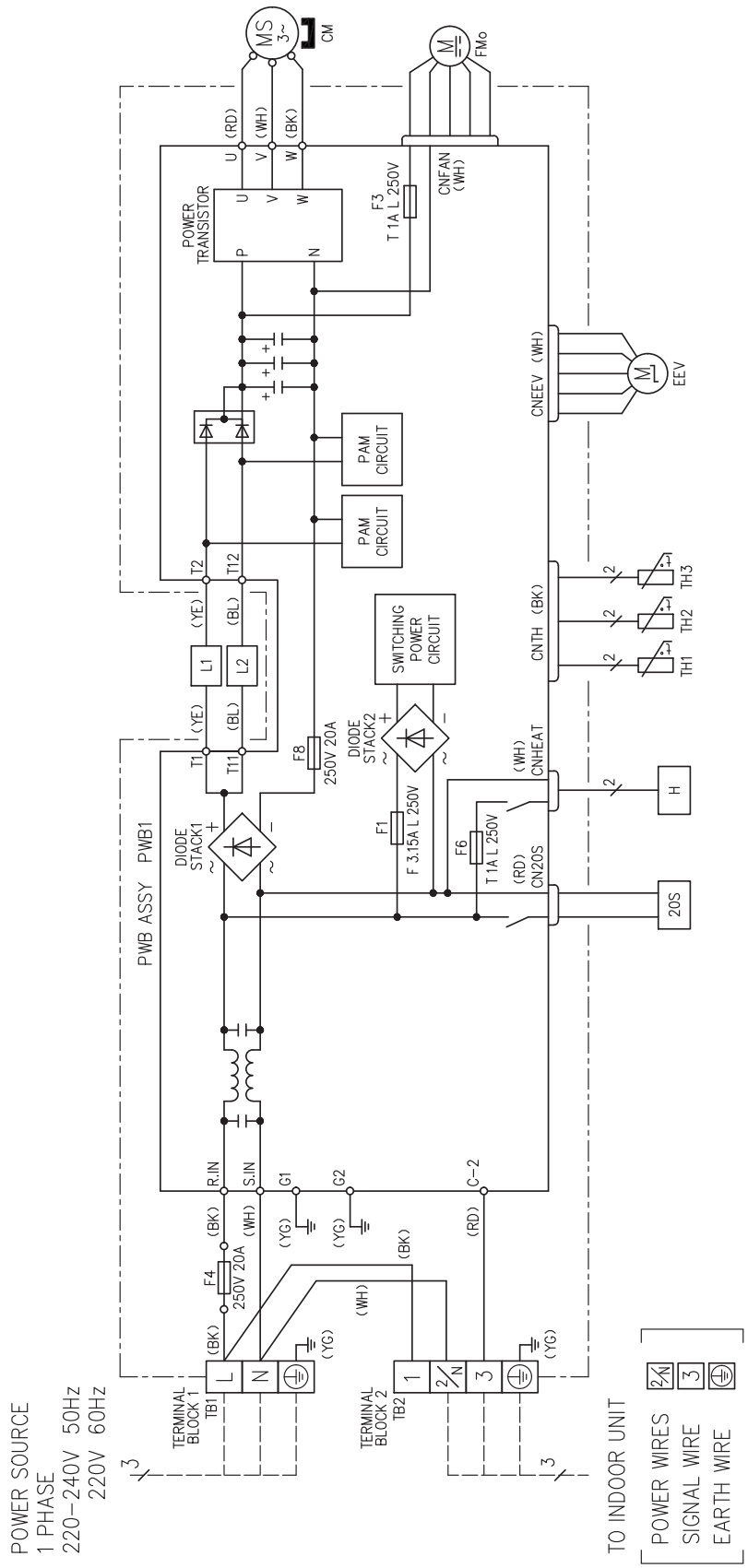
Model		*F2040-12*					
Type of heat pump		☒ Air-water ☐ Exhaust-water ☐ Brine-water ☐ Water-water					
Low-temperature heat pump		☐ Yes ☒ No					
Integrated immersion heater for additional heat		☐ Yes ☒ No					
Heat pump combination heater		☐ Yes ☒ No					
Climate		☒ Average ☐ Cold ☐ Warm					
Temperature application		☒ Average (55 °C) ☐ Low (35 °C)					
Applied standards		EN14825 / EN14511 / EN12102					
Rated heat output	Prated	10	kW	*Seasonal space heating energy efficiency*	η_s	132	%
Declared capacity for space heating at part load and at outdoor temperature Tj				*Declared coefficient of performance for space heating at part load and at outdoor temperature Tj*			
Tj = -7 °C	Pdh	8.9	kW	Tj = -7 °C	COPd	1.99	-
Tj = +2 °C	Pdh	5.5	kW	Tj = +2 °C	COPd	3.22	-
Tj = +7 °C	Pdh	3.5	kW	Tj = +7 °C	COPd	4.61	-
Tj = +12 °C	Pdh	5.0	kW	Tj = +12 °C	COPd	6.91	-
Tj = biv	Pdh	9.2	kW	Tj = biv	COPd	1.90	-
Tj = TOL	Pdh	8.1	kW	Tj = TOL	COPd	1.92	-
Tj = -15 °C (if TOL < -20 °C)	Pdh		kW	Tj = -15 °C (if TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-8	°C	Min. outdoor air temperature	TOL	-10	°C
Cycling interval capacity	Pcych		kW	Cycling interval efficiency	COPcyc		-
Degradation coefficient	Cdh	0.98	-	Max supply temperature	WTOL	58	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.002	kW	Rated heat output	Psup	1.9	kW
Thermostat-off mode	P_{TO}	0.014	kW				
Standby mode	P_{SB}	0.015	kW	Type of energy input	Electric		
Crankcase heater mode	P_{CK}	0.035	kW				
Other items							
Capacity control	Variable			Rated airflow (air-water)		4,380	m^3/h
Sound power level, indoors/outdoors	L_{WA}	35 / 58	dB	Nominal heating medium flow		0.86	m^3/h
Annual energy consumption	Q_{HE}	6,137	kWh	Brine flow brine-water or water-water heat pumps			m^3/h
Contact information	*NIBE Energy Systems – Box 14 – Hannabadsvägen 5 – 285 21 Markaryd – Sweden*						

