



Installer manual
Air/water heat pump
JÄSPI Inverter Nordic R

Table of Contents

1	Important information _____	4	9	Disturbances in comfort _____	35
	Safety information _____	4		Troubleshooting _____	35
	Symbols _____	4		Alarm list _____	37
	Marking _____	4	10	Accessories _____	40
	Serial number _____	4	11	Technical data _____	41
	Inspection of the installation _____	5		Dimensions _____	41
2	Delivery and handling _____	6		Sound levels _____	43
	Transport _____	6		Technical specifications _____	44
	Assembly _____	7		Energy labelling _____	51
	Condensation _____	8		Electrical circuit diagram _____	58
	Supplied components _____	9		Item register _____	70
	Handling panels _____	10		Contact information _____	75
	Installation of automatic gas separator _____	11			
3	The heat pump design _____	14			
	General _____	14			
	Distribution boxes _____	20			
4	Pipe connections _____	22			
	General _____	22			
	Symbol key _____	22			
	Pipe coupling heating medium circuit _____	23			
5	Electrical connections _____	24			
	General _____	24			
	Accessibility, electrical connection _____	24			
	Connections _____	25			
6	Commissioning and adjusting _____	29			
	Preparations _____	29			
	Filling and venting _____	29			
	Readjusting, heating medium side _____	29			
	Commissioning _____	29			
	Adjustment, charge flow _____	30			
	Charge pump _____	30			
	Pressure drop, heating medium side _____	30			
7	Control _____	31			
	General _____	31			
	Control conditions _____	31			
	Activating JÄSPI Inverter Nordic R _____	32			
8	Service _____	34			
	Service actions _____	34			

Important information

Safety information

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

The manual must be left with the customer.

For the latest version of the product's documentation, see kaukora.fi.



CAUTION!

Read the enclosed safety manual before installation or servicing.

Symbols

Explanation of symbols that may be present in this manual.



CAUTION!

This symbol indicates danger to person or machine.



NOTE!

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



TIP!

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

Marking

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



Fire hazard!



Dangerous voltage.



Read the User Manual.



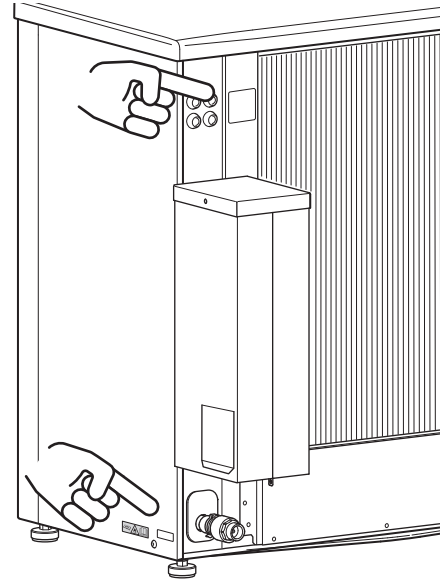
Read the Installer Manual.



Disconnect the voltage supply before starting work.

Serial number

The serial number on JÄSPI Inverter Nordic R can be found on the rear cover and at the bottom on the side on the type plate (PZ1).



NOTE!

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

Inspection of the installation

Current regulations require the heating installation to undergo an installation inspection before it is commissioned. The inspection must be carried out by a suitably qualified person. In addition, fill in the page for information regarding the installation data in the User Manual.

✓	Description	Notes	Signature	Date
	Heating medium (page 22)			
	Automatic gas separator installed			
	System flushed			
	System vented			
	Particle filter			
	Shut-off valve			
	Charge flow set			
	Electricity (page 24)			
	Fuses property			
	Safety breaker			
	Earth circuit-breaker			
	Heating cable type/effect			
	Fuse size, heating cable (F3)			
	Communication cable connected			
	JÄSPI Inverter Nordic R addressed (only when cascade connection)			
	Cooling permitted			
	Connections			
	Main voltage			
	Phase voltage			
	Miscellaneous			
	Update to the latest version of the software in the indoor module/control module.			
	Condensation water pipe			
	Insulation for condensation water pipe, thickness (unless KVR 11 is used)			



CAUTION!

Check the connections, main voltage and phase voltage before powering up the heat pump, to prevent damage to the heat pump electronics.

Delivery and handling

Transport

JÄSPI Inverter Nordic R should be transported and stored vertically in a dry place.



CAUTION!

Ensure that the heat pump cannot fall over during transport.

Check that JÄSPI Inverter Nordic R has not been damaged during transport.

LIFT TO INSTALLATION LOCATION

If the surface allows, the easiest method is to use a pallet truck to move the heat pump to the installation area.

The centre of gravity is offset to one side (see print on the packaging).

If the heat pump needs to be transported across soft ground, such as a lawn, we recommend using a crane truck that can lift it to the installation location.

When lifting the heat pump with a crane, the packaging must be intact.

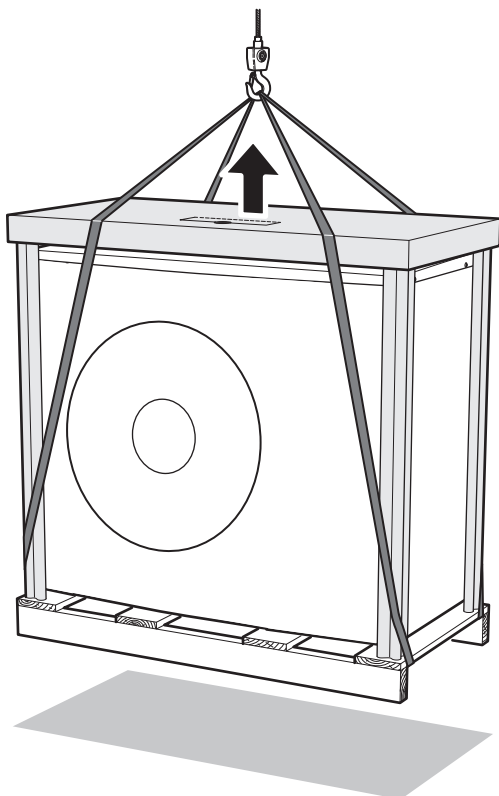
If a crane truck cannot be used, the heat pump can be transported on an extended sack truck. The heat pump must be taken hold of from its heaviest side and two people are required to lift it.

LIFT FROM THE PALLET TO FINAL POSITIONING

1. Remove the packaging.
2. Dismantle the load anchor to the pallet.
3. Place lifting straps around each machine foot. Four people are recommended for lifting from the pallet to the foundation, one for each lifting strap.

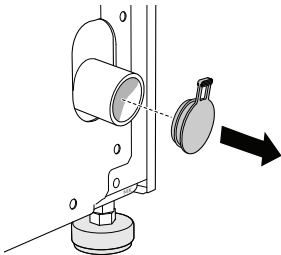
SCRAPPING

When scrapping, remove the heat pump in reverse order. In this case, lift by the base plate rather than the pallet.

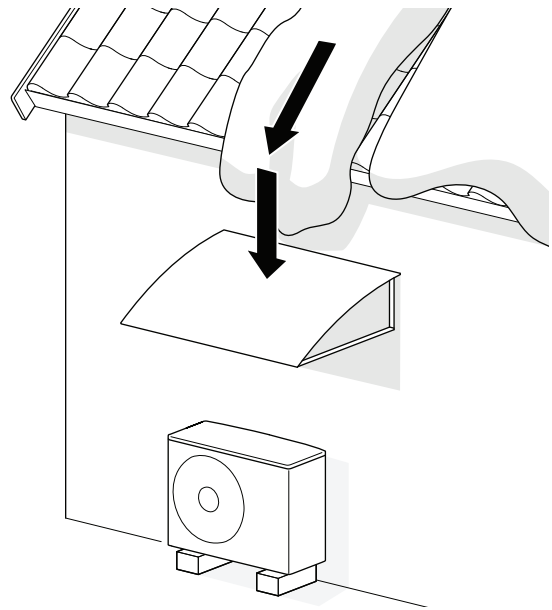


Assembly

- Place the heat pump in a suitable location outdoors to prevent any risk of the refrigerant flowing in through ventilation openings, doors or similar openings in the event of a leak. It must also not constitute a hazard to people or property in any other way.
- If the heat pump is placed in a location where any refrigerant leak could accumulate, for example below ground level (in a dip or low-lying recess), the installation must satisfy the same requirements that apply for gas detection and the ventilation of engineering rooms. Requirements regarding sources of ignition must be applied where appropriate. Follow local rules and regulations.
- Place JÄSPI Inverter Nordic R 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.
- JÄSPI Inverter Nordic R should not be positioned next to noise sensitive walls, for example, next to a bedroom.
- Also ensure that the placement does not inconvenience the neighbours.
- JÄSPI Inverter Nordic R must not be placed so that recirculation of the outdoor air is possible. Recirculation entails reduced power and impaired efficiency.
- The evaporator must be sheltered from direct wind / , which negatively affects the defrosting function. Place JÄSPI Inverter Nordic R protected from wind / against the evaporator.
- Do not install JÄSPI Inverter Nordic R in locations where there might be substances in the atmosphere that might affect the unit, such as sulphide gas, chlorine, acid or alkaline substances, very salty air.
- Do not install JÄSPI Inverter Nordic R in locations where powder may be present in the air, such as carbon fibre, metal powder.
- A small amount of water may drip from the drainage hole under JÄSPI Inverter Nordic R. Make sure that the water can run away by selecting a suitable material underneath JÄSPI Inverter Nordic R (see section "Condensation").
- If the product has a plug covering the condensation drain connection (XL40), remove it.



- 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.



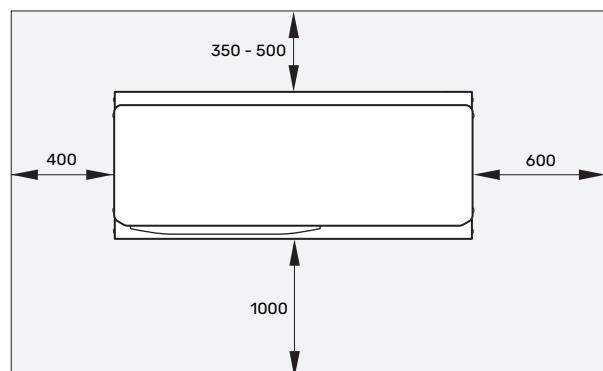
INSTALLATION AREA

Leave a free space of at least 350 mm between JÄSPI Inverter Nordic R and the house wall, but not more than 500 mm in windy locations.

Leave a free space of 1,000 mm in front of, and 1,000 mm above, the product.

Approx. 600 mm free space is required on the right-hand side to allow the side panel to be removed.

The heat pump must be installed so that its lower edge is at least level with the average local snow depth. The installation must be adjusted to ensure that condensation is effectively routed to the designated drain.



Condensation

The condensate drain pan collects and leads away the condensation water.



CAUTION!

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.

Pipe with heating cable (KVR), for draining the condensate drip tray, is not included. To guarantee this function, the accessory KVR should be used.

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

DRAINAGE OF CONDENSATION

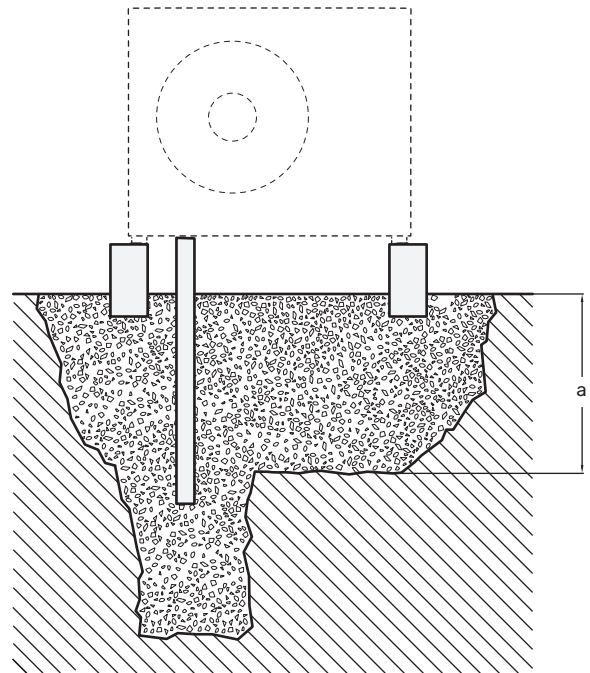


NOTE!

If none of the following recommended alternatives is used, good drainage of condensation must be provided.

Stone caisson

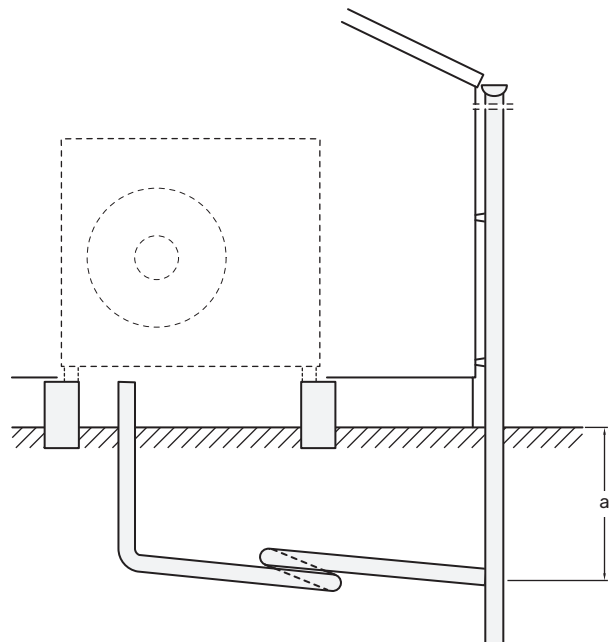
If the house has a cellar the stone caisson must be positioned so that condensation water does not affect the house. Otherwise, the stone caisson can be positioned directly below the heat pump.



a = Frost-free depth

Gutter drainage

Route the pipe sloping down from the heat pump. The condensation water pipe must have a water seal to prevent air circulation in the pipe.



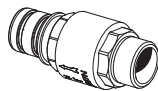
a = Frost-free depth

Supplied components

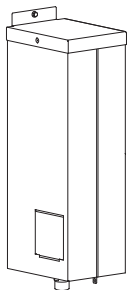
JÄSPI INVERTER NORDIC R-8, -12



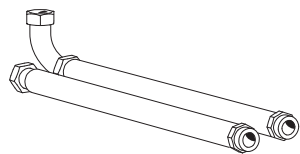
Filterball (G1") (QZ2)



Non-return valve (RM1.2)



Automatic gas separator (QZ3)



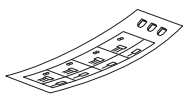
Flexible pipe with bend (WN2)

Flexible pipe (WN3)

(Dimensions, flexible pipes

DN25, G1")

Gaskets (4 pcs)

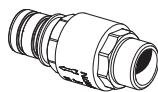


Labels for external control
voltage of the control system
(2 pcs)

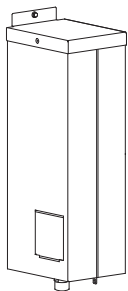
JÄSPI INVERTER NORDIC R-16, -20



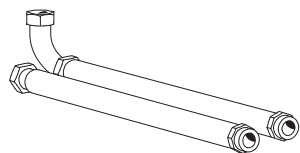
Filterball (G1 1/4") (QZ2)



Non-return valve (RM1.2)



Automatic gas separator (QZ3)



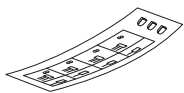
Flexible pipe with bend (WN2)

Flexible pipe (WN3)

(Dimensions, flexible pipes

DN25, G1 1/4")

Gaskets (4 pcs)

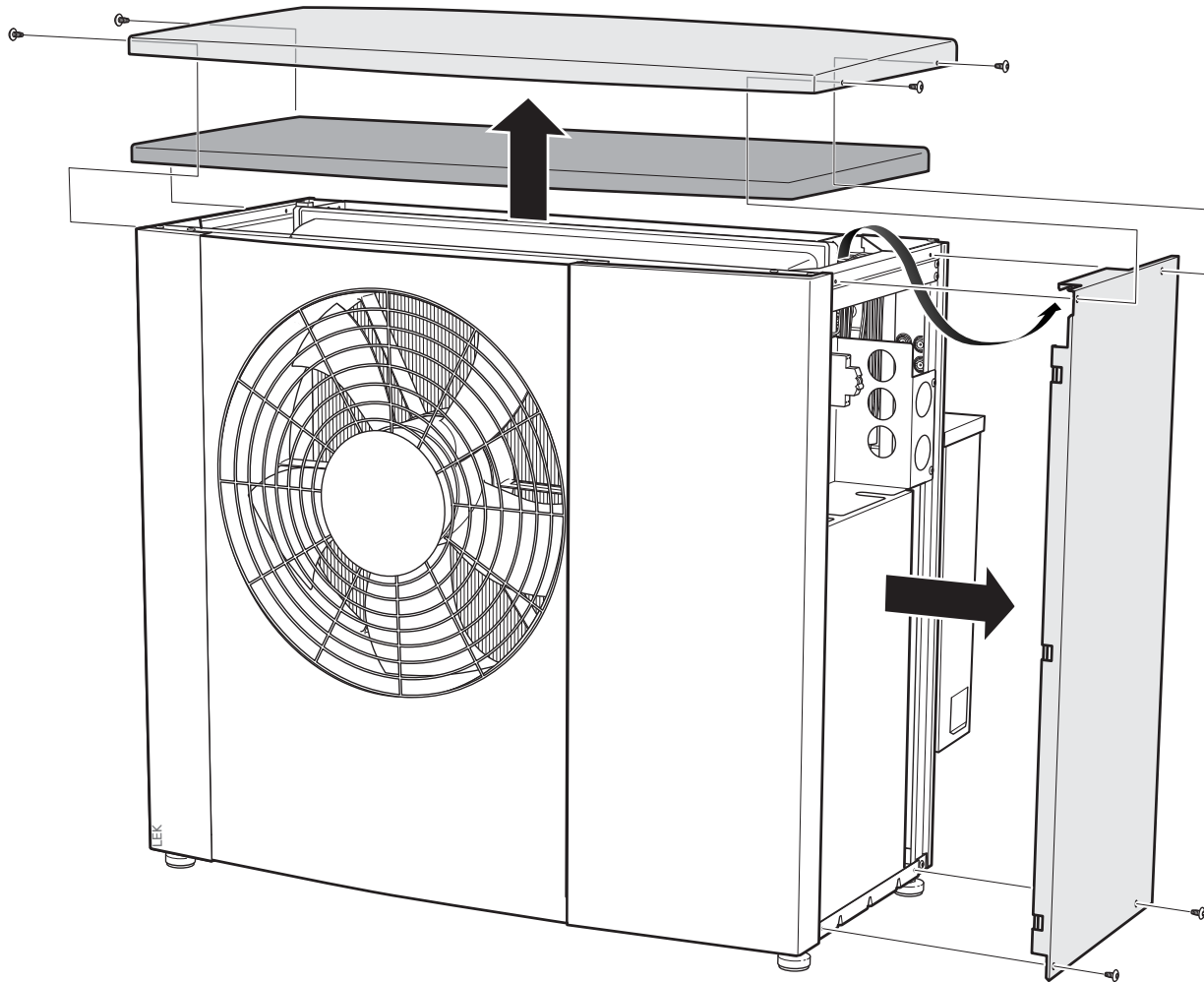


Labels for external control
voltage of the control system
(2 pcs)

Handling panels

REMOVE SIDE PANEL AND TOP PANEL

Undo the screws, lift off the top panel and the top insulation¹.

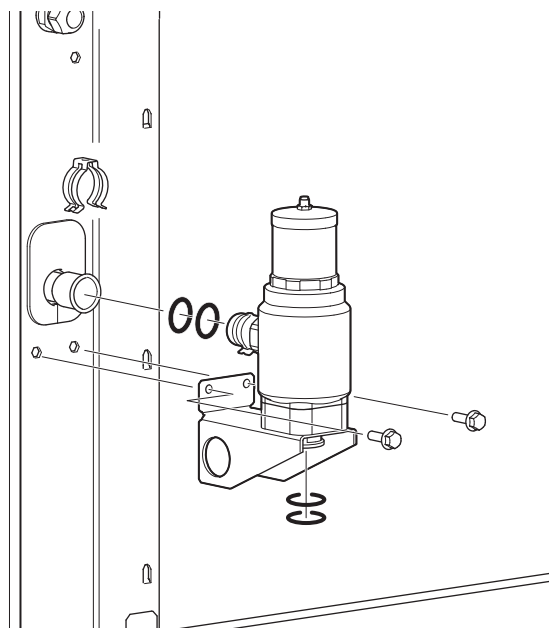


¹ Top insulation is only used for JÄSPI Inverter Nordic R-8/-12.

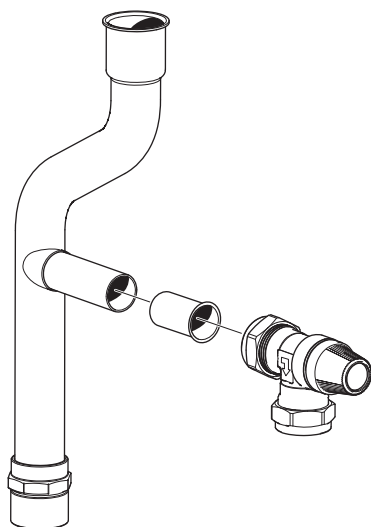
Installation of automatic gas separator

The automatic gas separator and the safety valve should always be installed as instructed below.

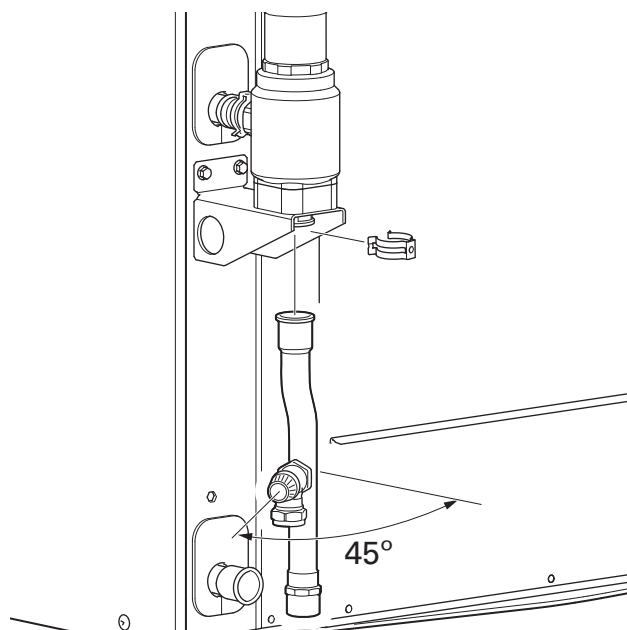
1. Check that all O-rings are present and that they are undamaged.
2. Lubricate the O-rings with soapy water or similar to make installation easier.
3. Press the gas separator into place.
4. Fit the clip. Twist the clip to ensure that it fastens properly.
5. Place the bracket in position, parallel with the outer edge. Secure the bracket with a screw. Use a socket wrench, size 10 mm.



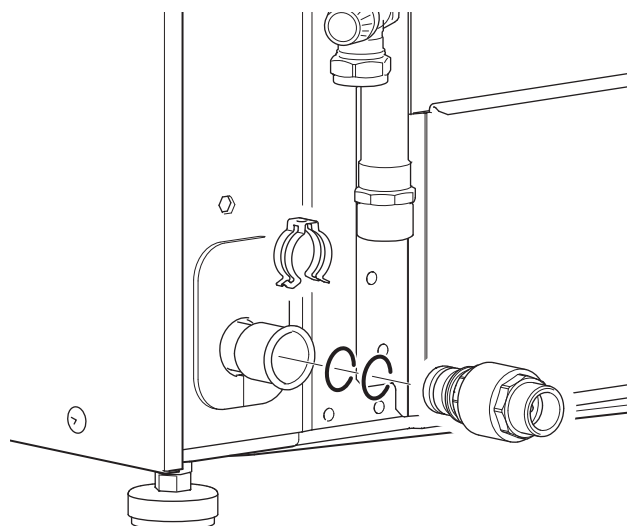
6. Assemble the parts of the safety valve. Ensure that the arrow for the outlet is pointing down.



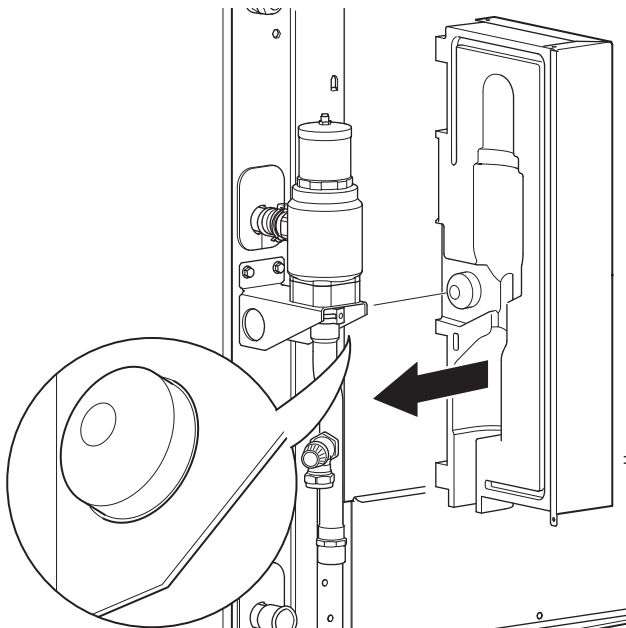
7. Then fit the safety valve with the associated pipes. The safety valve must be at an angle of 45°. Fit the clip. Twist the clip to ensure that it fastens properly.



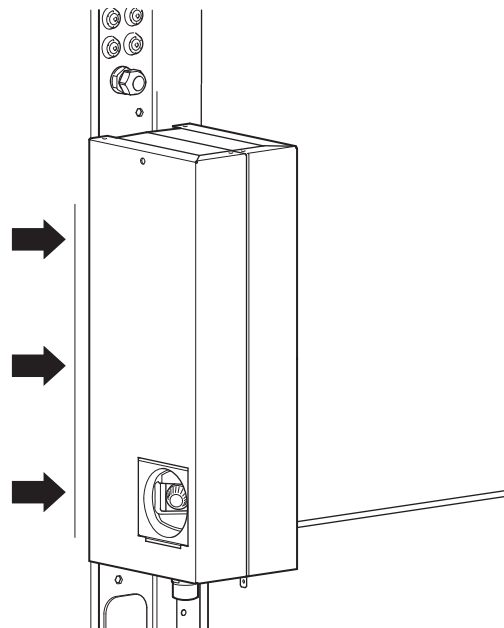
8. Install the non-return valve. Fit the clip. Twist the clip to ensure that it fastens properly.



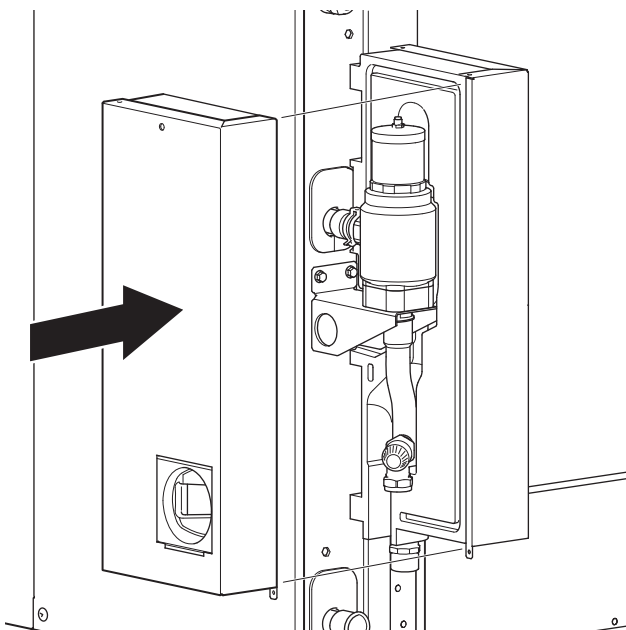
9. Install the right-hand side of the metal box. The lug in the insulation must go into the round hole in the bracket.



11. Check that both halves of the gas separator are properly in place, parallel with the edge of the heat pump.

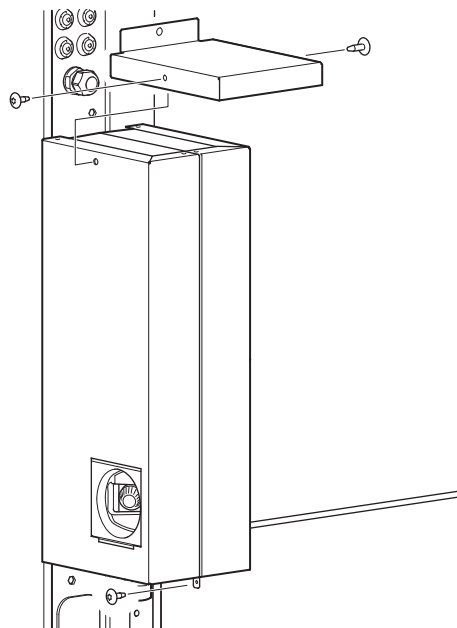


10. Fit the left-hand side in the same way.

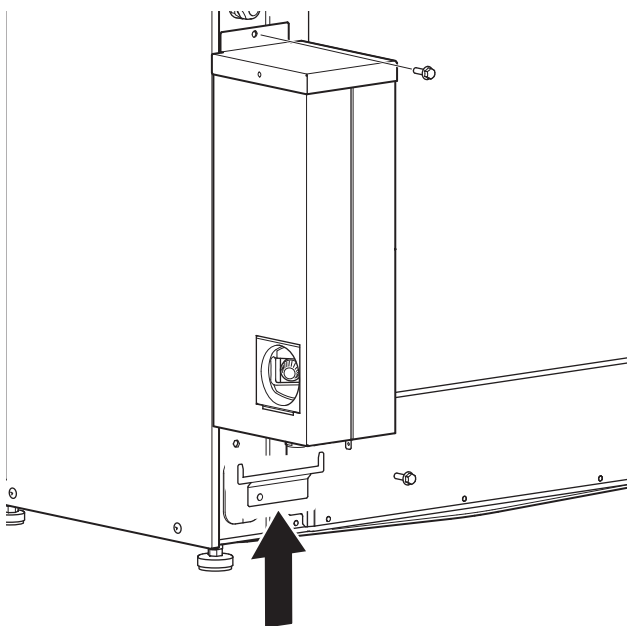


12. Fit the cover.

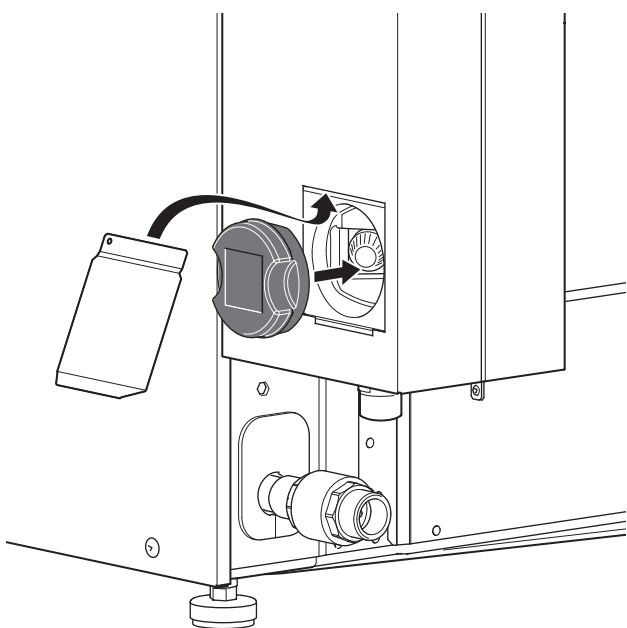
13. Secure with three screws. Two screws in the cover, on the right and left-hand sides, and one screw in the bottom.



14. Secure the gas separator to the heat pump using two screws, one at the top and one at the bottom.



15. Install the lid that conceals the safety valve.



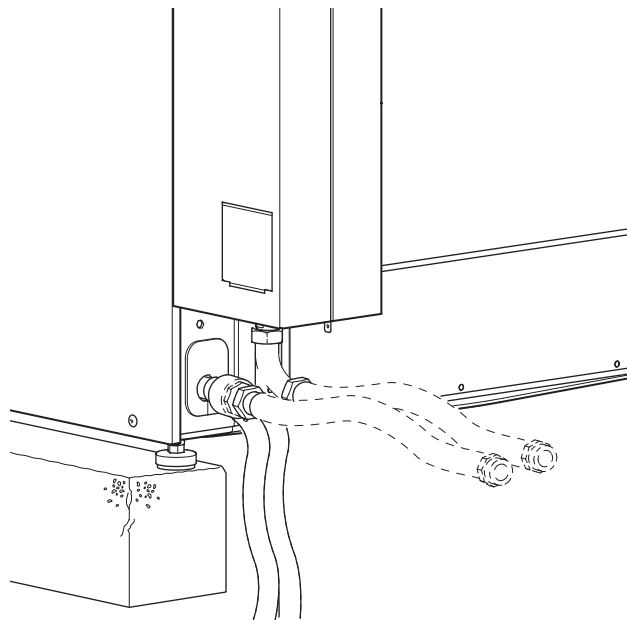
16. Screw the flexible pipes into place. The flexible pipes can be installed angled straight back or down, depending on which of the pipe connections the 90° bend is installed on.

Install the flexible pipes with a slight bend, so they can absorb any vibrations that would otherwise be propagated through the building.

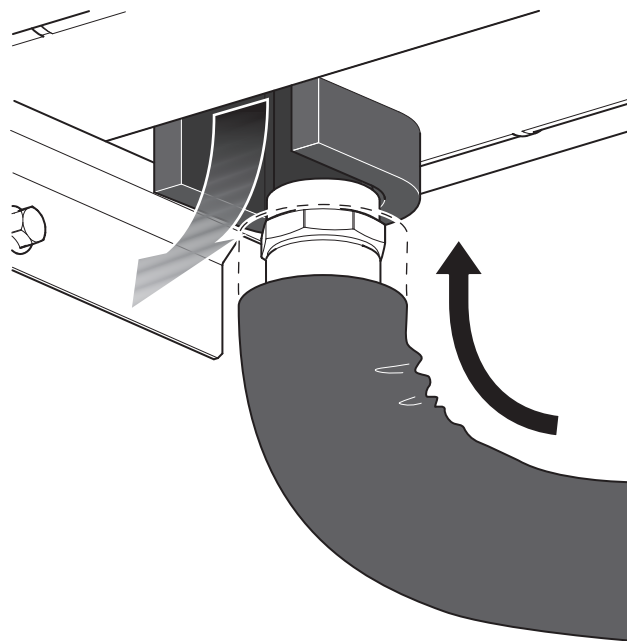


CAUTION!

Don't forget the flat gaskets.



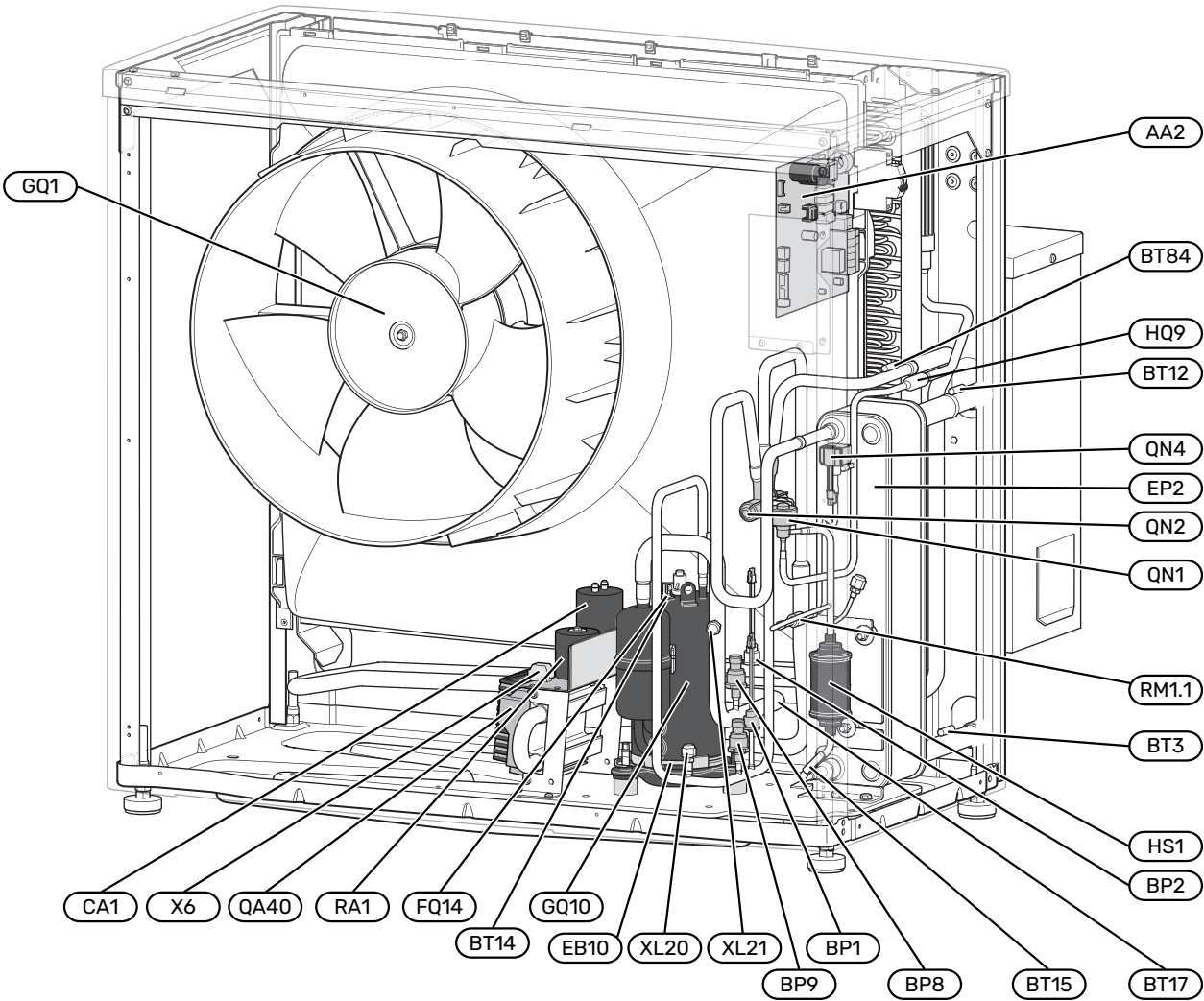
17. Check that the venting opening is not covered with pipe insulation. Pipe insulation should extend as far as the coupling and must not cover the opening.