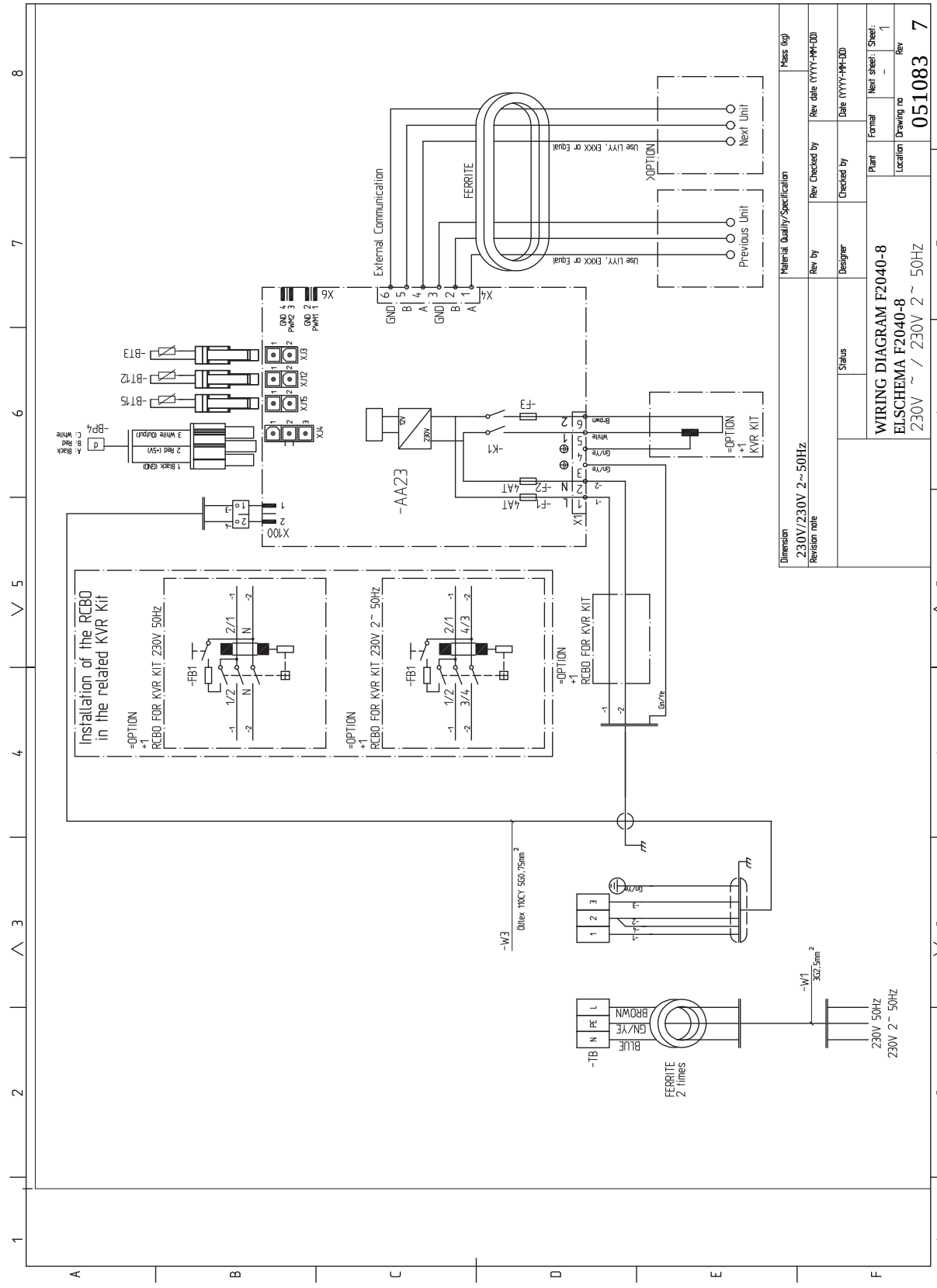
Model		*F2040-16*					
Type of heat pump		☒ Air-water ☐ Exhaust-water ☐ Brine-water ☐ Water-water					
Low-temperature heat pump		☐ Yes ☒ No					
Integrated immersion heater for additional heat		☐ Yes ☒ No					
Heat pump combination heater		☐ Yes ☒ No					
Climate		☒ Average ☐ Cold ☐ Warm					
Temperature application		☒ Average (55 °C) ☐ Low (35 °C)					
Applied standards		EN14825 / EN14511 / EN12102					
Rated heat output	Prated	14	kW	*Seasonal space heating energy efficiency*	η_s	134	%
Declared capacity for space heating at part load and at outdoor temperature Tj				*Declared coefficient of performance for space heating at part load and at outdoor temperature Tj*			
Tj = -7 °C	Pdh	12.5	kW	Tj = -7 °C	COPd	2.01	-
Tj = +2 °C	Pdh	7.6	kW	Tj = +2 °C	COPd	3.29	-
Tj = +7 °C	Pdh	4.9	kW	Tj = +7 °C	COPd	4.68	-
Tj = +12 °C	Pdh	6.8	kW	Tj = +12 °C	COPd	6.51	-
Tj = biv	Pdh	12.7	kW	Tj = biv	COPd	1.95	-
Tj = TOL	Pdh	11.0	kW	Tj = TOL	COPd	1.95	-
Tj = -15 °C (if TOL < -20 °C)	Pdh		kW	Tj = -15 °C (if TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-8	°C	Min. outdoor air temperature	TOL	-10	°C
Cycling interval capacity	Pcych		kW	Cycling interval efficiency	COPcyc		-
Degradation coefficient	Cdh	0.98	-	Max supply temperature	WTOL	58	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.002	kW	Rated heat output	Psup	3.0	kW
Thermostat-off mode	P_{TO}	0.016	kW				
Standby mode	P_{SB}	0.015	kW	Type of energy input	Electric		
Crankcase heater mode	P_{CK}	0.035	kW				
Other items							
Capacity control	Variable			Rated airflow (air-water)		6,000	m^3/h
Sound power level, indoors/outdoors	L_{WA}	35 / 61	dB	Nominal heating medium flow		1.21	m^3/h
Annual energy consumption	Q_{HE}	8,431	kWh	Brine flow brine-water or water-water heat pumps			m^3/h
Contact information	*NIBE Energy Systems – Box 14 – Hannabadsvägen 5 – 285 21 Markaryd – Sweden*						