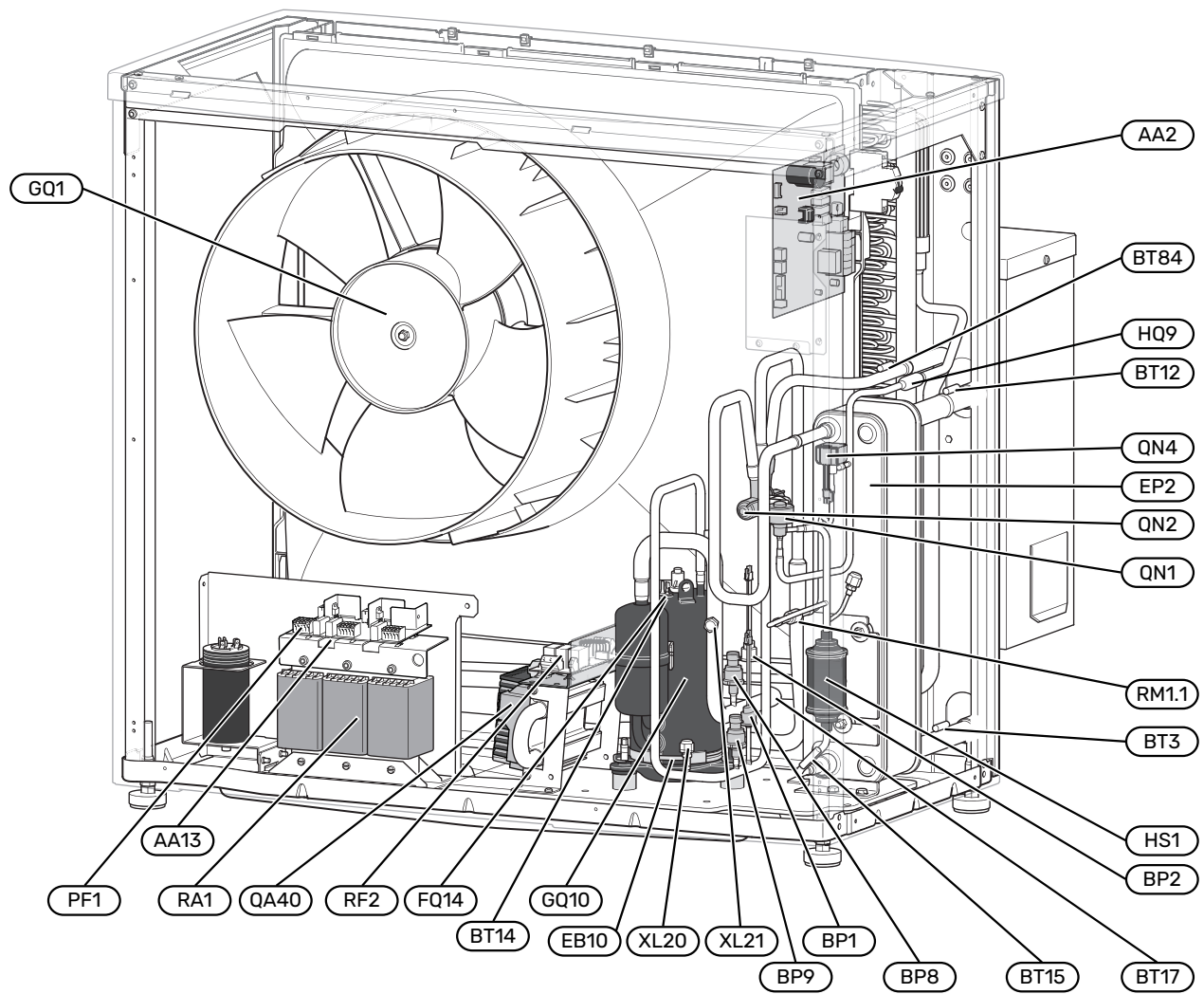
The heat pump design

General

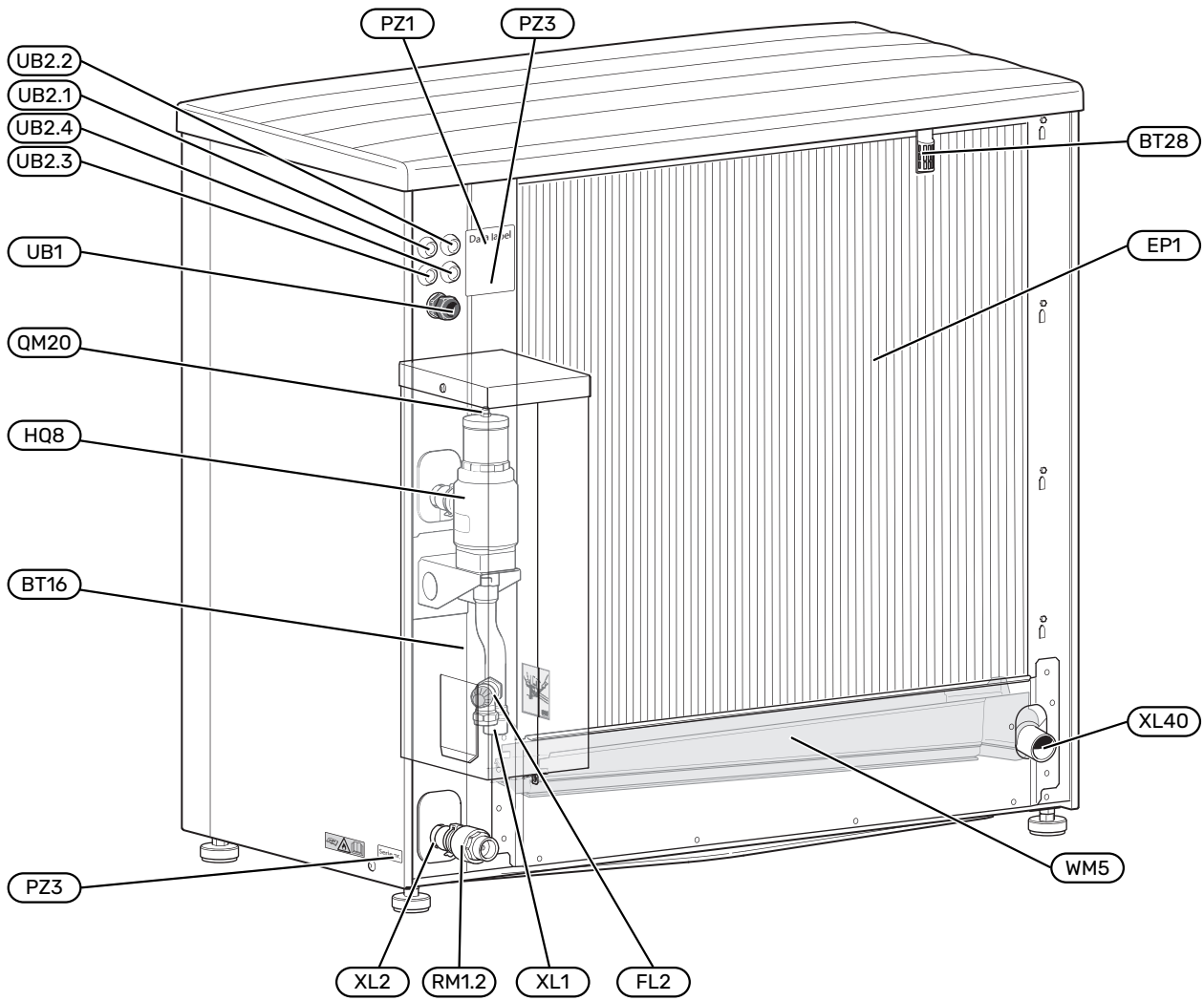
JÄSPI Inverter Nordic R-8 (1x230 V)



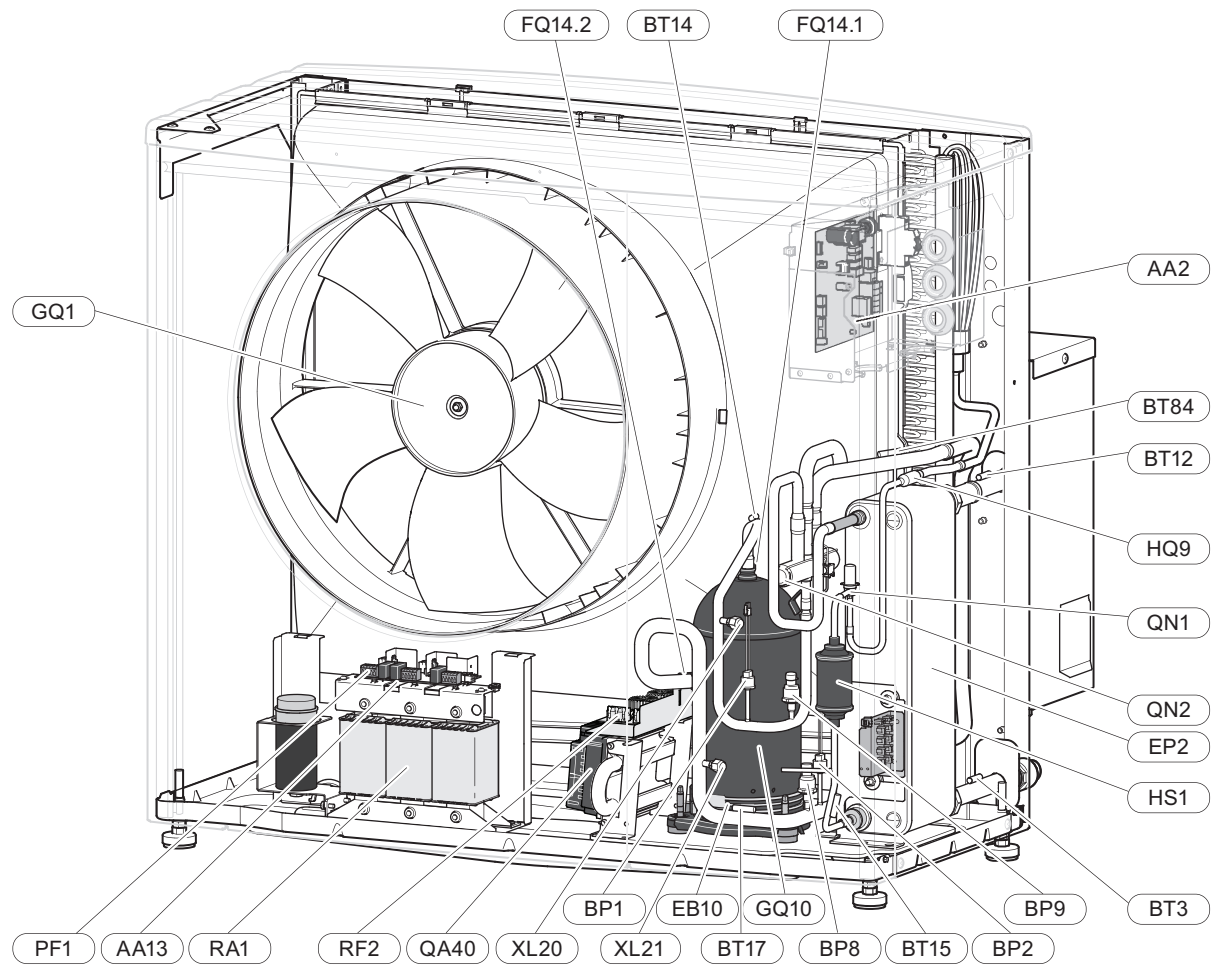
JÄSPI Inverter Nordic R-8, -12 (3x400 V)



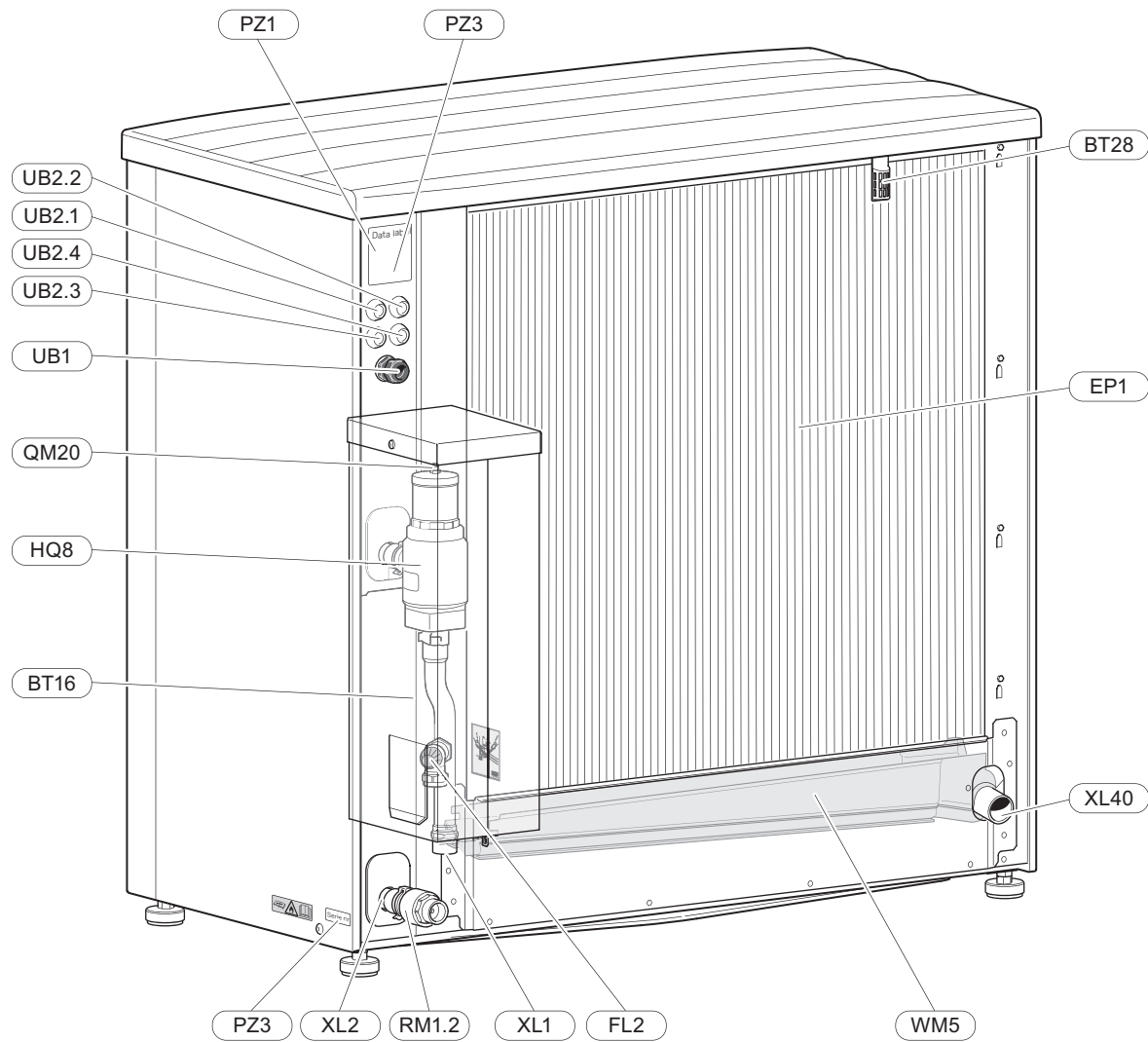
JÄSPI Inverter Nordic R-8, -12



JÄSPI Inverter Nordic R-16, -20 (3x400 V)



JÄSPI Inverter Nordic R-16, -20



PIPE CONNECTIONS

XL1	Heating medium connection, supply (out from JÄSPI Inverter Nordic R)
XL2	Heating medium connection, return (to JÄSPI Inverter Nordic R)
XL20	Service connection, high pressure
XL21	Service connection, low pressure
XL40	Condensation drain connection

HVAC COMPONENTS

FL2	Safety valve, climate system
HQ8	Automatic gas separator ¹
RM1.2	Non-return valve ¹
QM20	Vent valve, heating medium
WM5	Condensate drip tray

¹ Enclosed (not factory-fitted).

SENSORS ETC.

BP1	High pressure switch
BP2	Low pressure pressostat
BP8	Low-pressure sensor
BP9	High pressure sensor
BT3	Return line sensor
BT12	Condenser sensor, supply line
BT14	Hot gas sensor
BT15	Fluid line sensor
BT16	Evaporator sensor
BT17	Suction gas sensor
BT28	Ambient sensor
BT84	Suction gas sensor, evaporator

ELECTRICAL COMPONENTS

AA2	Base card
AA13	Triac board
CA1	Capacitor (1x230 V)
EB10	Compressor heater ¹
FQ14	Temperature limiter (Discharge), compressor ²
FQ14	Temperature limiter (Discharge), compressor
FQ14.1	Temperature limiter (Discharge), compressor ³
FQ14.2	Temperature limiter (Suction gas), compressor ³
GQ1	Fan
PF1	Signal lamp (LED)
QA40	Inverter module
RA1	Harmonic filter (3x400 V)
RA1	Choke (1x230 V)
RF2	EMC filter (3x400 V)
RF2	EMC Filter (1x230 V) ³
X6	Terminal block (1x230 V)

¹ JÄSPI Inverter Nordic R-8, -12 has 1 x compressor heater and JÄSPI Inverter Nordic R-16, -20 has 2 x compressor heaters.

² Included only in JÄSPI Inverter Nordic R-8/-12

³ Included only in JÄSPI Inverter Nordic R-16, -20

COOLING COMPONENTS

EP1	Evaporator
EP2	Condenser
GQ10	Compressor
HQ9	Particle filter
HS1	Drying filter
QN1	Expansion valve
QN2	Reversing valve
QN4	Bypass valve ¹
RM1.1	Non-return valve

¹ Only in JÄSPI Inverter Nordic R-8/-12.

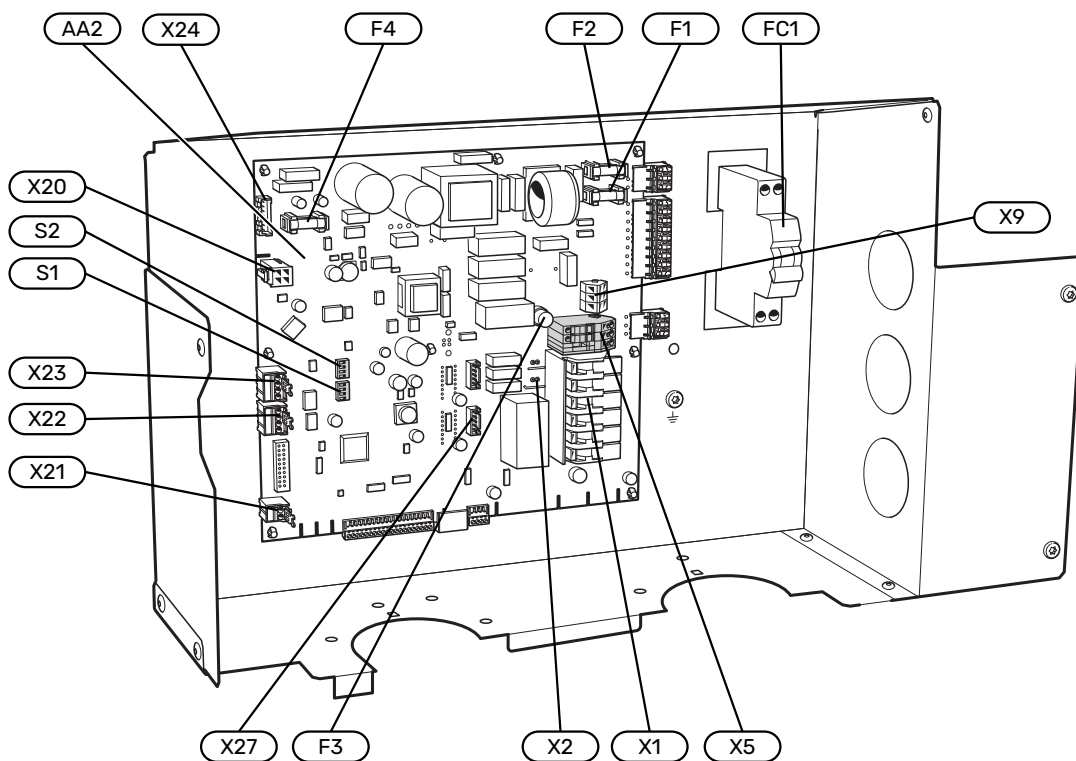
MISCELLANEOUS

PZ1	Rating plate
PZ3	Serial number plate
UB1	Cable gland, incoming supply
UB2	Cable grommet, communication

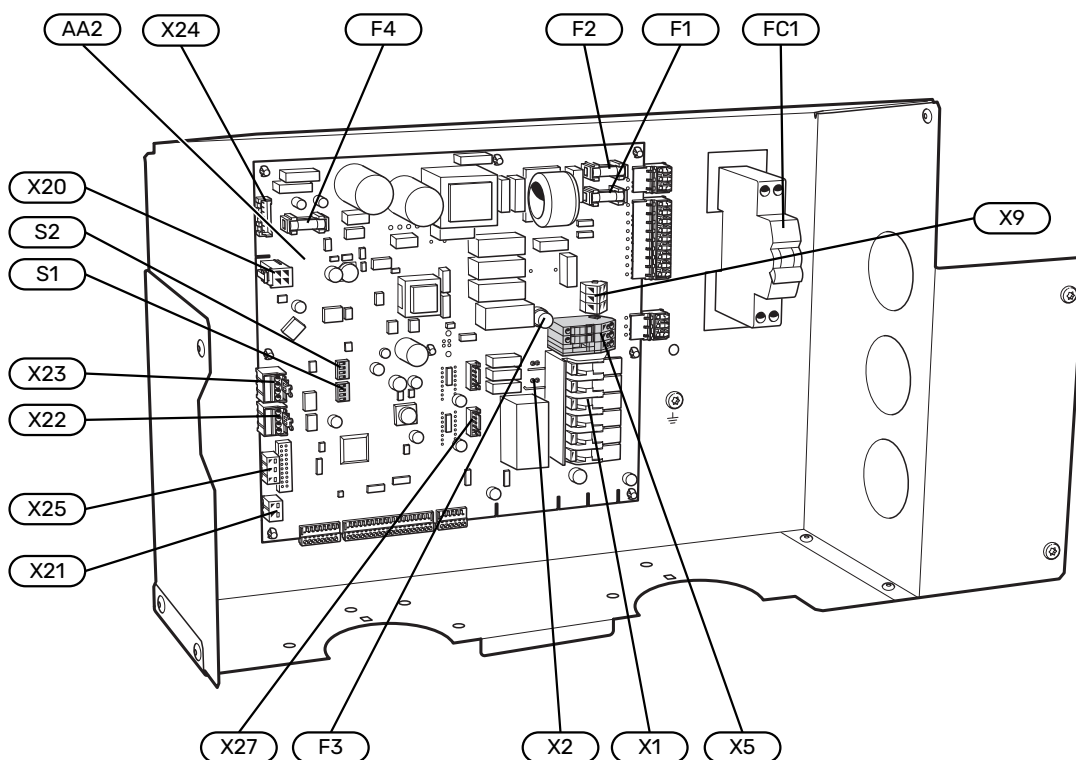
Designations according to standard EN 81346-2.