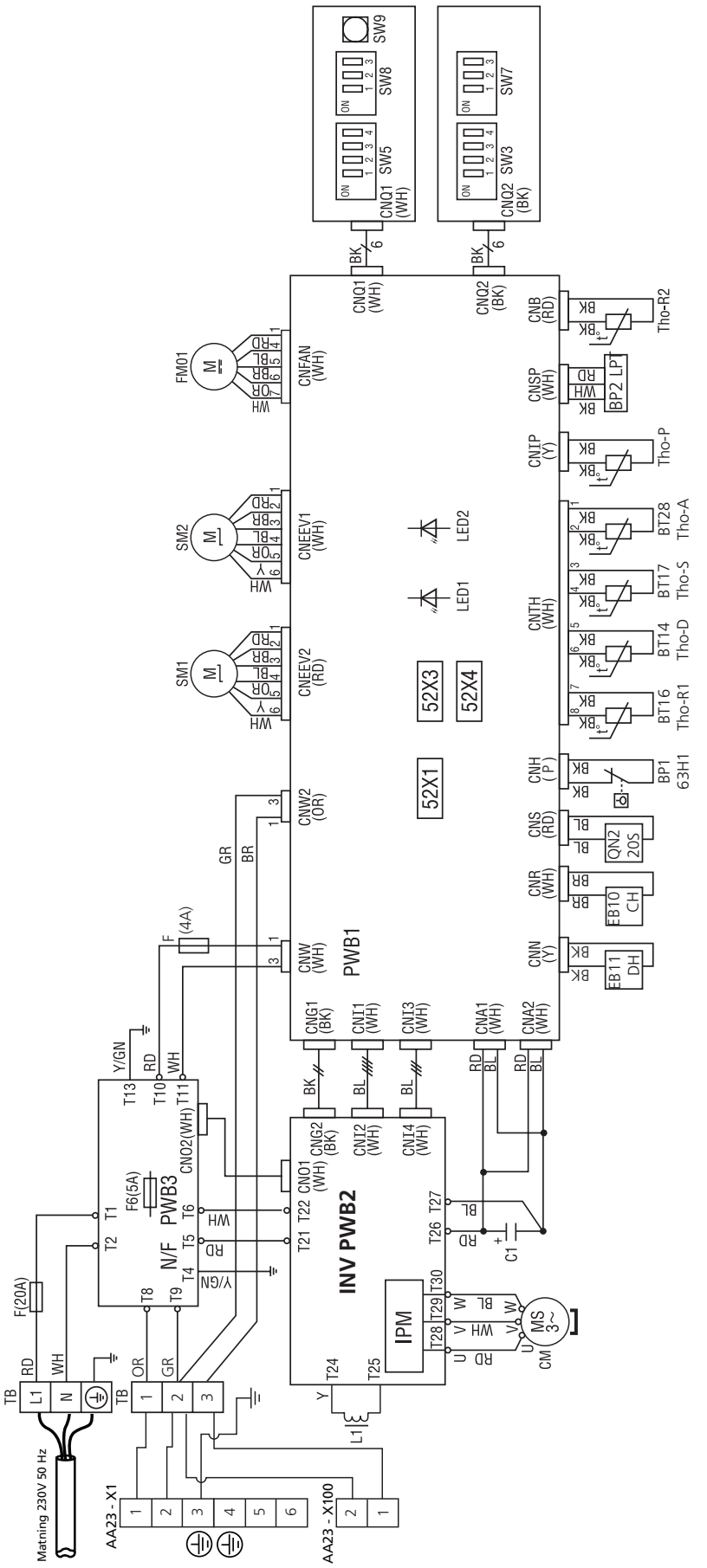
Electrical circuit diagram

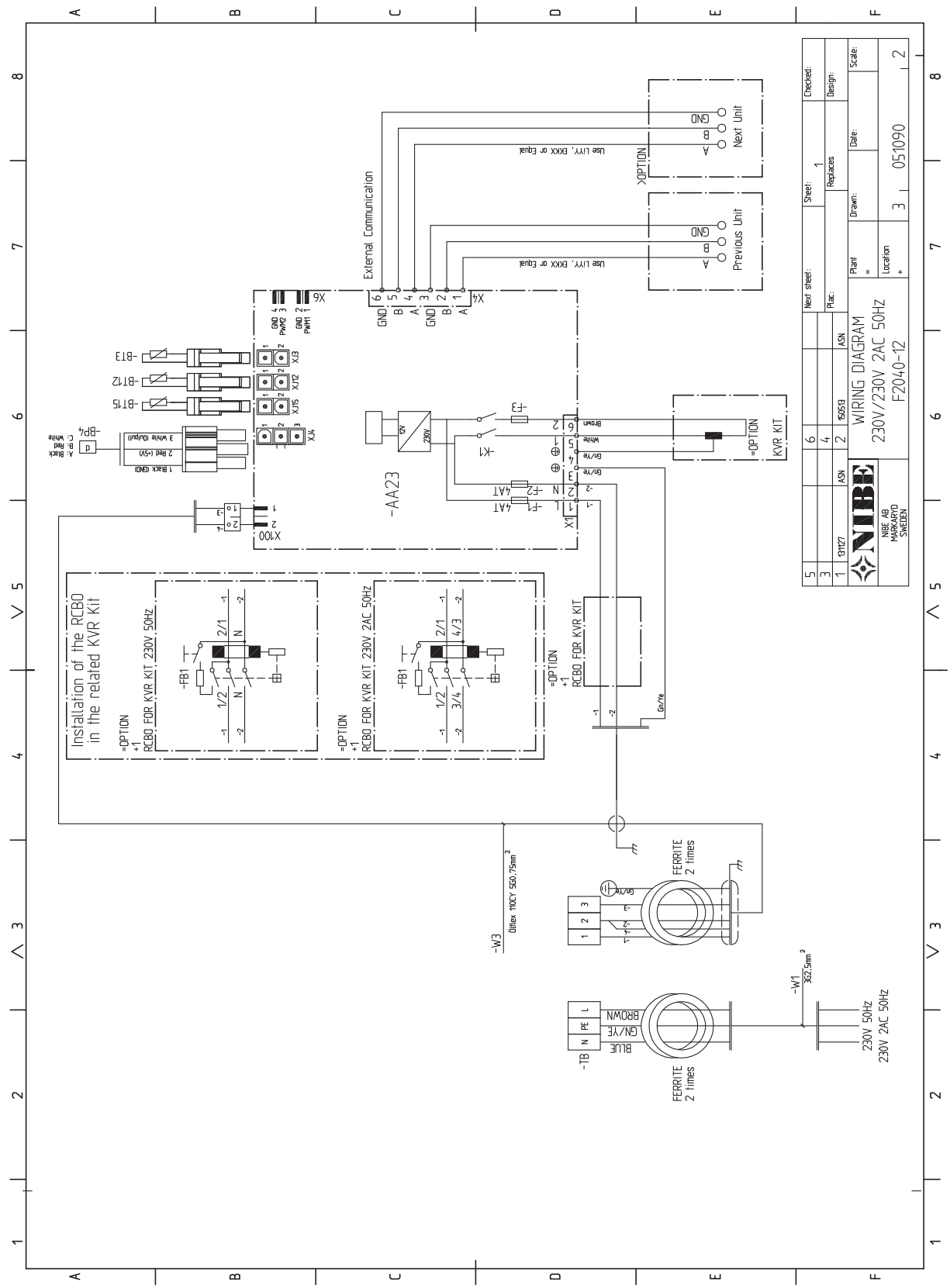
F2040-6

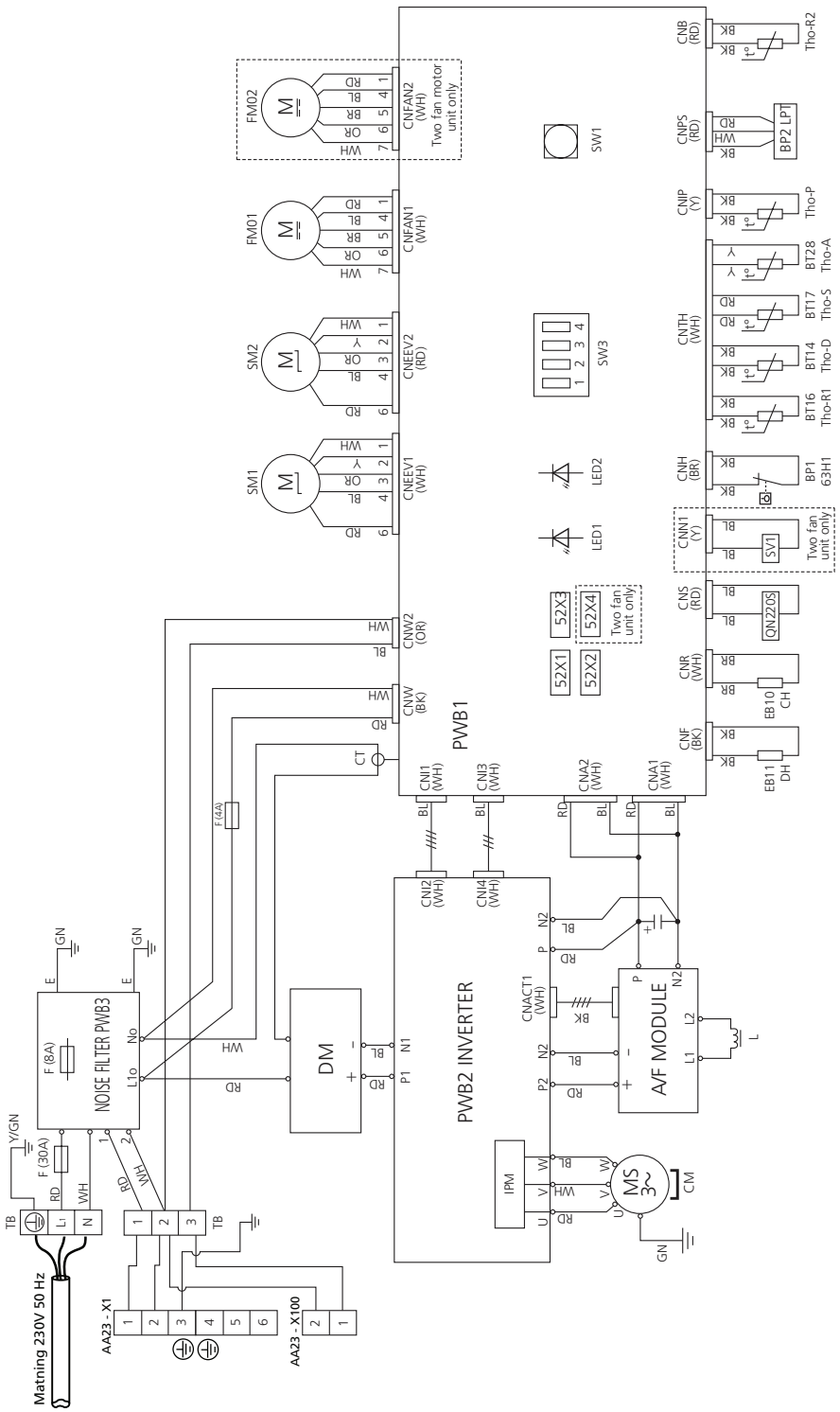


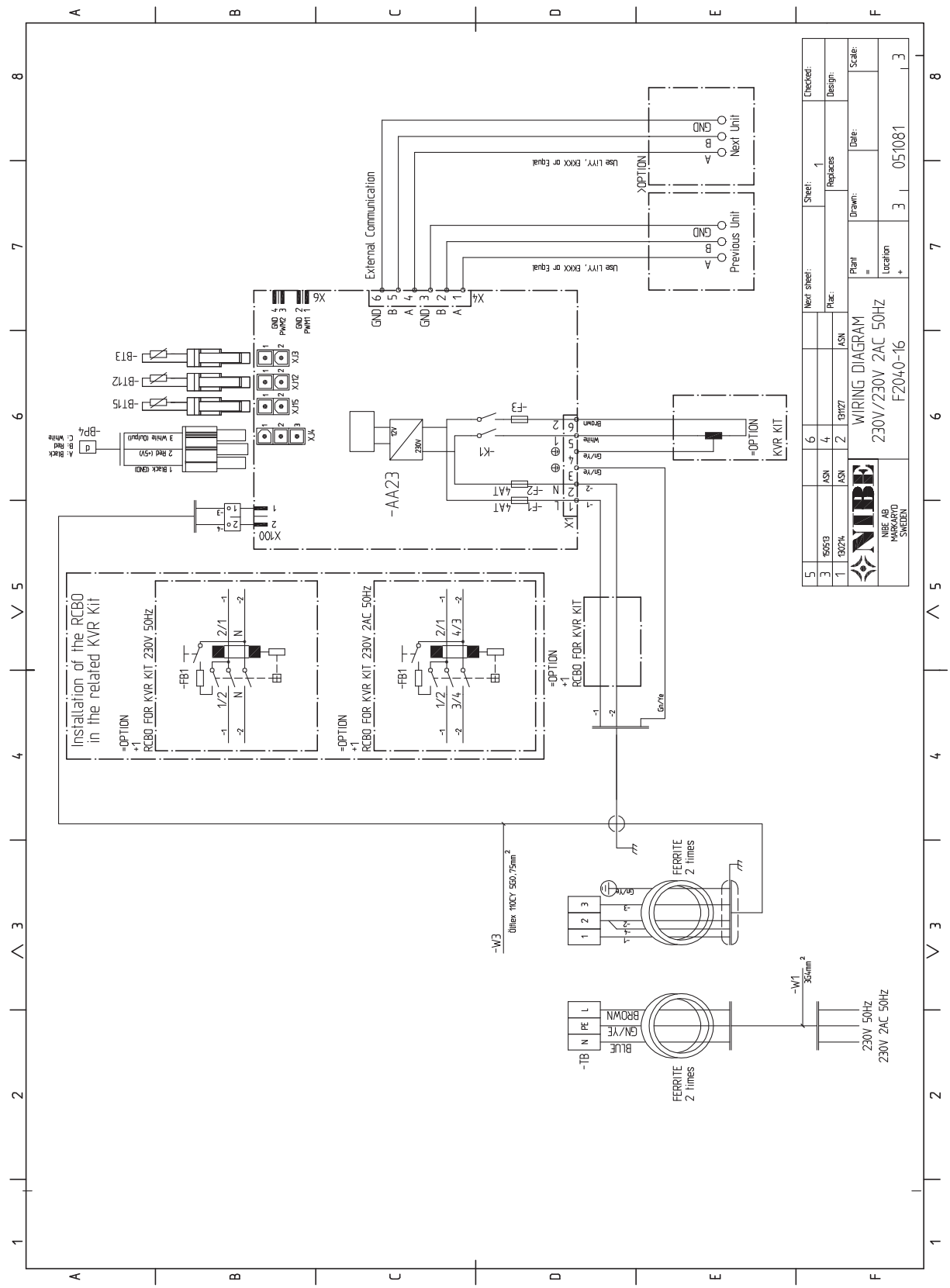

POWER SOURCE
1 PHASE
220–240V 50Hz
220V 60Hz
TERMINAL BLOCK 1 TB1
TERMINAL BLOCK 2 TB2
TO INDOOR UNIT
POWER WIRES
SIGNAL WIRE
EARTH WIRE
PWB ASSY PWB1
DIODE STACK1
DIODE STACK2
SWITCHING POWER CIRCUIT
PAM CIRCUIT
PAM CIRCUIT
POWER TRANSISTOR
F1 F 3.15A L 250V
F3 T 1A L 250V
F4 250V 20A
F6 T 1A L 250V
F8 250V 20A
CM
FMo
CNFAN (WH)
CNEEV (WH)
EEV
CNTH (BK)
TH1
TH2
TH3
CNHEAT (WH)
H
CN20S (RD)
20S
R.IN
S.IN
G1
G2
C–2