Distribution boxes

JÄSPI INVERTER NORDIC R-8, -12



JÄSPI INVERTER NORDIC R-16, -20



ELECTRICAL COMPONENTS

AA2	Base card
X1	Terminal block, incoming supply
X2	Terminal block, compressor supply
X5	Terminal block, external control voltage
X9	Terminal block, connection KVR
X20	Terminal block, inverter
X21	Terminal block, Compressor blocking, Tariff
X22	Terminal block, communications
X23	Terminal block, communications
X24	Terminal block, fan
X25	Terminal block, flow meter BF1 ¹
X27	Terminal block, expansion valve QN1
	¹ Included only in JÄSPI Inverter Nordic R-16/-20
F1	Fuse, operating 230V~, 4A
F2	Fuse, operating 230V~, 4A
F3	Fuse for external heating cable, KVR, 250mA
F4	Fuse, fan, 4A
FC1	Miniature circuit-breaker (Replaced with automatic protection (FB1) when installing accessory KVR.)
S1	DIP switch, addressing heat pump during multi operation
S2	DIP switch, different options

Pipe connections

General

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

JÄSPI Inverter Nordic R is not equipped with shut-off valves on the heating medium side, rather these must be installed to facilitate any future servicing.

MINIMUM SYSTEM FLOW DEFROSTING



CAUTION!

An undersized climate system can result in damage to the product and lead to malfunctions.

The dimensions of the pipes between the indoor module and the heat pump should not be less than the recommended pipe diameter. The climate system must be dimensioned individually to provide the recommended system flows.

The installation must be dimensioned to provide the minimum defrosting flow at 100 % circulation pump operation.

Air/water heat pump	Minimum flow during defrosting 100% circulation pump operation (l/s)	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
JÄSPI Inverter Nordic R-8	0.32	25	28
JÄSPI Inverter Nordic R-12			
JÄSPI Inverter Nordic R-16	0.38	32	35
JÄSPI Inverter Nordic R-20	0.48		

WATER VOLUMES

To prevent short operating times, and to enable defrosting, a certain available water volume is required. For the optimum operation of JÄSPI Inverter Nordic R, a minimum available water volume is recommended, see table. This applies separately to heating and cooling systems.

Air/water heat pump	Water volume (litres)
JÄSPI Inverter Nordic R-8, -12	120
JÄSPI Inverter Nordic R-16	160
JÄSPI Inverter Nordic R-20	200

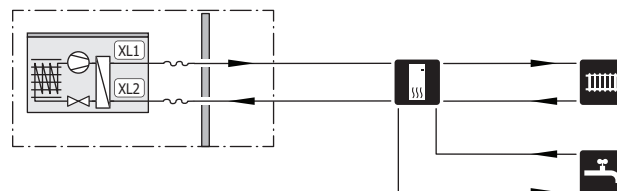


CAUTION!

The pipe installation must be flushed out before the heat pump is connected so debris cannot damage component parts.

SYSTEM DIAGRAM

Principle of operation with indoor module, hot water and climate system.



XL1 Heating medium connection, supply (out from JÄSPI Inverter Nordic R)

XL2 Heating medium connection, return (to JÄSPI Inverter Nordic R)

Symbol key

Symbol	Meaning
	Shut-off valve
	Circulation pump
	Expansion vessel
	Filterball
	Pressure gauge
	Safety valve
	Diverter valve/shunt
	Indoor module
	Control module
	Air/water heat pump
	Heating system
	Domestic hot water
	Water heater/heat pump heater

Pipe coupling heating medium circuit



NOTE!

There is a difference between connection to a control module compared with connection to an indoor module.

See the Installer Manual for the indoor module/control module.

Install as follows:

- expansion vessel
- pressure gauge
- pressure relief valve
- charge pump
- shut-off valve

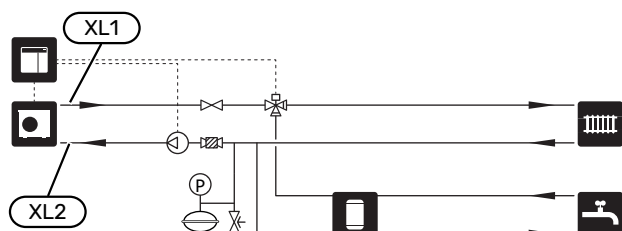
To facilitate any future servicing.

- enclosed filterball (QZ2)

The filterball must be installed indoors on the return line to the heat pump.

- diverter valve.

When connecting to the control module, and if the system has to be able to work with both the climate system and the heat pump heater.

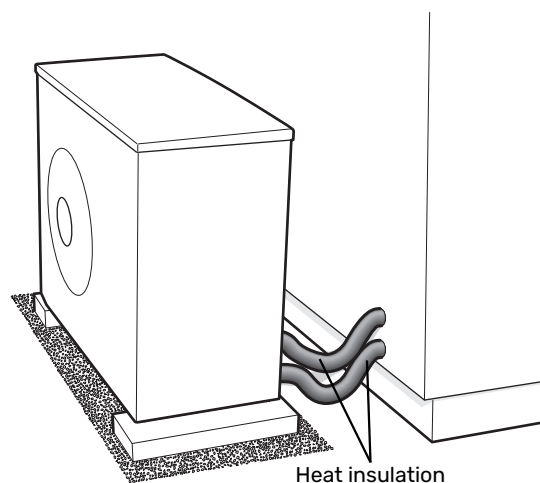


The image shows connection to the control module.

FLEXIBLE PIPE CONNECTION

The supplied flexible hoses act as vibration dampers. The flexible pipes are fitted so an elbow is created, thus acting as vibration damping.

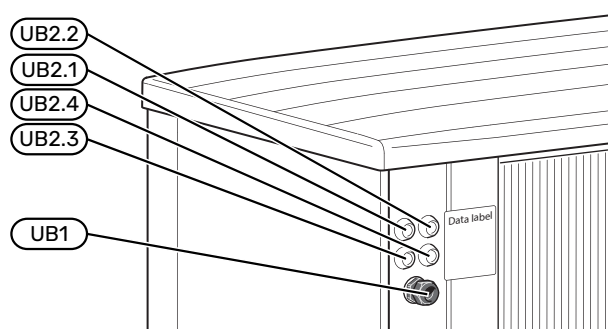
All outdoor pipes must be insulated with at least 19 mm thick pipe insulation.



Electrical connections

General

- Electrical installation and wiring must be carried out in accordance with national provisions.
- Prior to insulation testing the house wiring, disconnect the air/water heat pump installation.
- If a miniature circuit breaker is used, this must have at least triggering characteristic "C". See section "Technical specifications" for fuse size.
- JÄSPI Inverter Nordic R must be fitted with a RCD (residual current device). A separate residual current device is recommended.
- The RCD must have a nominal tripping current of no more than 30 mA.
- JÄSPI Inverter Nordic R must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.
- Use a screened 3-core cable for communication with the indoor module/control module. Max. cable area 0.75 mm².
- To prevent interference, communication cables to external connections must not be laid in the vicinity of high voltage cables.
- Connect the charge pump to the control module. See where the charge pump is to be connected in the Installer Manual for your control module.
- When routing a cable into JÄSPI Inverter Nordic R, the cable grommets (UB1) and (UB2) must be used.



CAUTION!

Electrical installation and any servicing must be carried out under the supervision of a qualified electrician. Turn off the power with the circuit breaker before servicing.



CAUTION!

Check the connections, main voltage and phase voltage before the product is started, to prevent damage to the heat pump electronics.



CAUTION!

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



CAUTION!

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



CAUTION!

Do not start the system before filling up with water. Components in the system could be damaged.

Accessibility, electrical connection

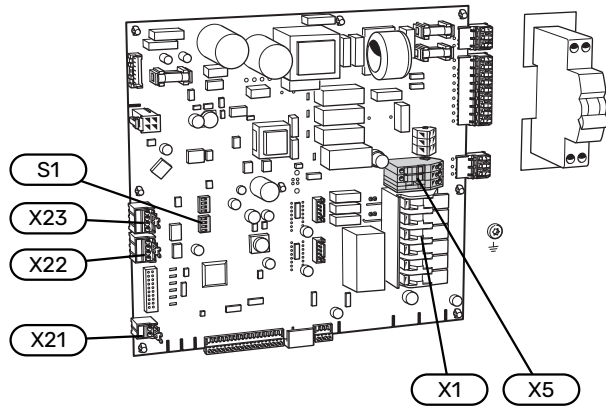
See section "Remove side panel and top panel".

Connections

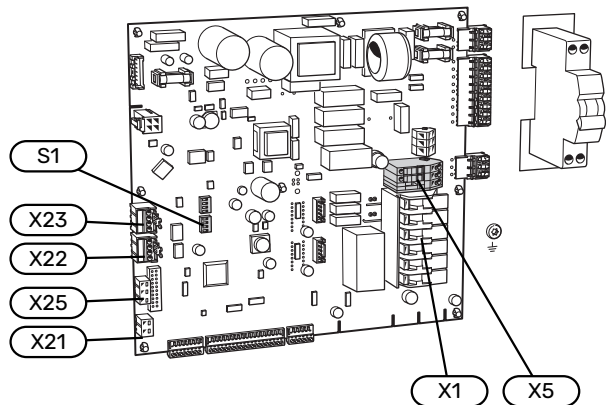
TERMINAL BLOCKS

The following terminal blocks are used on the base board (AA2).

JÄSPI Inverter Nordic R-8, -12



JÄSPI Inverter Nordic R-16, -20

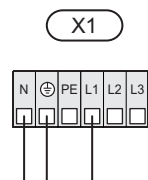


POWER CONNECTION

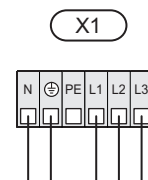
Supply voltage

The enclosed cable (length 1.8 m) for incoming electricity is connected to terminal block X1.

1x230 V



3x400 V



During installation, fit the screwed connection (UB1) on the rear of the heat pump. The part of the screwed connection that tensions the cable must be tightened to a tightening torque greater than 3.5Nm.

External control voltage for the control system

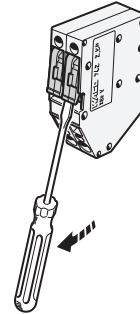
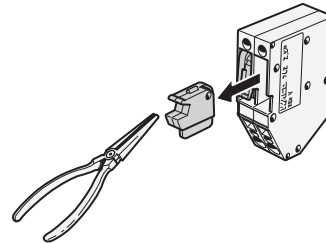
If the control system is to be powered separately from other components in JÄSPI Inverter Nordic R (e.g. for tariff control), a separate operating cable is connected.



CAUTION!

During service, all supply circuits must be disconnected.

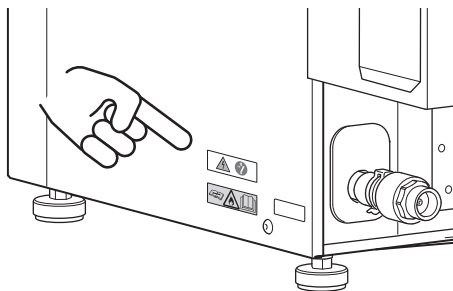
1. Remove the bridges from terminal block AA2-X5.



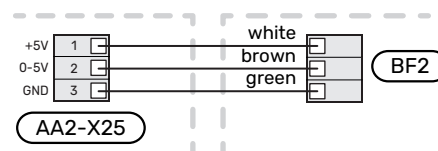
2. Connect control voltage (230V ~ 50Hz) to X5:N, X5:L and X5:PE.

Enclosed labels

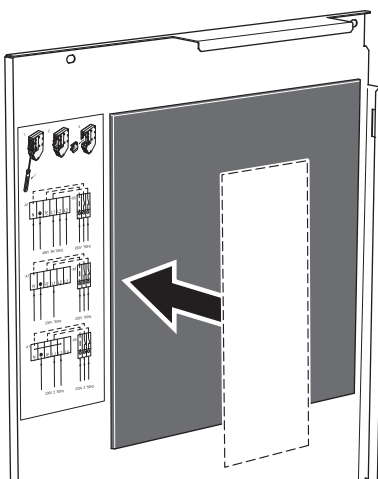
The small label is placed on the outside of the side panel.



'I Inverter Nordic R EMK 300



The large label is placed on the inside of the side panel, next to the insulation.

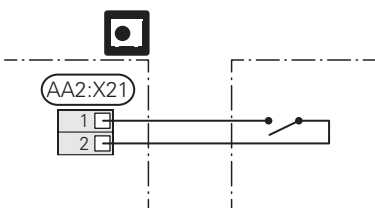


Tariff control

If the voltage to the compressor is lost for a period, "Tariff blocking" must be selected at the same time via the selectable inputs in the indoor module / control module or an external contact must be connected to the air/water heat pump.

The closing contact connects to AA2-X21:1 and X21:2.

External compressor blocking



EXTERNAL CONNECTIONS

Connecting the flow meter in JÄSPI Inverter Nordic R-16/-20

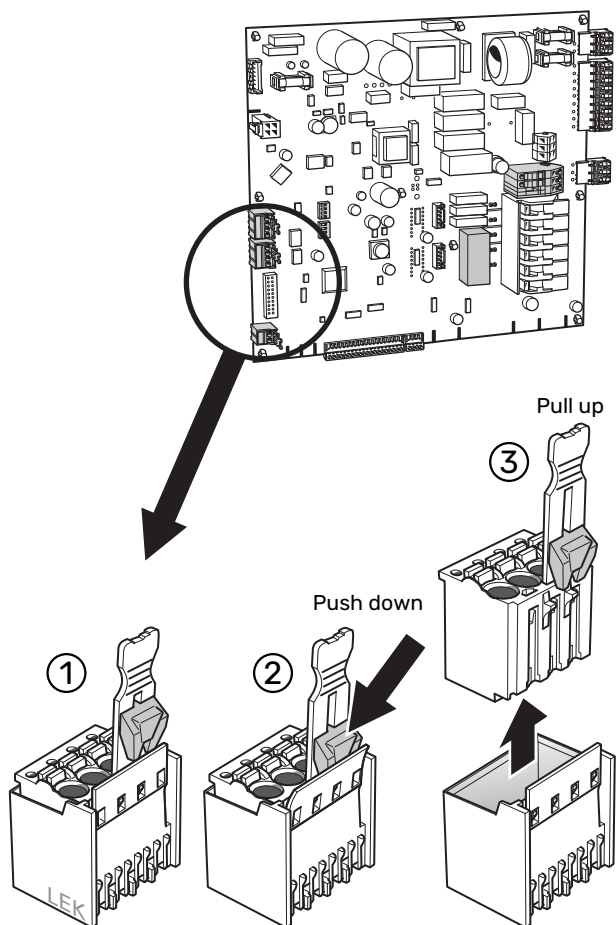
A flow meter (BF1) can be connected indoors to JÄSPI Inverter Nordic R-16/-20² via the base board (AA2-X25:1-3). (White cable is +5V to terminal block 1, brown cable is signal to terminal block 2 and green cable is GND to terminal block 3.)

² Only applies together with the S-series indoor module or control module.

COMMUNICATION

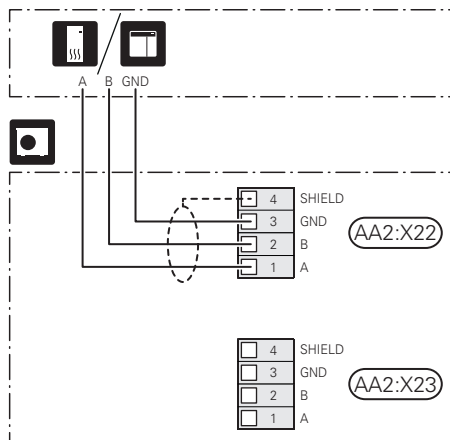
Disconnect the connections in JÄSPI Inverter Nordic R

Remove the connectors (X22, X23) in JÄSPI Inverter Nordic R when connecting communication to an indoor module / control module.



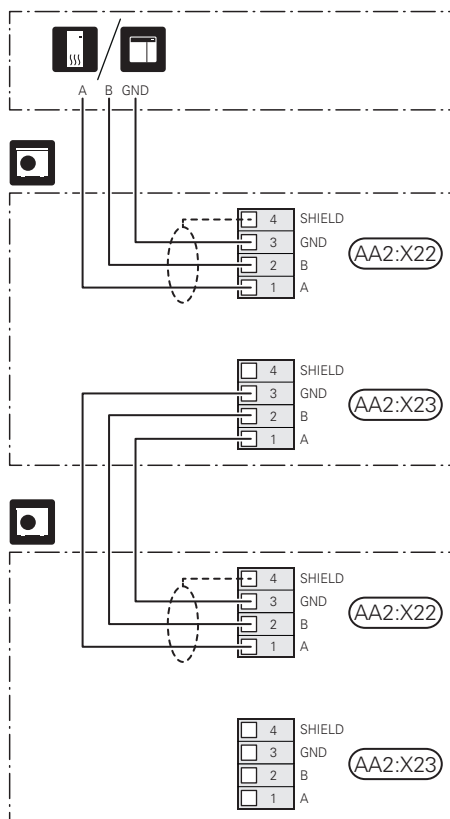
Cable routing, communication

1. Connect the communication cable to the terminal block for communication (AA2-X22:1–3) in JÄSPI Inverter Nordic R.
2. Connect the cable's screen to the terminal block for communication (AA2-X22:4) in JÄSPI Inverter Nordic R.



Cascade connection

1. Connect terminal block (AA2-X23:1–3 with the next heat pump's terminal block (AA2-X22:1–3) for cascade connection.
2. Connect the cable's screen to (AA2-X23:4) in each JÄSPI Inverter Nordic R.



DIP switch

JÄSPI Inverter Nordic R is equipped with a DIP switch (S1) on the base board (AA2).



CAUTION!

Only change the DIP switch when JÄSPI Inverter Nordic R is not powered up.

Cascade connection

In installations with multiple heat pumps, each heat pump must have a unique address, which is set with the DIP switch.

Heat pump	Position (1 / 2 / 3)
1 (EB101)	off / off / off
2 (EB102)	on / off / off
3 (EB103)	off / on / off
4 (EB104)	on / on / off
5 (EB105)	off / off / on
6 (EB106)	on / off / on
7 (EB107)	off / on / on
8 (EB108)	on / on / on

Cooling

JÄSPI Inverter Nordic R can supply cooling with cooling supply down to +7°C. To enable cooling operation, the DIP switch must be set.

Function	Position (4)	Default setting
Permits cooling	on	off

Commissioning and adjusting

Preparations



NOTE!

Check the miniature circuit-breaker (FC1). It could have tripped during transport.

COMPRESSOR HEATER

JÄSPI Inverter Nordic R is equipped with compressor heaters that heat the compressor before start-up and when the compressor is cold.

Compressor heater (EB10) is activated when the heat pump is connected to the supply voltage. The compressor needs to be heated up before starting for the first time. From the time the indoor module/control module is connected and a heating demand arises, it may take a while before the compressor reaches the permitted start value.

Filling and venting

Fill the heating system to the necessary pressure.

The heat pump is vented automatically with the aid of the gas separator (HQ8). The gas separator closes automatically when the valve housing has been vented and filled with liquid.

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 charge pump or radiators, the entire system requires further venting. When the system has stabilised (correct pressure and all air eliminated), the automatic heating control system can be set as required.

Commissioning



CAUTION!

Do not start JÄSPI Inverter Nordic R if there is a risk that the water in the system has frozen.

1. Check that the communication cable between the heat pump and the indoor module/control module is connected.
2. Power-up JÄSPI Inverter Nordic R and the indoor module/control module.
3. Check that the miniature circuit-breaker (FC1) is in the on position.
4. Reinstall the removed panels and cover.
5. After the power to JÄSPI Inverter Nordic R has been switched on, and there is a compressor demand from the indoor module/control module, the compressor starts once it has warmed up.
6. Adjust the charge flow according to size. Also see section "Adjustment, charge flow".
7. Follow the instructions in the start guide in the indoor module's/control module's display.
8. Fill in "Inspection of the installation", in section "Important information".

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

Adjustment, charge flow

For correct function of the heat pump over the entire year, the charge flow must be correctly adjusted.

If an Kaukora indoor module or accessory-controlled charge pump is used for the control module, the control tries to maintain an optimal flow across the heat pump.

If an Kaukora indoor module Jäspi Tehowatti AIR or accessory controlled charge pump is used for the control module Jäspi MCU 40, the control tries to maintain an optimal flow across the heat pump.

Adjustment may be required; above all, for charging a separate heat pump heater. It is therefore recommended to have the option of adjusting the flow across the heat pump heater using a trim valve.

1. Recommendation if there is insufficient hot water and information message "high condenser out" during hot water charging: increase the flow
2. Recommendation if there is insufficient hot water and information message "high condenser in" during hot water charging: reduce the flow

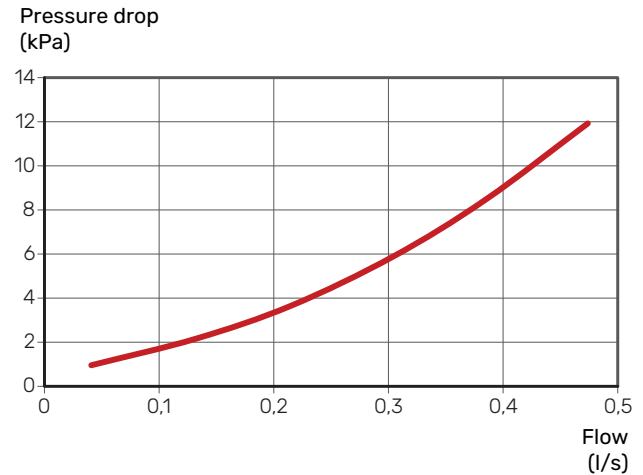
Charge pump

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

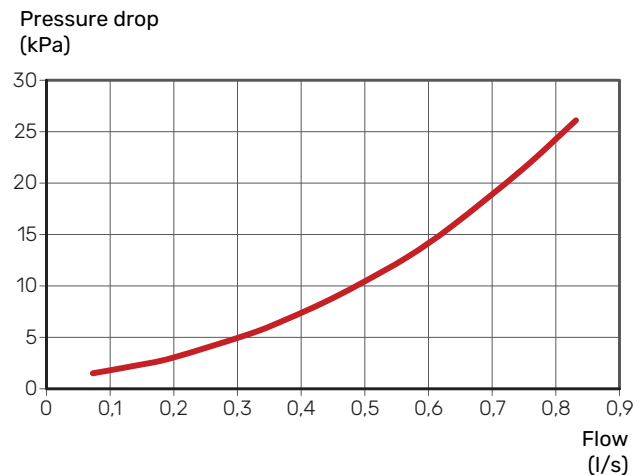
Pressure drop, heating medium side

The diagram shows the pressure drop on the heating medium side, including the gas separator.

JÄSPI Inverter Nordic R-8, -12



JÄSPI Inverter Nordic R-16, -20



Control

General

JÄSPI Inverter Nordic R is equipped with an internal electronic controller that handles all functions necessary for operation of the heat pump, e. g. defrosting, stop at max/min temperature, connection of the compressor heater, and protective functions during operation.

The integrated control shows information via status-LEDs and can be used during servicing.

Under normal operating conditions the home owner does not need to have access to the controller.

JÄSPI Inverter Nordic R communicates with the Kaukora indoor module/control module, which means that all settings and measurement values from JÄSPI Inverter Nordic R are adjusted and read off on the indoor module/control module.



NOTE!

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

Control conditions

CONTROL CONDITIONS DEFROSTING

- If the temperature of the evaporator sensor (BT16) is below the start temperature for the defrosting function, JÄSPI Inverter Nordic R counts the time to "active defrosting" for each minute that the compressor is running, to create a defrosting requirement.
- Time until "active defrosting" is shown in minutes on the indoor module / control module. Defrosting starts when this value is 0 minutes.
- "Passive defrosting" is started, if the compressor requirement has been fulfilled, at the same time as there is a defrosting requirement and the outdoor temperature (BT28) is greater than 4 °C.
- Defrosting occurs actively (with compressor on and fan off) or passively (with compressor off and fan on).
- If the evaporator becomes too cold during operation, a "safety defrost" is started to reduce the amount of ice formation on the evaporator. A safety defrost can lead to defrosting being performed more often than normal, for a limited period of time. If safety defrosting occurs ten times in a row, the evaporator (EP1) on JÄSPI Inverter Nordic R must be checked, which is indicated by an alarm.
- If "de-icing fan" is activated in the indoor module/control module, "de-icing fan" starts at the next "active defrosting". "De-icing fan" removes the build-up of ice on the fan blades and the front fan grille.

Active defrosting:

1. The reversing valve shifts to defrosting.
2. The fan stops and the compressor continues to run.
3. When defrosting is complete, the reversing valve switches back to heating operation. The compressor speed is locked for a short period.
4. The ambient temperature is locked and the high return temperature alarm is blocked for two minutes after defrosting.

Passive defrosting:

1. If there is no compressor demand, passive defrosting can start.
2. The reversing valve does not shift.
3. Fan runs at high speed.
4. If there is a compressor demand, passive defrosting stops and the compressor starts.
5. When passive defrosting is complete, the fan stops.
6. The ambient temperature is locked and the high return temperature alarm is blocked for two minutes after defrosting.

Activating JÄSPI Inverter Nordic R

F-SERIES – INDOOR MODULE / CONTROL MODULE

Settings for JÄSPI Inverter Nordic R can be made via the start guide or directly in the menu system.

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

Start guide

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

Menu system

If you do not make all settings via the "Start guide", or if you need to change any of the settings, you can do this in the menu system.

Menu 5.11.1.1 - heat pump

Here, you make specific settings for the installed heat pump.

Silent mode permitted

Setting range: yes / no

Detect compressor phase

Setting range 1 x 230 V: off/on

Current limit

Setting range: 6 – 32 A

Factory setting: 32 A

blockFreq 1

Setting range: yes / no

blockFreq 2

Setting range: yes / no

Defrosting

Start manual defrosting

Setting range: on/off

Start temperature for defrost function

Setting range: -3 – 3 °C

Factory setting: -3 °C

Cut-out value activation passive defrosting

Setting range: 2 – 10 °C

Factory setting: 4 °C

Defrost more often

Setting range: Yes / No

Silent mode permitted: Here, you set whether silent mode will be activated for the heat pump. Please note that you now have the option to schedule when silent mode will be active.

The function should only be used for limited periods, because JÄSPI Inverter Nordic R possibly may not reach its dimensioned output.

Detect compressor phase: This shows the phase in which the heat pump has been detected. Phase detection normally occurs automatically in connection with start-up of the indoor module/control module. This setting can be changed manually.

Current limitation: Here, you set whether the function for current limitation will be activated for the heat pump. When the function is active, you can limit the value of the maximum current.

BlockFreq 1: Here, you can select a frequency range within which the heat pump is not permitted to work. This function can be used if certain compressor speeds cause disturbing noise in the house.

BlockFreq 2: Here, you can select a frequency range within which the heat pump is not permitted to work.

Defrosting

Here you can change the settings that affect the defrost function.

Start manual defrosting: Here, you can start "active defrosting" manually, if the function needs to be tested for servicing or if necessary. This can be justified together with "fan de-icing".

Start temperature for defrost function: Here, you set the temperature (BT16) at which the defrost function will start. The value must only be changed in consultation with the installer.

Cut-out value activation passive defrosting: Here, you set the temperature (BT28) at which "passive defrosting" will be activated. During passive defrosting, the ice is melted by the energy from the ambient air. The fan is active during passive defrosting. The value must only be changed in consultation with the installer.

Defrost more often: Here, you activate whether defrosting will occur more frequently than normal. This selection can be made if the heat pump receives an alarm due to build-up of ice during operation caused, for example, by snow.

Menu 4.9.7 - tools

Fan de-icing

Setting range: off/on

Continuous fan de-icing

Setting range: off/on

Operate fan during defrosting

Setting range: off/on

This function ensures that any ice on the fan or fan grille is removed.

Fan de-icing: Here, you set whether the "fan de-icing" function will be activated during the next "active defrosting". This can be activated if ice/snow sticks to the fan, grille or fan cone, which may be noticed due to abnormal fan noise from the outdoor unit.

"Fan de-icing" means that the fan, grille and fan cone are heated using hot air from the evaporator (EP1).

Continuous fan de-icing: There is the option to set recurring de-icing. In this case, every tenth defrosting will be "Fan de-icing". (This can increase annual energy consumption.)

Operate fan during defrosting: Activate "Operate fan during defrosting" if you experience problems with the fan in connection with defrosting. The fan will then never stop during the defrosting process. For JÄSPI Inverter Nordic R-8, -12, this will apply when the ambient temperature is above -10 °C and for JÄSPI Inverter Nordic R-16, -20 when the ambient temperature is above -25 °C. (This can increase annual energy consumption.)

Service

Service actions



CAUTION!

Servicing should only be carried out by persons with the necessary expertise.

When replacing components on JÄSPI Inverter Nordic R only replacement parts from Kaukora may be used.

DRAINING THE CONDENSER

In the event of a prolonged power failure or similar, for example, the condenser in JÄSPI Inverter Nordic R may need to be drained of water.



CAUTION!

There may be some hot water, risk of scalding.

1. Close the shut-off valves.
2. Release the pressure using the vent valve (QM20) on the automatic gas separator (HQ8).
3. Release the clip and pull out the non-return valve (RM1.2) on the heating medium connection, return (to JÄSPI Inverter Nordic R) (XL2).

ACTUATING THE SAFETY VALVE (FL2)

The safety valve (FL2) must be actuated regularly, to remove dirt and to check that it is not blocked.

Remember to also check that the vent valve (QM20) is working.

TEMPERATURE SENSOR DATA

Return line (BT3), condenser supply (BT12), liquid line (BT15)

Temperature (°C)	Resistance (kOhm)	Voltage (VDC)
-10	56.20	3.047
0	33.02	2.889
10	20.02	2.673
20	12.51	2.399
30	8.045	2.083
40	5.306	1.752
50	3.583	1.426
60	2.467	1.136
70	1.739	0.891
80	1.246	0.691

Discharge sensor (BT14)

Temperature (°C)	Resistance (kOhm)	Voltage (V)
40	118.7	4.81
45	96.13	4.77
50	78.30	4.72
55	64.11	4.66
60	52.76	4.59
65	43.64	4.51
70	36.26	4.43
75	30.27	4.33
80	25.38	4.22
85	21.37	4.10
90	18.07	3.97
95	15.33	3.83
100	13.06	3.68
105	11.17	3.52
110	9.59	3.36
115	8.26	3.19
120	7.13	3.01

Evaporator sensor (BT16), ambient sensor (BT28), suction gas sensor (BT17) and suction gas, evaporator (BT84)

Temperature (°C)	Resistance (kOhm)	Voltage (VDC)
-40	43.34	4.51
-30	25.17	4.21
-20	15.13	3.82
-10	9.392	3.33
0	6.000	2.80
10	3.935	2.28
20	2.644	1.80
30	1.817	1.39
40	1.274	1.07

Disturbances in comfort

In most cases, the indoor module / control module notes a malfunction and indicates this with alarms and presents action instructions in the display.

Troubleshooting



CAUTION!

In the event of action to rectify malfunctions that require work within screwed hatches, the incoming supply electricity must be isolated at the safety switch by or under the supervision of a qualified electrician.



NOTE!

Alarms are acknowledged on the indoor module / control module (JÄSPI Tehowatti Air / JÄSPI MCU40).

If the operational interference is not shown in the display the following tips can be used:

BASIC ACTIONS

Start by checking the following:

- All supply cables to the heat pump are connected.
- Group and main fuses of the accommodation.
- The property's earth circuit breaker.
- The heat pump's RCD.
- The heat pump's fuse / automatic protection. (FC1 / FB1, FB1 only if KVR is installed.)
- That the air flow to JÄSPI Inverter Nordic R is not blocked by foreign objects.
- That JÄSPI Inverter Nordic R does not have any external damage.

JÄSPI INVERTER NORDIC R DOES NOT START

- There is no demand.
 - The indoor module/control module does not call on heating, cooling or hot water.
- Compressor blocked due to the temperature conditions.
 - Wait until the temperature is within the product's working range.
- Minimum time between compressor starts has not been reached.
 - Wait for at least 30 minutes and then check if the compressor has started.
- Alarm tripped.
 - Follow the display instructions.

JÄSPI INVERTER NORDIC R NOT COMMUNICATING

- Check that JÄSPI Inverter Nordic R is correctly installed in the indoor module (JÄSPI Tehowatti Air) or the control module (JÄSPI MCU40).
- Check that the communication cable is correctly connected and working.

LOW HOT WATER TEMPERATURE OR A LACK OF HOT WATER

This part of the troubleshooting chapter only applies if the heat pump is docked to the heat pump heater or indoor module.

- Large hot water consumption.
 - Wait until the hot water has heated up.
- Incorrect hot water settings in indoor module/control module.
 - See the Installer Manual for the indoor module/control module.
- Clogged filterball.
 - Switch off the system. Check and clean the filterball.

LOW ROOM TEMPERATURE

- Closed thermostats in several rooms.
 - Set the thermostats to max in as many rooms as possible.
- Incorrect settings in the indoor module/control module.
 - See the manual for the indoor module / control module (JÄSPI Tehowatti Air / JÄSPI MCU40).
- Air-filled radiators/underfloor heating coils.
 - Bleed the system.

HIGH ROOM TEMPERATURE

- Incorrect settings in the indoor module/control module.
 - See the Installer Manual for the indoor module/control module.

ICE BUILD-UP IN THE FAN, GRILLE AND/OR FAN CONE

- Activate "fan de-icing" in the indoor module/control module. Alternatively "continuous fan de-icing" if the problem recurs.
- Check that the air flow across the evaporator is correct.

LARGE AMOUNT OF WATER BELOW JÄSPI INVERTER NORDIC R

- The accessory KVR is required.
- If KVR is installed, check that the water drainage can flow freely.

ACTIVE DEFROSTING IS TERMINATED

There are several possible reasons for an active defrosting to end:

- If the temperature of the evaporator sensor has reached its stop value (normal stop).
- When defrosting has gone on for longer than 15 minutes. This may be due to too little energy in the heat source, too strong a wind effect on the evaporator and/or that the sensor on the evaporator is not correct and therefore displays too low a temperature (at cold outdoor air).
- When the temperature on the return line sensor, BT3, falls below 10 °C.
- If the temperature of the evaporator (BP8) falls below its lowest permitted value. After failing to defrost ten times, JÄSPI Inverter Nordic R must be checked. This is indicated by an alarm.
- The flow is less than the min. dimensioned flow at 100 % pump speed.

Alarm list

Alarm F-series	Alarms S-series	Alarm text on the display	Description existing alarm	May be due to
156 (80)	212	Low pressure alarm, cooling operation	5 repeated alarms for low low-pressure within 4 hours.	Poor flow. Significant wind effect.
224 (182)	233	Fan alarm in outd air heat pump	5 unsuccessful start attempt.	Fan blocked or not connected.
225 (8)	234	Flow fault	Return is hotter than flow.	Connection, supply line return line switched around,
228 (2)	236	Defrosting fault	10 failed consecutive defrostings.	System temperature and/or flow too low. Insufficient available system volume. Significant wind effect.
229 (4)	237	Short compressor oper time	Operation is stopped from the indoor section after less than 5 minutes.	Poor flow, poor heat transfer. Incorrect settings for heating and/or hot water.
230 (78)	238	High discharge	3 repeated alarms for high discharge within 4 hours.	Disruption in the refrigerant circuit. Lack of refrigerant.
232 (76)	240	Low evaporation	5 repeated alarms for low evaporation temperature within 4 hours.	Lack of refrigerant. Blocked expansion valve. Significant wind effect.
264 (203)	254	Communication fault to inverter	Alarm 203 from heat pump for 20 seconds.	Poor connection between PCB and inverter. Inverter unpowered or broken.
298 (92)	494	Preheat. failed, long run time	The inverter has tried to heat up the compressor, but has failed.	Defective inverter. Discharge sensor (BT14) has come loose from its mount.
300 (94)	495	Sensor BT14 or BP9 loose or defective	Sensor BT14 or BP9 has come loose or is otherwise defective.	The discharge sensor, BT14, or high pressure sensor, BP9, has come loose and is not giving correct measurement values.
341 (6)	291	Recurring safety defrosts	10 repeated defrostings according to the protection conditions.	Poor airflow, e.g. because of leaves, snow or ice. Lack of refrigerant.
344 (72)	294	Recurring low pressure	5 repeated low pressure alarm within 4 hours.	Lack of refrigerant. Blocked expansion valve. Disruption in the refrigerant circuit.
346 (74)	295	Recurring high pressure	5 repeated high pressure alarm within 4 hours.	Clogged particle filter, air or stoppage in the heating medium flow. Poor system pressure.
400 (207) 400 (209) 400 (211) 400 (213)	314	Undefined fault	Initiation fault, inverter. The inverter is not compatible Configuration file missing. Charge error configuration.	The inverter is not compatible
425 (108)	322	Press. switch or temp. alarm	2 repeated LP/HP/FQ alarms within 2.5 hours.	Poor heating medium flow. Lack of refrigerant. For FQ14: High temperature compressor peak. JÄSPI Inverter Nordic R-8, -12: 120 °C For FQ14.1: High temperature compressor peak. JÄSPI Inverter Nordic R-16, -20: 130 °C
427 (110)	323	Safety stop, inverter	Temporary fault in inverter, 2 times within 60 minutes.	Disruption in supply voltage.
429 (112)	324	Safety stop, inverter	Temporary fault in inverter, 3 times within 2 hours.	Disruption in supply voltage.

Alarm F-series	Alarms S-series	Alarm text on the display	Description existing alarm	May be due to
437 (120)	328	Mains disturbance	Temporary fault in inverter, 3 times within 2 hours or continuously for 1 hour.	Disruption in supply voltage. Incorrect connection in the inverter's terminal block X1.
439 (122)	329	Overheated inverter	The inverter has temporarily reached max working temperature, due to poor cooling 3 times within 2 hours or continuously for 1 hour.	Poor cooling of inverter. Defective inverter.
441 (124)	330	Safety stop, inverter	Current to inverter too high, 3 times within 2 hours or continuously for 1 hour.	Too high current to inverter. Low supply voltage.
443 (126)	331	Overheated inverter	The inverter has temporarily reached max working temperature, due to poor cooling 3 times within 2 hours or continuously for 1 hour.	Poor cooling of inverter. Defective inverter.
447 (130)	333	Phase drop	Compressor phase is missing, 3 times within 2 hours or continuously for 1 minute.	Disruption in supply voltage. Incorrectly connected compressor cable.
449 (132)	334	Failed compressor start	Compressor does not start when required, 3 times within 2 hours.	Defective inverter. Defective compressor.
453 (136)	336	High current load, compr.	The output current from the inverter to the compressor has been temporarily too high 3 times within 2 hours or continuously for 1 hour.	Disruption in supply voltage. Poor heating medium flow. Defective compressor.
455 (138)	337	High power load, compr.	The power output from the inverter has been too high 3 times within 2 hours or continuously for 1 hour.	Disruption in supply voltage. Poor heating medium flow. Defective compressor.
501 (184)	353	Failed start, no press. diff	The pressure difference between BP9 and BP8 has been too low at compressor start 3 times within 30 minutes.	Fault in pressure sensor BP8, BP9. The compressor does not compress the refrigerant sufficiently. Compressor breakdown.
503 (186)	354	Compressor speed too low	Compressor speed below lowest permitted speed.	The inverter's safety function reduces the speed outside of the compressor's working range.
523	418	Low defrosting flow	The flow is low. Check particle filter and pump.	Clogged particle filter. Defective circulation pump (charge pump). The pressure drop in the climate system is too large.
589 (216)	437	Incorrect PCB in heat pump.	The heat pump has the wrong base board.	The base board has been replaced with a base board that was not intended for this product.
740 (56)	541	Sens flt BT84 outd air ht pump	Sensor fault BT84.	Open-circuit or short-circuit on sensor input.
742 (52)	539	Sens flt BP9 outd air ht pump	Sensor fault BP9.	Open-circuit or short-circuit on sensor input.
744 (50)	538	Sens flt BP8 outd air ht pump	Sensor fault BP8.	Open-circuit or short-circuit on sensor input.
746 (46)	536	Sens flt BT28 outd air ht pump	Sensor fault BT28	Open-circuit or short-circuit on sensor input.
748 (44)	535	Sens flt BT17 outd air ht pump	Sensor fault BT17.	Open-circuit or short-circuit on sensor input.
750 (34)	530	Sens flt BT3 outd air ht pump	Sensor fault BT3.	Open-circuit or short-circuit on sensor input.
752 (42)	534	Sens flt BT16 outd air ht pump	Sensor fault BT16.	Open-circuit or short-circuit on sensor input.
754 (40)	533	Sens flt BT15 outd air ht pump	Sensor fault BT15.	Open-circuit or short-circuit on sensor input.
756 (38)	532	Sens flt BT14 outd air ht pump	Sensor fault BT14.	Open-circuit or short-circuit on sensor input.
758 (36)	531	Sens flt BT12 outd air ht pump	Sensor fault BT12.	Open-circuit or short-circuit on sensor input.