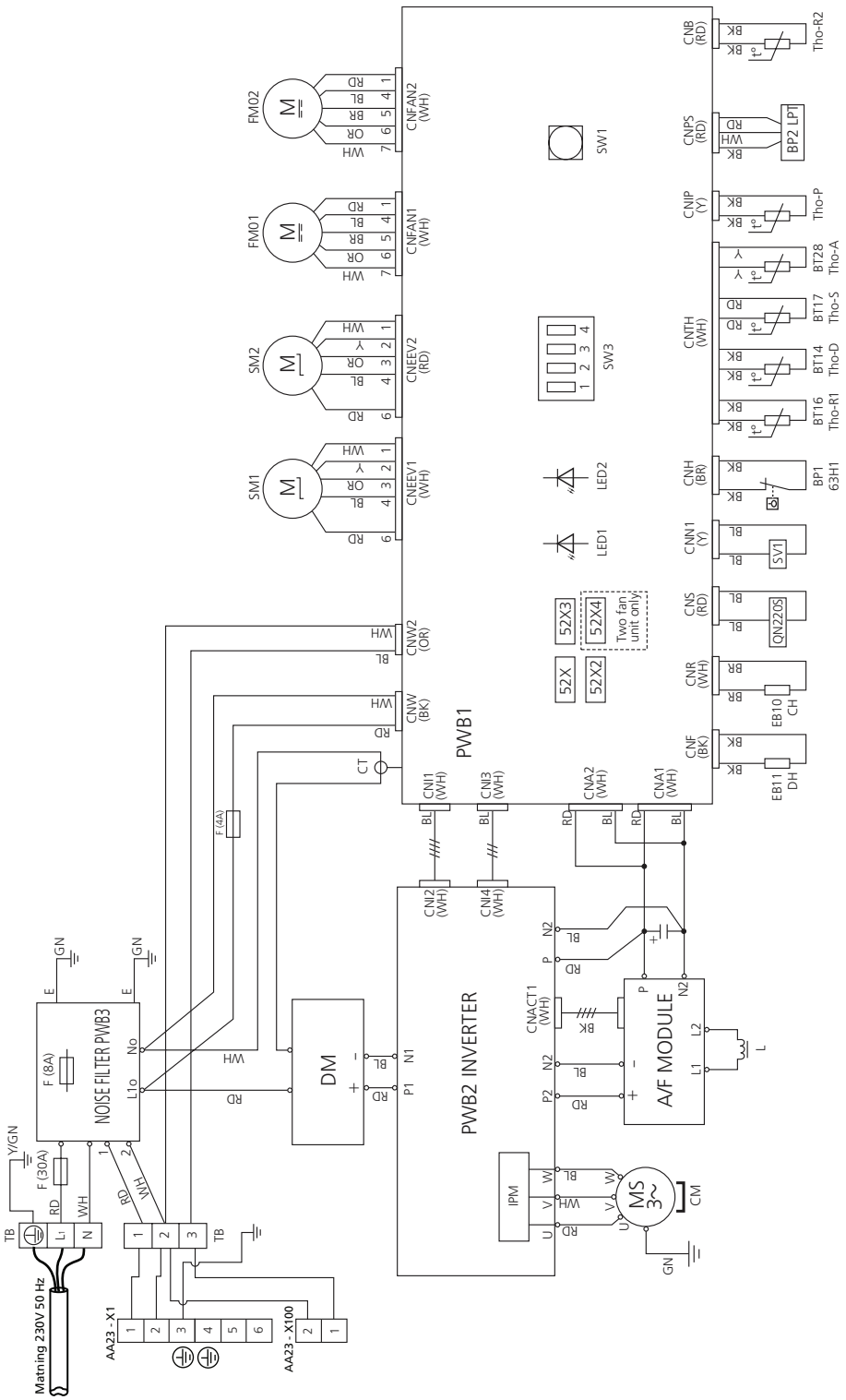

WIRING DIAGRAM F2040-8
ELSCHEMA F2040-8
230V ~ / 230V 2~ 50Hz
051083 7
Dimension
230V/230V 2~50Hz
Revision note
Material Quality/Specification
Mass (kg)
Rev by
Rev Checked by
Rev date (YYYY-MM-DD)
Designer
Checked by
Date (YYYY-MM-DD)
Status
Plant
Format
Next sheet:
Sheet:
Location
Drawing no
Rev
External Communication
FERRITE
Use LiYY, EKXX or Equal
Next Unit
Previous Unit
>OPTION
-AA23
-K1
-F3
-F1 4AT
-F2 4AT
-FB1
-BT3
-BT12
-BT15
-BP4
-TB
-W1
-W3
Ölflex 110CY 5G0,75mm²
3G2,5mm²
230V 50Hz
230V 2~ 50Hz
FERRITE 2 Times
Installation of the RCBO in the related KVR Kit
=OPTION +1 RCBO FOR KVR KIT 230V 50Hz
=OPTION +1 RCBO FOR KVR KIT 230V 2~ 50Hz
=OPTION +1 KVR KIT
=OPTION +1 RCBO FOR KVR KIT
BLUE
BROWN
GN/YE


Matning 230V 50 Hz
AA23 - X1
AA23 - X100
PWB1
INV PWB2
PWB3
N/F
IPM
52X1
52X3
52X4
LED1
LED2
SW9
SW8
SW7
SW5
SW3
CNQ1 (WH)
CNQ2 (BK)
CNFAN (WH)
CNEEV1 (WH)
CNEEV2 (RD)
CNW2 (OR)
CNW (WH)
CNG1 (BK)
CNI1 (WH)
CNI3 (WH)
CNA1 (WH)
CNA2 (WH)
CNG2 (BK)
CNI2 (WH)
CNI4 (WH)
CNO1 (WH)
CNO2(WH)
CNB (RD)
CNSP (WH)
CNTP (Y)
CNTH (WH)
CNH (P)
CNS (RD)
CNR (WH)
CNN (Y)
FM01
SM1
SM2
F(20A)
F(4A)
F6(5A)
C1
L1
MS 3~
BP2 LPT
BP1
63H1
BT28
BT17
BT14
BT16
Tho-R2
Tho-P
Tho-A
Tho-S
Tho-D
Tho-R1
QN2 20S
EB10 CH
EB11 DH


WIRING DIAGRAM
230V/230V 2AC 50Hz
F2040-12
051090
NIBE AB
MARKARYD
SWEDEN
External Communication
Next Unit
Previous Unit
-AA23
-X1
-X4
-X6
-X100
-BT3
-BT12
-BT15
-GP4
-K1
-F1
-F2
-F3
-OPTION
KVR KIT
Installation of the RCBO
in the related KVR Kit
RCBO FOR KVR KIT 230V 50Hz
-FB1
-W3
-W1
-TB
FERRITE
2 times
230V 50Hz
230V 2AC 50Hz


PWB1
PWB2 INVERTER
NOISE FILTER PWB3
A/F MODULE
DM
IPM
MS 3~
CM
CT
F (8A)
F (30A)
F (4A)
Matning 230V 50 Hz