Alarm F-series	Alarms S-series	Alarm text on the display	Description existing alarm	May be due to
762 (90)	617	Temperature protection compressor activated	2 repeated FQ alarms within 2.5 hours.	Poor heating medium flow. Lack of refrigerant. JÄSPI Inverter Nordic R-16, -20: FQ14.1, High temperature compressor peak, 130 °C. FQ14.2, High temperature compressor intake, 75 °C.
765 (88)	616	Persistent high pressure switch alarm.	2 repeated HP alarms within 2.5 hours.	Poor heating medium flow. Lack of refrigerant.
767 (82)	615	Low pressure switch tripped	2 repeated LP alarms within 2.5 hours.	Poor heating medium flow. Lack of refrigerant.

Accessories

Detailed information about the accessories and complete accessories list available at kaukora.fi.

CONDENSATION WATER PIPE KVR

Condensation water pipe with heating cable.

KVR 11-10

1 metres
Part no. 067 823

KVR 11-30

3 metres
Part no. 067 824

KVR 11-60

6 metres
Part no. 067 825

HEAT PUMP WATER HEATER

JÄSPI Buffer 100

LVI Code 505 85 28

JÄSPI Buffer 270

LVI Code 536 01 56

JÄSPI Buffer 200

LVI Code 536 01 19

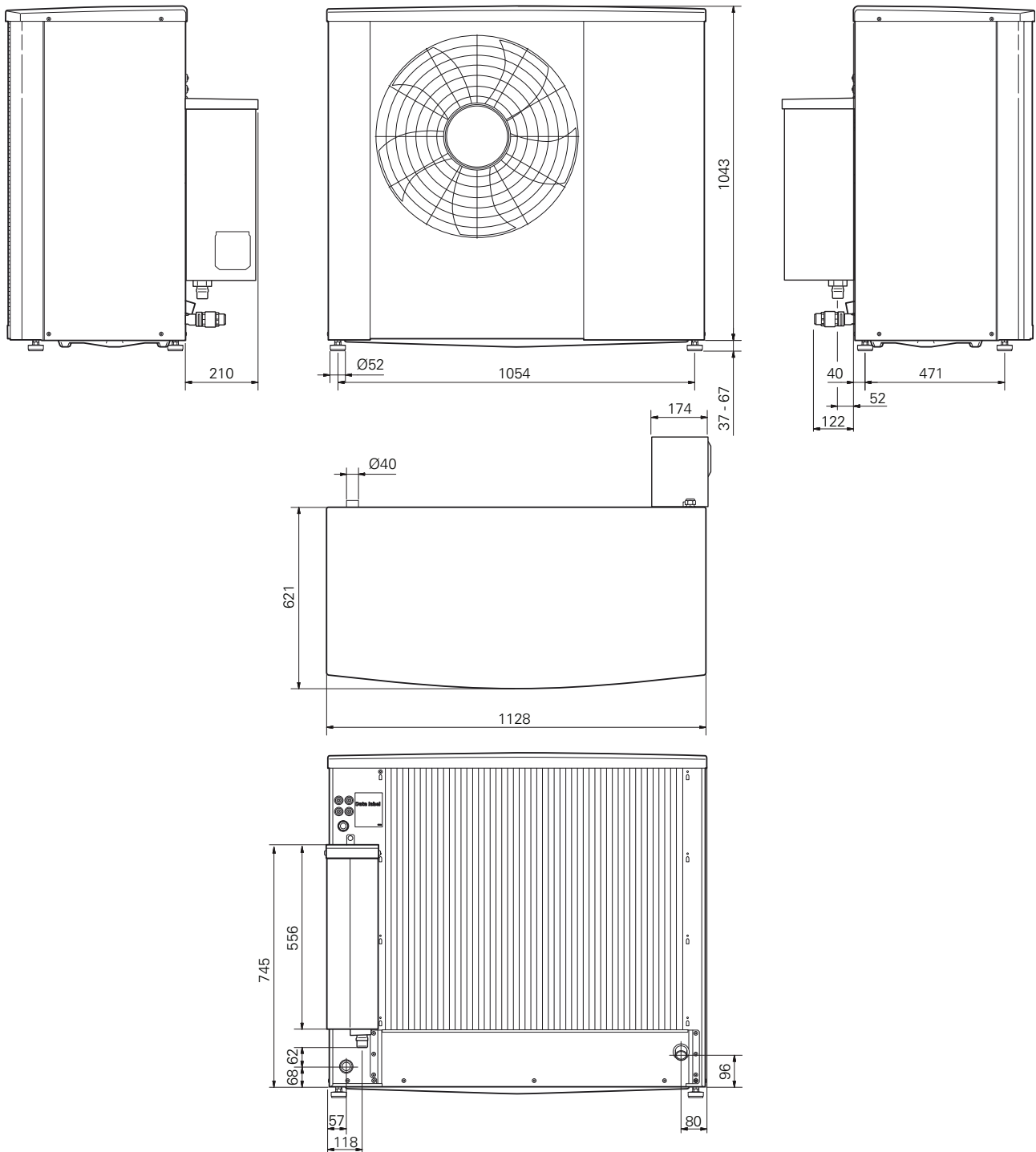
JÄSPI Buffer 500

LVI Code 536 01 57

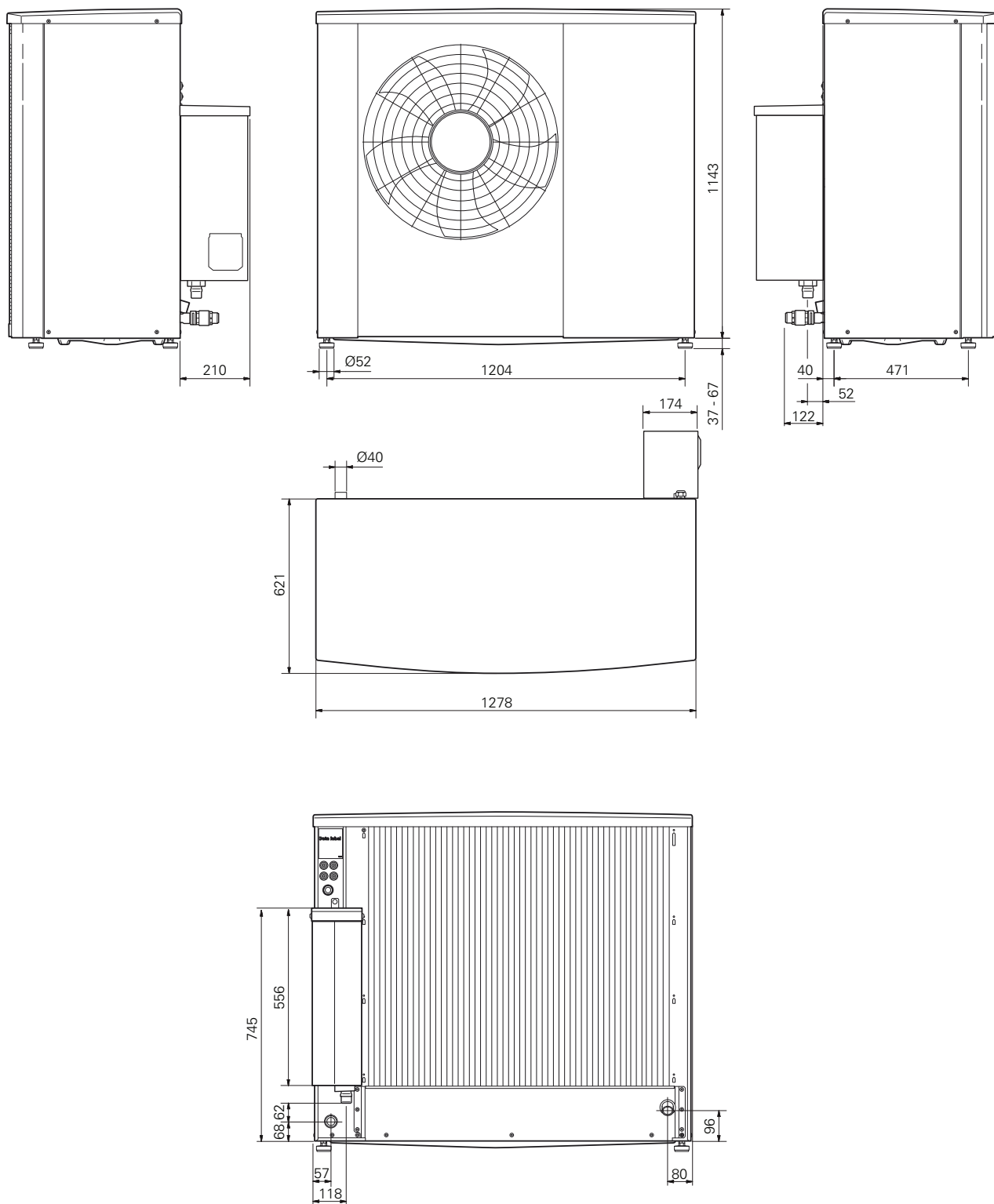
Technical data

Dimensions

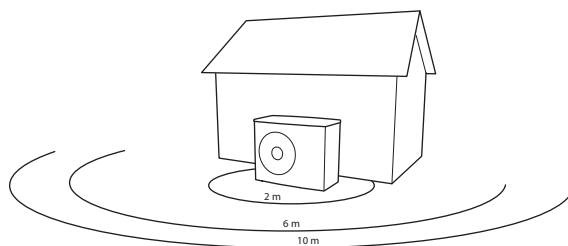
JÄSPI INVERTER NORDIC R-8, -12



JÄSPI INVERTER NORDIC R-16, -20



Sound levels



JÄSPI Inverter Nordic R is usually placed next to a house wall, which gives a directed sound distribution that has to be taken into consideration. Accordingly, when setting up, you should always attempt to select 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.

		Sound power ¹	Sound pressure at distance (m) ²									
			1	2	3	4	5	6	7	8	9	10
JÄSPI Inverter Nordic R-8	Nominal sound value	49	44.0	38.0	34.5	32.0	30.0	28.5	27.0	26.0	25.0	24.0
	Max. sound value	55	50.0	44.0	40.5	38.0	36.0	34.5	33.0	32.0	31.0	30.0
	Max. sound value, silent mode	50	45.0	39.0	35.5	33.0	31.0	29.5	28.0	27.0	26.0	25.0
JÄSPI Inverter Nordic R-12	Nominal sound value	49	44.0	38.0	34.5	32.0	30.0	28.5	27.0	26.0	25.0	24.0
	Max. sound value	59	54.0	48.0	44.5	42.0	40.0	38.5	37.0	36.0	35.0	34.0
	Max. sound value, silent mode	54	49.0	43.0	39.5	37.0	35.0	33.5	32.0	31.0	30.0	29.0
JÄSPI Inverter Nordic R-16	Nominal sound value	55	50.0	44.0	40.5	38.0	36.0	34.5	33.0	32.0	31.0	30.0
	Max. sound value	60	55.0	49.0	45.5	43.0	41.0	39.5	38.0	37.0	36.0	35.0
	Max. sound value, silent mode	54	49.0	43.0	39.5	37.0	35.0	33.5	32.0	31.0	30.0	29.0
JÄSPI Inverter Nordic R-20	Nominal sound value	55	50.0	44.0	40.5	38.0	36.0	34.5	33.0	32.0	31.0	30.0
	Max. sound value	63	58.0	52.0	48.5	46.0	44.0	42.5	41.0	40.0	39.0	38.0
	Max. sound value, silent mode	55	50.0	44.0	40.5	38.0	36.0	34.5	33.0	32.0	31.0	30.0

¹ Sound power level, $L_W(A)$, according to EN12102

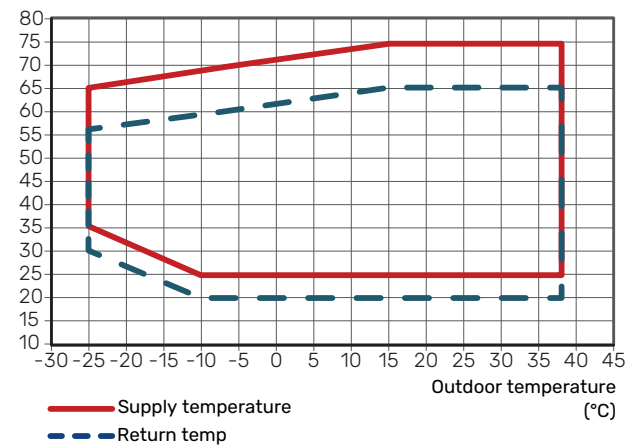
² Sound pressure calculated according to directivity factor $Q=4$

Technical specifications

WORKING RANGE, HEATING

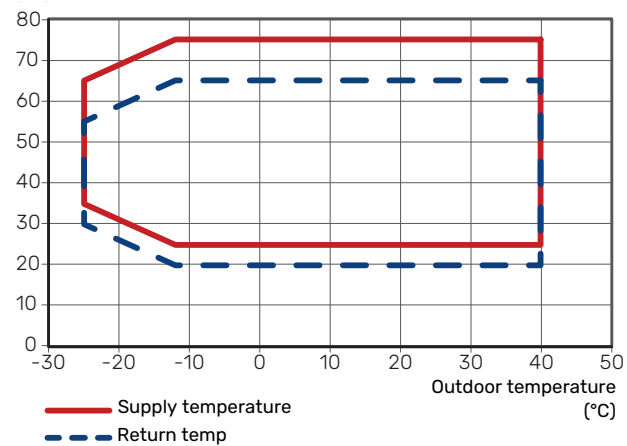
JÄSPI Inverter Nordic R-8, -12

Supply temperature
(°C)



JÄSPI Inverter Nordic R-16, -20

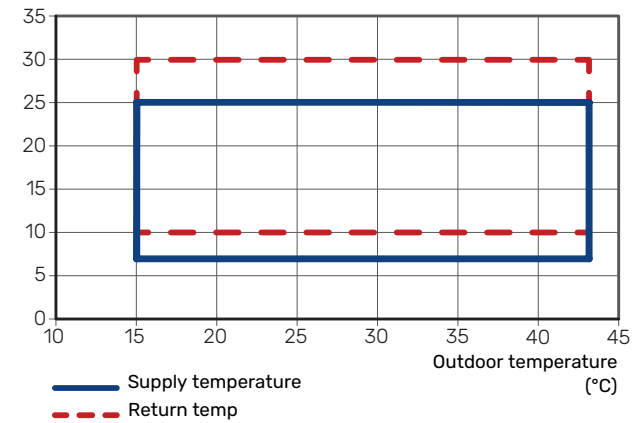
Supply temperature
(°C)



WORKING RANGE, COOLING

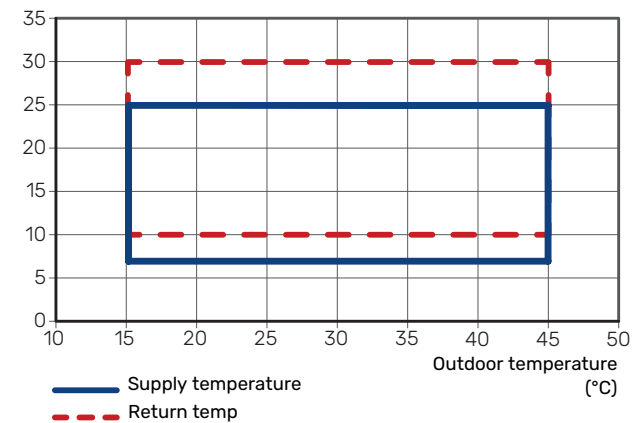
JÄSPI Inverter Nordic R-8, -12

Supply temperature
(°C)



JÄSPI Inverter Nordic R-16, -20

Supply temperature
(°C)



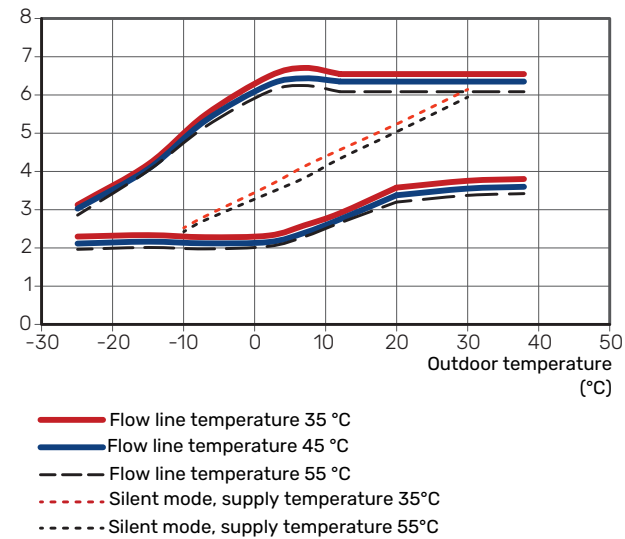
During shorter time it is allowed to have lower working temperatures on the water side, e.g. during start up.

POWER DURING HEATING OPERATION

Maximum and minimum capacity during continuous operation.
Defrosting is not included.

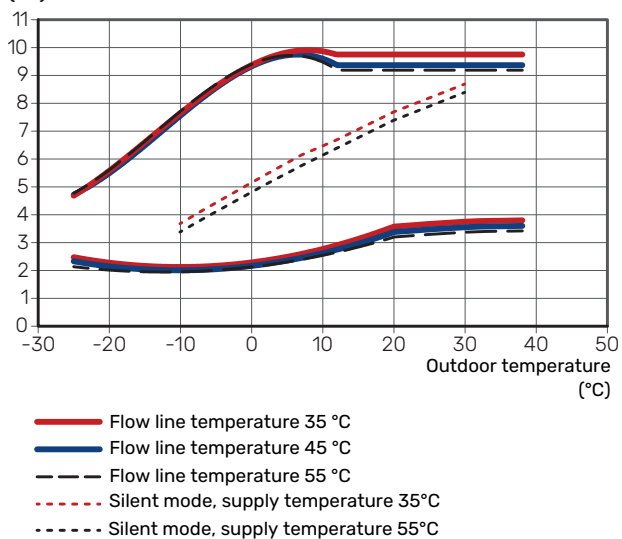
JÄSPI Inverter Nordic R-8

Heating output
(kW)



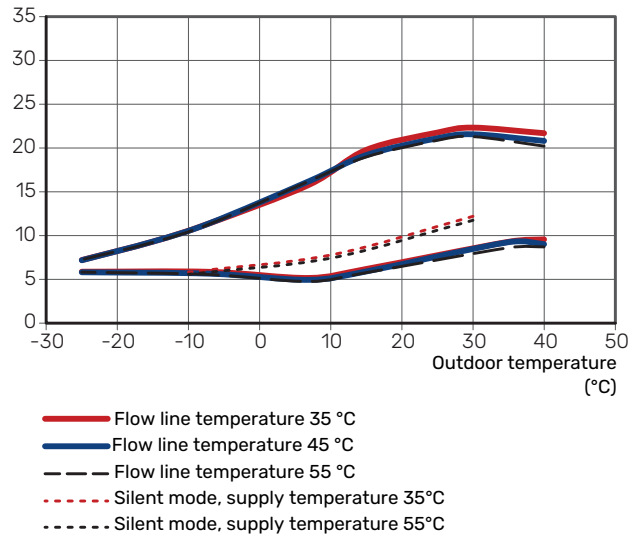
JÄSPI Inverter Nordic R-12

Heating output
(kW)



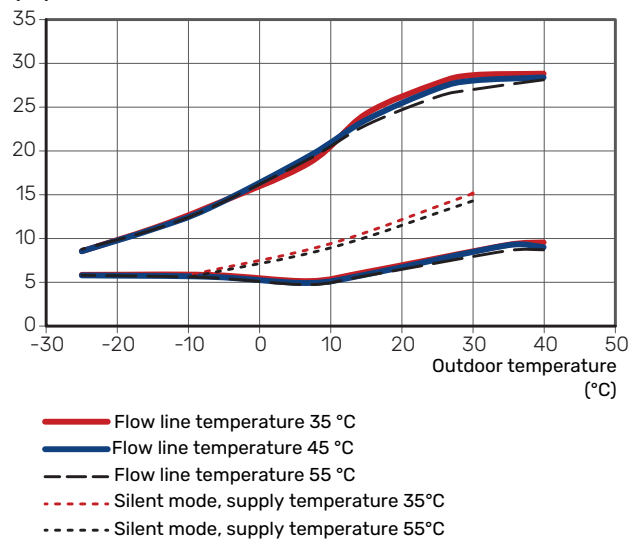
JÄSPI Inverter Nordic R-16

Heating output
(kW)



JÄSPI Inverter Nordic R-20

Heating output
(kW)

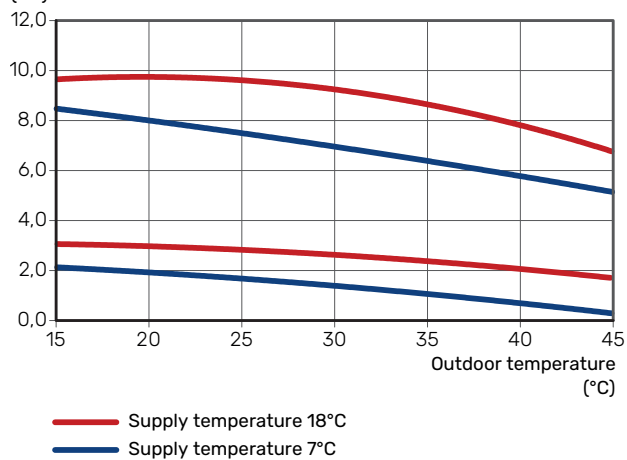


POWER DURING COOLING OPERATION

Maximum and minimum capacity during continuous operation.

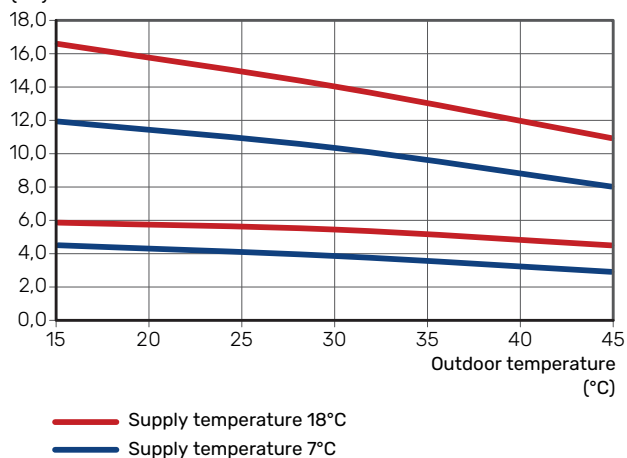
JÄSPI Inverter Nordic R-8, -12

Cooling output
(kW)



JÄSPI Inverter Nordic R-16, -20

Cooling output
(kW)



JÄSPI Inverter Nordic R		8
Voltage		1 x 230 V
Output data according to EN 14 511, partial load ¹		
Heating	-7 / 35 °C	4.72 / 1.72 / 2.74
Capacity / power input / COP (kW/kW/-) at nominal flow	2 / 35 °C	3.20 / 0.72 / 4.44
Outdoor temp: / Supply temp.	2 / 45 °C	2.95 / 0.87 / 3.39
	7 / 35 °C	3.15 / 0.61 / 5.16
	7 / 45 °C	2.97 / 0.76 / 3.90
Cooling	35 / 7 °C	6.69 / 2.41 / 2.77
Capacity / power input / EER (kW/kW/-) at maximum flow	35 / 18 °C	8.68 / 2.60 / 3.34
Outdoor temp: / Supply temp.		
Maximum capacity		
Maximum capacity, heating, at A7W35 without defrosting	kW	6.70
Maximum capacity, heating, at A2W55 with / without defrosting	kW	5.22 / 6.79
Maximum capacity, heating, at A-7W35 without defrosting	kW	5.52
SCOP according to EN 14825		
Nominal heat output (P _{designh}) average climate 35 °C / 55 °C (Europe)	kW	5.33 / 5.30
Nominal heat output (P _{designh}) cold climate 35 °C / 55 °C	kW	5.40 / 5.20
Nominal heat output (P _{designh}) warm climate 35 °C / 55 °C	kW	5.50 / 5.20
SCOP average climate, 35 °C / 55 °C (Europe)		5.00 / 3.70
SCOP cold climate, 35 °C / 55 °C		4.10 / 3.20
SCOP warm climate, 35 °C / 55 °C		6.30 / 4.50
Energy rating, average climate ²		
The product's room heating efficiency class 35 °C / 55 °C ³		A+++ / A++
The system's room heating efficiency class 35 °C / 55 °C ⁴		A+++ / A+++
Electrical data		
Rated voltage		230 V ~ 50 Hz
Rated current, heat pump	A _{rms}	13
Max. power, fan	W	30
Fuse	A _{rms}	16
Enclosure class		IP24
Residual current device (RCD), type		F or B
Refrigerant circuit		
Type of refrigerant		R290
GWP refrigerant		0.02
Filling amount	kg	0.8
Type of compressor		Rotary compressor
CO ₂ -equivalent (The cooling circuit is hermetically sealed.)	kg	0.016
Cut-out value pressure switch HP (BP1)	MPa (bar)	3.15 (31.5)
Difference pressostat HP	MPa (bar)	0.7 (7.0)
Cut-out value pressure switch LP (BP2)	MPa (bar)	0.03 (0.3)
Difference pressostat LP	MPa (bar)	0.07 (0.7)
Airflow		
Max airflow	m ³ /h	2,400
Working area		
Min./max. air temperature, heating	°C	-25 / 38
Min./max. air temperature, cooling	°C	15 / 43
Defrosting system		Reverse cycle
Heating medium circuit		
Max system pressure heating medium	MPa (bar)	0.45 (4.5)
Cut-off pressure, heating medium	MPa (bar)	0.25 (2.5)
Recommended flow interval, heating operation	l/s	0.08 – 0.32
Min. design flow, defrosting (100% pump speed)	l/s	0.32
Min/max supply temperature for heating medium (HM) during continuous operation	°C	25 / 75
Connection heating medium JÄSPI Inverter Nordic R		G1" external thread
Connection heating medium flex pipe		G1" external thread
Min. recommended pipe dimension (system)	DN (mm)	25 (28)
Dimensions and weight		
Width	mm	1,128
Depth	mm	831

JÄSPI Inverter Nordic R		8
Height	mm	1,080
Weight	kg	163
Miscellaneous		
Part no.		064 364

- ¹ Power statements including defrosting according to EN 14511 at heating medium supply corresponding to DT=5 K at 7 / 45.
- ² 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.
- ³ Scale for the product's efficiency class room heating: A+++ to D. Control module model SMO S.
- ⁴ Scale for the system's efficiency class room heating: A+++ to G. Reported efficiency for the system takes the product's temperature regulator into account. Control module model SMO S.

JÄSPI Inverter Nordic R		8	12	16	20
Voltage		3 x 400 V	3 x 400 V	3 x 400 V	3 x 400 V
Output data according to EN 14 511, partial load ¹					
Heating	-7 / 35 °C	4.72 / 1.72 / 2.74	7.23 / 2.73 / 2.65	10.31 / 3.72 / 2.77	12.03 / 4.56 / 2.64
Capacity / power input / COP (kW/kW/-) at nominal flow Outdoor temp: / Supply temp.	2 / 35 °C	3.20 / 0.72 / 4.44	3.67 / 0.85 / 4.32	6.58 / 1.41 / 4.66	7.38 / 1.59 / 4.63
	2 / 45 °C	2.95 / 0.87 / 3.39	3.46 / 1.02 / 3.40	6.65 / 1.81 / 3.68	7.44 / 2.02 / 3.67
	7 / 35 °C	3.15 / 0.61 / 5.16	3.67 / 0.70 / 5.24	5.10 / 0.92 / 5.55	5.10 / 0.92 / 5.55
	7 / 45 °C	2.97 / 0.76 / 3.90	3.35 / 0.85 / 3.94	4.85 / 1.18 / 4.12	4.85 / 1.18 / 4.12
Cooling	35 / 7 °C	6.69 / 2.41 / 2.77	6.69 / 2.41 / 2.77	9.74 / 3.16 / 3.08	9.74 / 3.16 / 3.08
Capacity / power input / EER (kW/kW/-) at maximum flow Outdoor temp: / Supply temp.	35 / 18 °C	8.68 / 2.60 / 3.34	8.68 / 2.60 / 3.34	13.62 / 3.46 / 3.93	13.62 / 3.46 / 3.93
Maximum capacity					
Maximum capacity, heating, at A7W35 without defrosting	kW	6.70	9.90	15.80	18.77
Maximum capacity, heating, at A2W55 with / without defrosting	kW	5.22 / 6.79	7.54 / 9.63	12.42 / 14.44	13.89 / 16.48
Maximum capacity, heating, at A-7W35 without defrosting	kW	5.52	8.34	11.42	13.64
SCOP according to EN 14825					
Nominal heat output (P _{designh}) average climate 35 °C / 55 °C (Europe)	kW	5.33 / 5.30	6.80 / 7.60	11.00 / 11.00	11.00 / 11.00
Nominal heat output (P _{designh}) cold climate 35 °C / 55 °C	kW	5.40 / 5.20	8.40 / 8.40	13.00 / 14.00	13.00 / 14.00
Nominal heat output (P _{designh}) warm climate 35 °C / 55 °C	kW	5.50 / 5.20	7.00 / 7.45	13.00 / 13.00	13.00 / 13.00
SCOP average climate, 35 °C / 55 °C (Europe)		5.00 / 3.70	5.00 / 3.80	5.33 / 4.08	5.30 / 4.08
SCOP cold climate, 35 °C / 55 °C		4.10 / 3.20	4.20 / 3.40	4.47 / 3.59	4.60 / 3.69
SCOP warm climate, 35 °C / 55 °C		6.30 / 4.50	6.30 / 4.60	5.98 / 4.79	6.29 / 4.78
Energy rating, average climate ²					
The product's room heating efficiency class 35 °C / 55 °C ³		A+++ / A++	A+++ / A+++	A+++ / A+++	A+++ / A+++
The system's room heating efficiency class 35 °C / 55 °C ⁴		A+++ / A+++			
Electrical data					
Rated voltage		400 V 3N ~ 50 Hz	400 V 3N ~ 50 Hz	400 V 3N ~ 50 Hz	400 V 3N ~ 50 Hz
Rated current, heat pump	A _{rms}	4.6	6.9	10	11.5
Max. power, fan	W	30	50	43	69
Fuse	A _{rms}	6	10	10	16
Enclosure class		IP24			
Residual current device (RCD), type		F or B			
Refrigerant circuit					
Type of refrigerant		R290			
GWP refrigerant		0,02			
Filling amount	kg	0.8	0.8	1.15	1.15
Type of compressor		Rotary compressor	Rotary compressor	Scroll compressor	Scroll compressor
CO ₂ -equivalent (The cooling circuit is hermetically sealed.)	kg	0.016	0.016	0.023	0.023
Cut-out value pressure switch HP (BP1)	MPa (bar)	3.15 (31.5)			
Difference pressostat HP	MPa (bar)	0.7 (7.0)			
Cut-out value pressure switch LP (BP2)	MPa (bar)	0.03 (0.3)	0.03 (0.3)	0.02 (0.2)	0.02 (0.2)
Difference pressostat LP	MPa (bar)	0.07 (0.7)	0.07 (0.7)	0.05 (0.5)	0.05 (0.5)
Airflow					
Max airflow	m ³ /h	2,400	2,950	3,100	3,800
Working area					
Min./max. air temperature, heating	°C	-25 / 38	-25 / 38	-25 / 40	-25 / 40
Min./max. air temperature, cooling	°C	15 / 43	15 / 43	15 / 45	15 / 45
Defrosting system		Reverse cycle			
Heating medium circuit					
Max system pressure heating medium	MPa (bar)	0.45 (4.5)			
Cut-off pressure, heating medium	MPa (bar)	0.25 (2.5)			
Recommended flow interval, heating operation	l/s	0.08 – 0.32	0.12 – 0.48	0.16 – 0.64	0.20 – 0.80
Min. design flow, defrosting (100% pump speed)	l/s	0.32	0.32	0.38	0.48
Min./max. HM temp, continuous operation	°C	25 / 75			
Connection heating medium JÄSPI Inverter Nordic R		G1" external thread			
Connection heating medium flex pipe		G1" external thread	G1" external thread	G1¼" external thread	G1¼" external thread
Min. recommended pipe dimension (system)	DN (mm)	25 (28)	25 (28)	25 (28)	32 (35)
Dimensions and weight					
Width	mm	1,128	1,128	1,278	1,278
Depth	mm	831			

JÄSPI Inverter Nordic R		8	12	16	20
Height	mm	1,080	1,080	1,180	1,180
Weight	kg	179	179	215	215
Miscellaneous					
Part no.		064 365	064 369	064 527	064 528
EPREL		-	214 04 04	-	-

- ¹ Power statements including defrosting according to EN 14511 at heating medium supply corresponding to DT=5 K at 7 / 45.
- ² Reported efficiency for the system also takes the temperature regulator into account. If the system is supplemented with an external additional boiler or solar heating, the total efficiency of the system must be recalculated.
- ³ Scale for the product's efficiency class room heating: A+++ to D. Control module model SMO S.
- ⁴ Scale for the system's efficiency class room heating: A+++ to G. Reported efficiency for the system takes the product's temperature regulator into account. Control module model SMO S.

Energy labelling

INFORMATION SHEET

Supplier		Kaukora
Model		JÄSPI INVERTER NORDIC R-8 1x230 V
Temperature application	°C	35 / 55
Seasonal space heating energy efficiency class, average climate		A+++ / A++
Rated heat output (P_{designh}), average climate	kW	5.3 / 5.3
Annual energy consumption space heating, average climate	kWh	2,196 / 2,939
Seasonal space heating energy efficiency, average climate	%	196 / 146
Sound power level L_{WA} indoors	dB	-
Rated heat output (P_{designh}), cold climate	kW	5.4 / 5.2
Rated heat output (P_{designh}), warm climate	kW	5.5 / 5.2
Annual energy consumption space heating, cold climate	kWh	3,238 / 4,055
Annual energy consumption space heating, warm climate	kWh	1,161 / 1,570
Seasonal space heating energy efficiency, cold climate	%	161 / 123
Seasonal space heating energy efficiency, warm climate	%	250 / 174
Sound power level L_{WA} outdoors	dB	49

Supplier		Kaukora			
Model		JÄSPI INVERTER NORD- IC R-8 3x400 V	JÄSPI INVERTER NORD- IC R-12 3x400 V	JÄSPI INVERTER NORD- IC R-16 3x400 V	JÄSPI INVERTER NORD- IC R-20 3x400 V
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	5.3 / 5.3	6.8 / 7.6	11.0 / 11.0	11.0 / 11.0
Annual energy consumption space heating, average climate	kWh	2,196 / 2,939	2,835 / 4,102	4,264 / 5,571	4288 / 5571
Seasonal space heating energy efficiency, average climate	%	196 / 146	195 / 150	210 / 160	209 / 160
Sound power level L_{WA} indoors	dB	-	-	-	-
Rated heat output (P_{designh}), cold climate	kW	5.4 / 5.2	8.4 / 8.4	13.0 / 14.0	13.0 / 14.0
Rated heat output (P_{designh}), warm climate	kW	5.5 / 5.2	7.0 / 7.5	13.0 / 13.0	13.0 / 13.0
Annual energy consumption space heating, cold climate	kWh	3,238 / 4,055	4,990 / 6,189	7170 / 9638	6960 / 9361
Annual energy consumption space heating, warm climate	kWh	1,161 / 1,570	1,494 / 2,180	2903 / 3627	2759 / 3631
Seasonal space heating energy efficiency, cold climate	%	161 / 123	163 / 131	176 / 140	181 / 144
Seasonal space heating energy efficiency, warm climate	%	250 / 174	247 / 180	236 / 189	249 / 188
Sound power level L_{WA} outdoors	dB	49	49	55	55

DATA FOR ENERGY EFFICIENCY OF THE PACKAGE

Model		JÄSPI INVERTER NORDIC R-8 1x230 V
Control module model		JÄSPI MCU40
Temperature application	°C	35 / 55
Controller, class		VI
Controller, contribution to efficiency	%	4.0
Seasonal space heating energy efficiency of the package, average climate	%	200 / 150
Seasonal space heating energy efficiency class of the package, average climate		A+++ / A+++
Seasonal space heating energy efficiency of the package, cold climate	%	165 / 127
Seasonal space heating energy efficiency of the package, warm climate	%	254 / 178

Model		JÄSPI INVERTER NORD- IC R-8 3x400 V	JÄSPI INVERTER NORD- IC R-12 3x400 V	JÄSPI INVERTER NORD- IC R-16 3x400 V	JÄSPI INVERTER NORD- IC R-20 3x400 V
Control module model		JÄSPI MCU40	JÄSPI MCU40	JÄSPI MCU40	JÄSPI MCU40
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	%	200 / 150	199 / 154	214 / 164	213 / 164
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	%	165 / 127	167 / 135	180 / 144	185 / 148
Seasonal space heating energy efficiency of the package, warm climate	%	254 / 178	251 / 184	240 / 193	253 / 192

Reported efficiency for the system also takes the temperature regulator into account. If the system is supplemented with an external additional boiler or solar heating, the total efficiency of the system must be recalculated.

TECHNICAL DOCUMENTATION

Model		JÄSPI INVERTER NORDIC R-8 1x230 V							
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		☒ Medium (55°C) ☐ Low (35°C)							
Applied standards		EN14825 / EN14511 / EN12102							
Rated heat output	Prated	5,3	kW	Seasonal space heating energy efficiency		η_s	146	%	
Declared capacity for space heating at part load and at outdoor temperature T_j				Declared coefficient of performance for space heating at part load and at outdoor temperature T_j					
$T_j = -7\text{ °C}$	P _{dh}	4.6	kW	$T_j = -7\text{ °C}$	COP _d	2.19	-		
$T_j = +2\text{ °C}$	P _{dh}	2.8	kW	$T_j = +2\text{ °C}$	COP _d	3.77	-		
$T_j = +7\text{ °C}$	P _{dh}	2.1	kW	$T_j = +7\text{ °C}$	COP _d	4.75	-		
$T_j = +12\text{ °C}$	P _{dh}	2.3	kW	$T_j = +12\text{ °C}$	COP _d	5.70	-		
$T_j = \text{biv}$	P _{dh}	4.6	kW	$T_j = \text{biv}$	COP _d	2.19	-		
$T_j = \text{TOL}$	P _{dh}	4.8	kW	$T_j = \text{TOL}$	COP _d	2.21	-		
$T_j = -15\text{ °C}$ (if TOL < -20 °C)	P _{dh}		kW	$T_j = -15\text{ °C}$ (if TOL < -20 °C)	COP _d		-		
Bivalent temperature	T _{biv}	-10	°C	Min. outdoor air temperature	TOL	-10	°C		
Cycling interval capacity	P _{ych}		kW	Cycling interval efficiency	COP _{yc}		-		
Degradation coefficient	C _{dh}	0.97	-	Max supply temperature	WTOL	65	°C		
Power consumption in modes other than active mode				Additional heat					
Off mode	P _{OFF}	0.008	kW	Rated heat output	P _{sup}	0.0	kW		
Thermostat-off mode	P _{TO}	0.013	kW						
Standby mode	P _{SB}	0.011	kW	Type of energy input	Electric				
Crankcase heater mode	P _{CK}	0.005	kW						
Other items									
Capacity control	Variable			Rated airflow (air-water)		2,400	m³/h		
Sound power level, indoors/outdoors	L _{WA}	- / 49	dB	Nominal heating medium flow			m³/h		
Annual energy consumption	Q _{HE}	2,939	kWh	Brine flow brine-water or water-water heat pumps			m³/h		
Contact information	Kaukora Oy – PL 21, Tuotekatu 11 – 212 01 Raisio – Suomi								