AA23 - X1
AA23 - X100
TB
FM01
FM02
SM1
SM2
CNFAN1 (WH)
CNFAN2 (WH)
Two fan motor unit only
CNEEV1 (WH)
CNEEV2 (RD)
CNWV2 (OR)
CNWV (BK)
CNI1 (WH)
CNI2 (WH)
CNI3 (WH)
CNI4 (WH)
CNA1 (WH)
CNA2 (WH)
CNACT1 (WH)
CNB (RD)
CNPS (RD)
CNIP (Y)
CNTH (WH)
CNH (BK)
CNN1 (Y)
CNS (RD)
CNR (WH)
CNF (BK)
SW1
SW3
LED1
LED2
52X1
52X2
52X3
52X4
Two fan unit only
Two fan unit only
SV1
QN2205
EB10 CH
EB11 DH
BP1 63H1
BP2 LPT
BT16 Tho-R1
BT14 Tho-D
BT17 Tho-S
BT28 Tho-A
Tho-P
Tho-R2


WIRING DIAGRAM
230V/230V 2AC 50Hz
F2040-16
051081
NIBE AB
MARKARYD
SWEDEN
External Communication
Next Unit
Previous Unit
Use LiYY, EKKX or Equal
-AA23
-K1
-F1
-F2
-F3
4AT
KVR KIT
-OPTION
Installation of the RCBO in the related KVR Kit
RCBO FOR KVR KIT 230V 50Hz
-FB1
-W3
Ölflex 110CY 550 7.5mm²
-W1
-TB
FERRITE 2 Times
BLUE
BROWN
GN/YE
230V 50Hz
230V 2AC 50Hz


PWB1
PWB2 INVERTER
NOISE FILTER PWB3
A/F MODULE
DM
IPM
MS
3~
CM
SW1
SW3
LED1
LED2
52X
52X2
52X3
52X4
Two fan unit only
CT
F (8A)
F (30A)
F (4A)
TB
Matning 230V 50 Hz
AA23 - X1
AA23 - X100
FM02
FM01
SM2
SM1
CNFAN2 (WH)
CNFAN1 (WH)
CNEEV2 (RD)
CNEEV1 (WH)
CNWV2 (OR)
CNWV (BK)
CNI1 (WH)
CNI3 (WH)
CNI2 (WH)
CNI4 (WH)
CNA2 (WH)
CNA1 (WH)
CNACT1 (WH)
CNB (RD)
CNPS (RD)
CNIP (Y)
CNTH (WH)
CNH (BR)
CNN1 (Y)
CNS (RD)
CNR (WH)
CNF (BK)
BP2 LPT
BT28 Tho-A
BT17 Tho-S
BT14 Tho-D
BT16 Tho-R1
Tho-R2
Tho-P
BP1 63H1
SV1
QN2205
EB10 CH
EB11 DH
L

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AIR TO WATER HEAT PUMP COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the heat pump and associated equipment as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission this equipment to the manufacturer's instructions may invalidate the warranty but does not affect statutory rights.

Customer Name

Address

Telephone Number

Heat Pump Make and Model

Heat Pump Serial Number

Commissioned by (print name) | Certified Operative Reg. No. [1]

Company Name & Address | Commissioning Date

Telephone No.

Building Regulations Notification Number (if applicable) [2]

CONTROLS - SYSTEM AND HEAT PUMP

Tick the appropriate boxes if applicable

1.	Time & Temperature Control to Heating	Room Thermostat & Programmer/Timer ☐	Programmable Roomstat ☐	Load/Weather Compensation ☐	Optimum Start Control ☐		
2.	Time & Temperature Control to Hot Water			Cylinder Thermostat & Programmer/Timer ☐	Combined with Heat pump main controls ☐		
3.	Heating Zone Valves			Fitted ☐	Not Required ☐		
4.	Hot Water Zone Valves			Fitted ☐	Not Required ☐		
5.	Thermostatic Radiator Valves			Fitted ☐	Not Required ☐		
6.	Heat Pump Safety Interlock [3]			☐	Provided ☐		
7.	Outdoor Sensor			Fitted ☐	Not Required ☐		
8.	Automatic Bypass System			Fitted ☐	Not Required ☐		
9.	Buffer Vessel Fitted			Yes ☐	No ☐	If YES, Volume ☐ Litres	

ALL SYSTEMS

The heating system has been filled and pressure tested — Yes ☐

Expansion vessel for heating is sized, fitted & charged in accordance with manufacturer's instructions — Yes ☐

The heat pump is fitted on a solid/stable surface capable of taking its weight — Yes ☐

The system has been flushed and cleaned in accordance with BS7593 and heat pump manufacturer's instructions — Yes ☐

What system cleaner was used?

What inhibitor was used? — Qty litres ☐

Is the system adequately frost protected? — Yes ☐

OUTDOOR COLLECTOR

Are all external pipeworks insulated? — Yes ☐

Is the fan free from obstacles and operational? — Yes ☐

Has suitable consideration been made for waste water discharge? — Yes ☐

CENTRAL HEATING MODE

Heating Flow Temperature ☐ °C Heating Return Temperature ☐ °C

DOMESTIC HOT WATER MODE

Is the heat pump connected to a hot water cylinder? ☐ Unvented ☐ Vented ☐ Thermal Store ☐ Not Connected

Hot water has been checked at all outlets — Yes ☐

ADDITIONAL SYSTEM INFORMATON

Additional heat sources connected

☐ Gas Boiler ☐ Oil Boiler ☐ Electric Heater Other

ALL INSTALLATIONS

The heating, hot water and ventilation systems complies with the appropriate Building Regulations — Yes ☐

All electrical work complies with the appropriate Regulations — Yes ☐

The heat pump and associated products have been installed and commissioned in accordance with the manufacturer's instructions — Yes ☐

The operation of the heat pump and system controls have been demonstrated to the customer — Yes ☐

The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer — Yes ☐

Commissioning Engineer's Signature

Customer's Signature

(To confirm demonstration of equipment and receipt of appliance instructions)

Notes: [1] Installers should be members of an appropriate Competent Persons Scheme. [2] All installations in England and Wales must be notified to Local Area Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer. [3] May be required for systems covered by G3 Regulations

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benchmark COLLECTIVE MARK
THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

www.centralheating.co.uk

Service Record

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

Service Provider

Before completing the appropriate Service Interval Record below, please ensure you have carried out the service as described in the manufacturer's instructions.

Always use the manufacturer's specified spare part when replacing controls.

Service 1 Date:

Engineer Name:

Company Name:

Telephone No.

Operative ID No.

Comments:

Signature:

Service 2 Date:

Engineer Name:

Company Name:

Telephone No.

Operative ID No.

Comments:

Signature:

Service 3 Date:

Engineer Name:

Company Name:

Telephone No.

Operative ID No.

Comments:

Signature:

Service 4 Date:

Engineer Name:

Company Name:

Telephone No.

Operative ID No.

Comments:

Signature:

Service 5 Date:

Engineer Name:

Company Name:

Telephone No.

Operative ID No.

Comments:

Signature:

Service 6 Date:

Engineer Name:

Company Name:

Telephone No.

Operative ID No.

Comments:

Signature:

Service 7 Date:

Engineer Name:

Company Name:

Telephone No.

Operative ID No.

Comments:

Signature:

Service 8 Date:

Engineer Name:

Company Name:

Telephone No.

Operative ID No.

Comments:

Signature:

Service 9 Date:

Engineer Name:

Company Name:

Telephone No.

Operative ID No.

Comments:

Signature:

Service 10 Date:

Engineer Name:

Company Name:

Telephone No.

Operative ID No.

Comments:

Signature:

NIBE Energy Systems Ltd
3C Broom Business Park,
Bridge Way, S41 9QG Chesterfield
Tel: +44 (0)845 095 1200
info@nibe.co.uk
nibe.co.uk

IHB EN 1848-8 231846

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