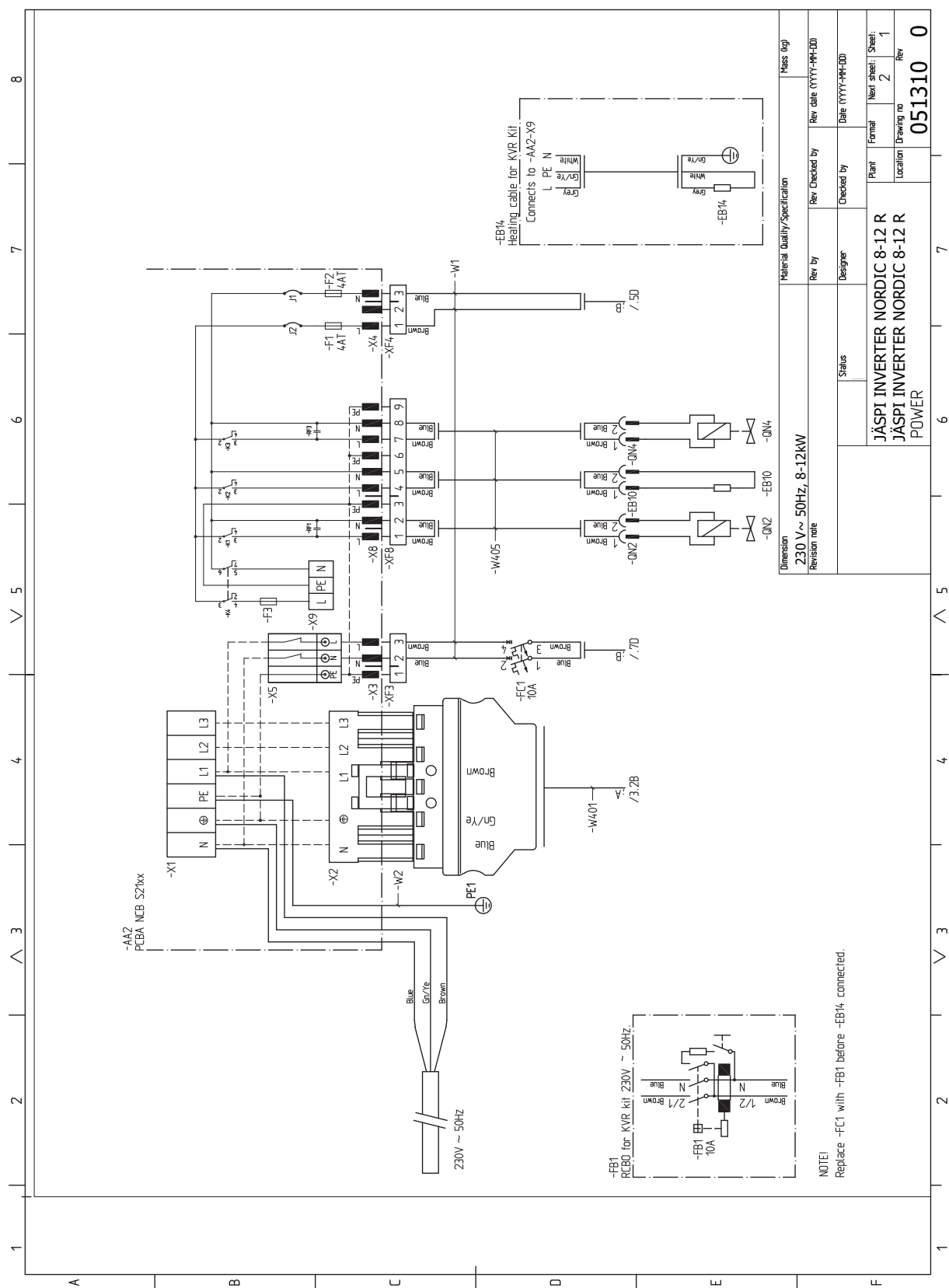
Model		JÄSPI INVERTER NORDIC R-8 3x400 V					
Type of heat pump	☒ Air-water ☐ Exhaust-water ☐ Brine-water ☐ Water-water						
Low-temperature heat pump	☐ Yes ☒ No						
Integrated immersion heater for additional heat	☐ Yes ☒ No						
Heat pump combination heater	☐ Yes ☒ No						
Climate	☒ Average ☐ Cold ☐ Warm						
Temperature application	☒ Medium (55°C) ☐ Low (35°C)						
Applied standards	EN14825 / EN14511 / EN12102						
Rated heat output	Prated	5.3	kW	Seasonal space heating energy efficiency	η_s	146	%
Declared capacity for space heating at part load and at outdoor temperature T_j				Declared coefficient of performance for space heating at part load and at outdoor temperature T_j			
$T_j = -7\text{ °C}$	Pdh	4.6	kW	$T_j = -7\text{ °C}$	COPd	2.19	-
$T_j = +2\text{ °C}$	Pdh	2.8	kW	$T_j = +2\text{ °C}$	COPd	3.77	-
$T_j = +7\text{ °C}$	Pdh	2.1	kW	$T_j = +7\text{ °C}$	COPd	4.75	-
$T_j = +12\text{ °C}$	Pdh	2.3	kW	$T_j = +12\text{ °C}$	COPd	5.70	-
$T_j = \text{biv}$	Pdh	4.6	kW	$T_j = \text{biv}$	COPd	2.19	-
$T_j = \text{TOL}$	Pdh	4.8	kW	$T_j = \text{TOL}$	COPd	2.21	-
$T_j = -15\text{ °C}$ (if TOL < -20 °C)	Pdh		kW	$T_j = -15\text{ °C}$ (if TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-10	°C	Min. outdoor air temperature	TOL	-10	°C
Cycling interval capacity	P _{psych}		kW	Cycling interval efficiency	COP _{psych}		-
Degradation coefficient	Cdh	0.97	-	Max supply temperature	WTOL	65	°C
Power consumption in modes other than active mode				Additional heat			
Off mode	P _{OFF}	0.008	kW	Rated heat output	P _{sup}	0.0	kW
Thermostat-off mode	P _{TO}	0.013	kW				
Standby mode	P _{SB}	0.011	kW	Type of energy input	Electric		
Crankcase heater mode	P _{CK}	0.005	kW				
Other items							
Capacity control	Variable			Rated airflow (air-water)		2,400	m³/h
Sound power level, indoors/outdoors	L _{WA}	- / 49	dB	Nominal heating medium flow			m³/h
Annual energy consumption	Q _{HE}	2,939	kWh	Brine flow brine-water or water-water heat pumps			m³/h
Contact information	Kaukora Oy – PL 21, Tuotekatu 11 – 212 01 Raisio – Suomi						

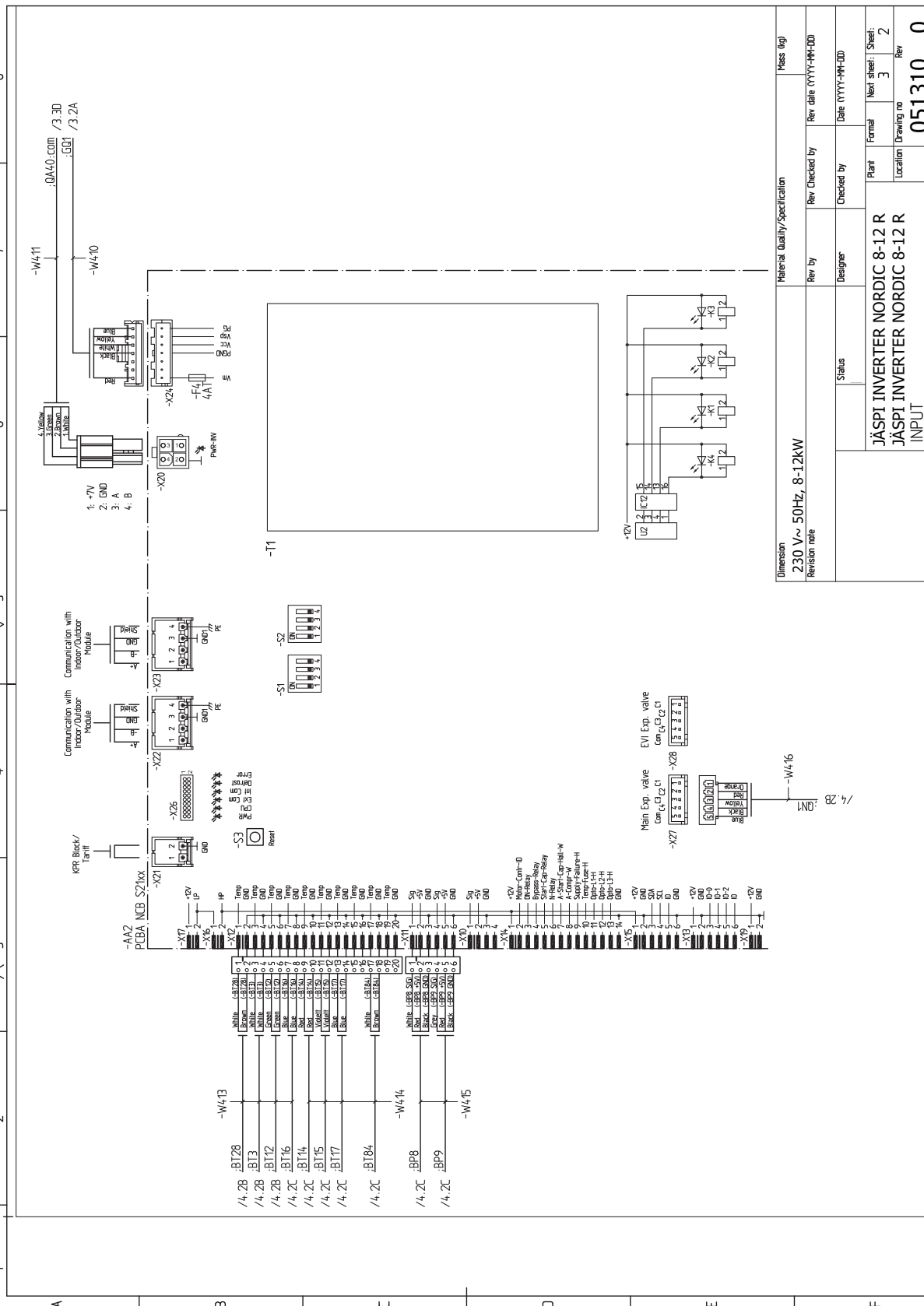
Model		JÄSPI INVERTER NORDIC R-12 3x400 V					
Type of heat pump	☒ Air-water ☐ Exhaust-water ☐ Brine-water ☐ Water-water						
Low-temperature heat pump	☐ Yes ☒ No						
Integrated immersion heater for additional heat	☐ Yes ☒ No						
Heat pump combination heater	☐ Yes ☒ No						
Climate	☒ Average ☐ Cold ☐ Warm						
Temperature application	☒ Medium (55°C) ☐ Low (35°C)						
Applied standards	EN14825 / EN14511 / EN12102						
Rated heat output	Prated	7.6	kW	Seasonal space heating energy efficiency	η_s	150	%
Declared capacity for space heating at part load and at outdoor temperature T_j				Declared coefficient of performance for space heating at part load and at outdoor temperature T_j			
$T_j = -7\text{ °C}$	Pdh	6.7	kW	$T_j = -7\text{ °C}$	COPd	2.17	-
$T_j = +2\text{ °C}$	Pdh	4.2	kW	$T_j = +2\text{ °C}$	COPd	3.83	-
$T_j = +7\text{ °C}$	Pdh	2.7	kW	$T_j = +7\text{ °C}$	COPd	5.12	-
$T_j = +12\text{ °C}$	Pdh	2.4	kW	$T_j = +12\text{ °C}$	COPd	5.87	-
$T_j = \text{biv}$	Pdh	7.6	kW	$T_j = \text{biv}$	COPd	2.11	-
$T_j = \text{TOL}$	Pdh	7.6	kW	$T_j = \text{TOL}$	COPd	2.11	-
$T_j = -15\text{ °C}$ (if TOL < -20 °C)	Pdh		kW	$T_j = -15\text{ °C}$ (if TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-10	°C	Min. outdoor air temperature	TOL	-10	°C
Cycling interval capacity	P _{psych}		kW	Cycling interval efficiency	COP _{psych}		-
Degradation coefficient	Cdh	0.97	-	Max supply temperature	WTOL	65	°C
Power consumption in modes other than active mode				Additional heat			
Off mode	P _{OFF}	0.008	kW	Rated heat output	P _{sup}	0.0	kW
Thermostat-off mode	P _{TO}	0.013	kW				
Standby mode	P _{SB}	0.011	kW	Type of energy input	Electric		
Crankcase heater mode	P _{CK}	0.005	kW				
Other items							
Capacity control	Variable			Rated airflow (air-water)		2,900	m³/h
Sound power level, indoors/outdoors	L _{WA}	- / 49	dB	Nominal heating medium flow			m³/h
Annual energy consumption	Q _{HE}	4,102	kWh	Brine flow brine-water or water-water heat pumps			m³/h
Contact information	Kaukora Oy – PL 21, Tuotekatu 11 – 212 01 Raisio – Suomi						

Model		JÄSPI INVERTER NORDIC R-16 3x400 V							
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		☒ Medium (55°C) ☐ Low (35°C)							
Applied standards		EN14825 / EN14511 /EN12102							
Rated heat output		Prated	11.0	kW	Seasonal space heating energy efficiency		ηs	160	%
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	9.6	kW	Tj = -7 °C		COPd	2.49	-	
Tj = +2 °C	Pdh	5.8	kW	Tj = +2 °C		COPd	4.07	-	
Tj = +7 °C	Pdh	5.1	kW	Tj = +7 °C		COPd	5.25	-	
Tj = +12 °C	Pdh	5.7	kW	Tj = +12 °C		COPd	6.25	-	
Tj = biv	Pdh	10.5	kW	Tj = biv		COPd	2.16	-	
Tj = TOL	Pdh	10.5	kW	Tj = TOL		COPd	2.16	-	
Tj = -15 °C (if TOL < -20 °C)	Pdh		kW	Tj = -15 °C (if TOL < -20 °C)		COPd		-	
Bivalent temperature		Tbiv	-10	°C	Min. outdoor air temperature		TOL	-10	°C
Cycling interval capacity		Ppsych		kW	Cycling interval efficiency		COPcyc		-
Degradation coefficient		Cdh	0.98	-	Max supply temperature		WTOL	65	°C
Power consumption in modes other than active mode					Additional heat				
Off mode		POFF	0.007	kW	Rated heat output		Psup	0.0	kW
Thermostat-off mode		PTO	0.014	kW					
Standby mode		PSB	0.010	kW	Type of energy input		Electric		
Crankcase heater mode		PCK	0.011	kW					
Other items									
Capacity control		Variable		Rated airflow (air-water)			2,900	m³/h	
Sound power level, indoors/outdoors		LWA	- / 55	dB	Nominal heating medium flow				m³/h
Annual energy consumption		QHE	5,571	kWh	Brine flow brine-water or water-water heat pumps				m³/h
Contact information		Kaukora Oy – PL 21, Tuotekatu 11 – 212 01 Raisio – Suomi							

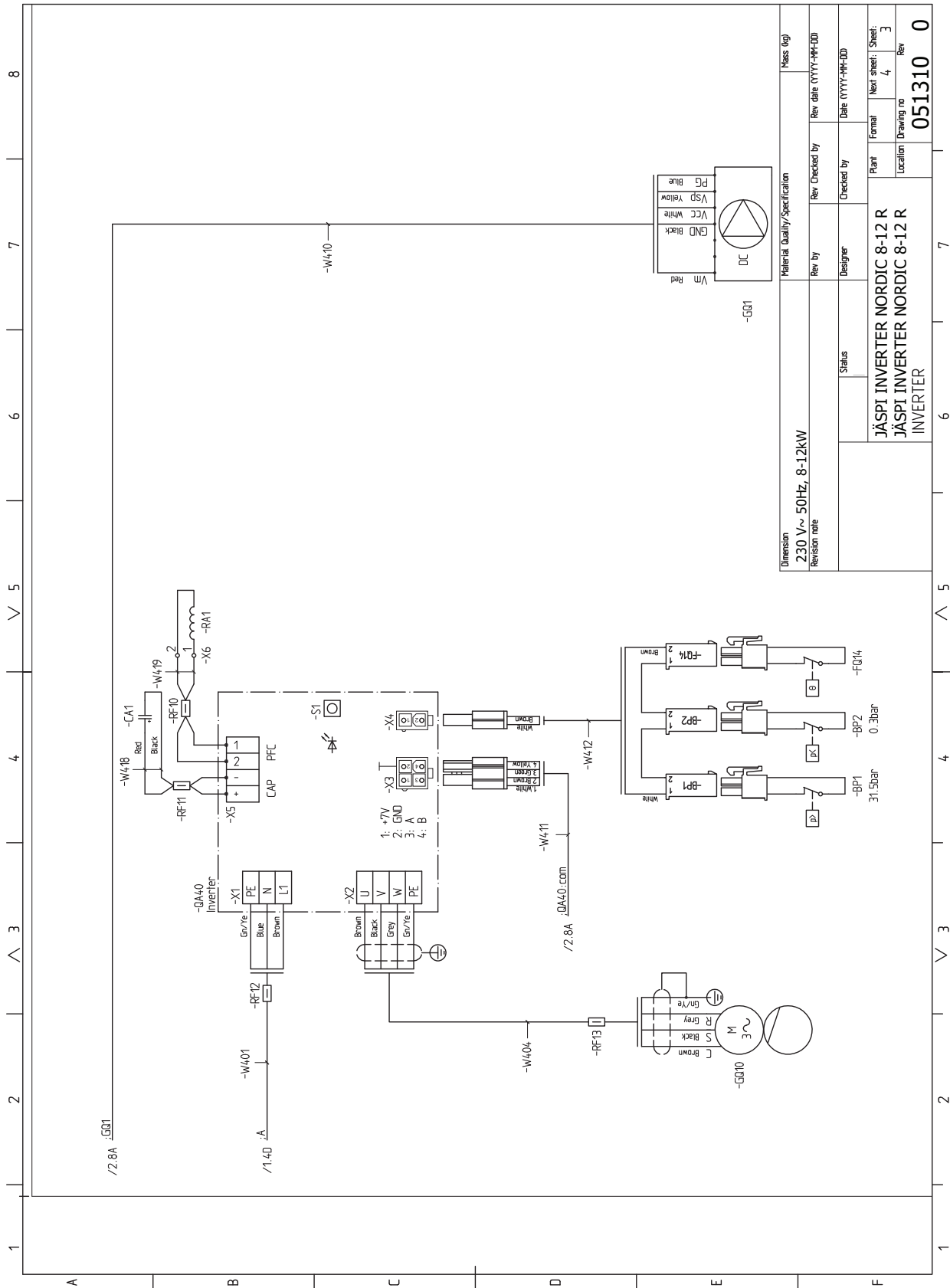
Model		JÄSPI INVERTER NORDIC R-20 3x400 V					
Type of heat pump	☒ Air-water ☐ Exhaust-water ☐ Brine-water ☐ Water-water						
Low-temperature heat pump	☐ Yes ☒ No						
Integrated immersion heater for additional heat	☐ Yes ☒ No						
Heat pump combination heater	☐ Yes ☒ No						
Climate	☒ Average ☐ Cold ☐ Warm						
Temperature application	☒ Medium (55°C) ☐ Low (35°C)						
Applied standards	EN14825 / EN14511 / EN12102						
Rated heat output	Prated	11.0	kW	Seasonal space heating energy efficiency	η_s	160	%
Declared capacity for space heating at part load and at outdoor temperature T_j				Declared coefficient of performance for space heating at part load and at outdoor temperature T_j			
$T_j = -7\text{ °C}$	Pdh	9.6	kW	$T_j = -7\text{ °C}$	COPd	2.49	-
$T_j = +2\text{ °C}$	Pdh	5.8	kW	$T_j = +2\text{ °C}$	COPd	4.07	-
$T_j = +7\text{ °C}$	Pdh	5.1	kW	$T_j = +7\text{ °C}$	COPd	5.25	-
$T_j = +12\text{ °C}$	Pdh	5.7	kW	$T_j = +12\text{ °C}$	COPd	6.25	-
$T_j = \text{biv}$	Pdh	10.5	kW	$T_j = \text{biv}$	COPd	2.16	-
$T_j = \text{TOL}$	Pdh	10.5	kW	$T_j = \text{TOL}$	COPd	2.16	-
$T_j = -15\text{ °C}$ (if TOL < -20 °C)	Pdh		kW	$T_j = -15\text{ °C}$ (if TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-10	°C	Min. outdoor air temperature	TOL	-10	°C
Cycling interval capacity	P _{psych}		kW	Cycling interval efficiency	COP _{psych}		-
Degradation coefficient	Cdh	0.98	-	Max supply temperature	WTOL	65	°C
Power consumption in modes other than active mode				Additional heat			
Off mode	P _{OFF}	0.007	kW	Rated heat output	P _{sup}	0.0	kW
Thermostat-off mode	P _{TO}	0.014	kW				
Standby mode	P _{SB}	0.010	kW	Type of energy input	Electric		
Crankcase heater mode	P _{CK}	0.011	kW				
Other items							
Capacity control	Variable			Rated airflow (air-water)		2,900	m³/h
Sound power level, indoors/outdoors	L _{WA}	- / 55	dB	Nominal heating medium flow			m³/h
Annual energy consumption	Q _{HE}	5,571	kWh	Brine flow brine-water or water-water heat pumps			m³/h
Contact information	Kaukora Oy – PL 21, Tuotekatu 11 – 212 01 Raisio – Suomi						

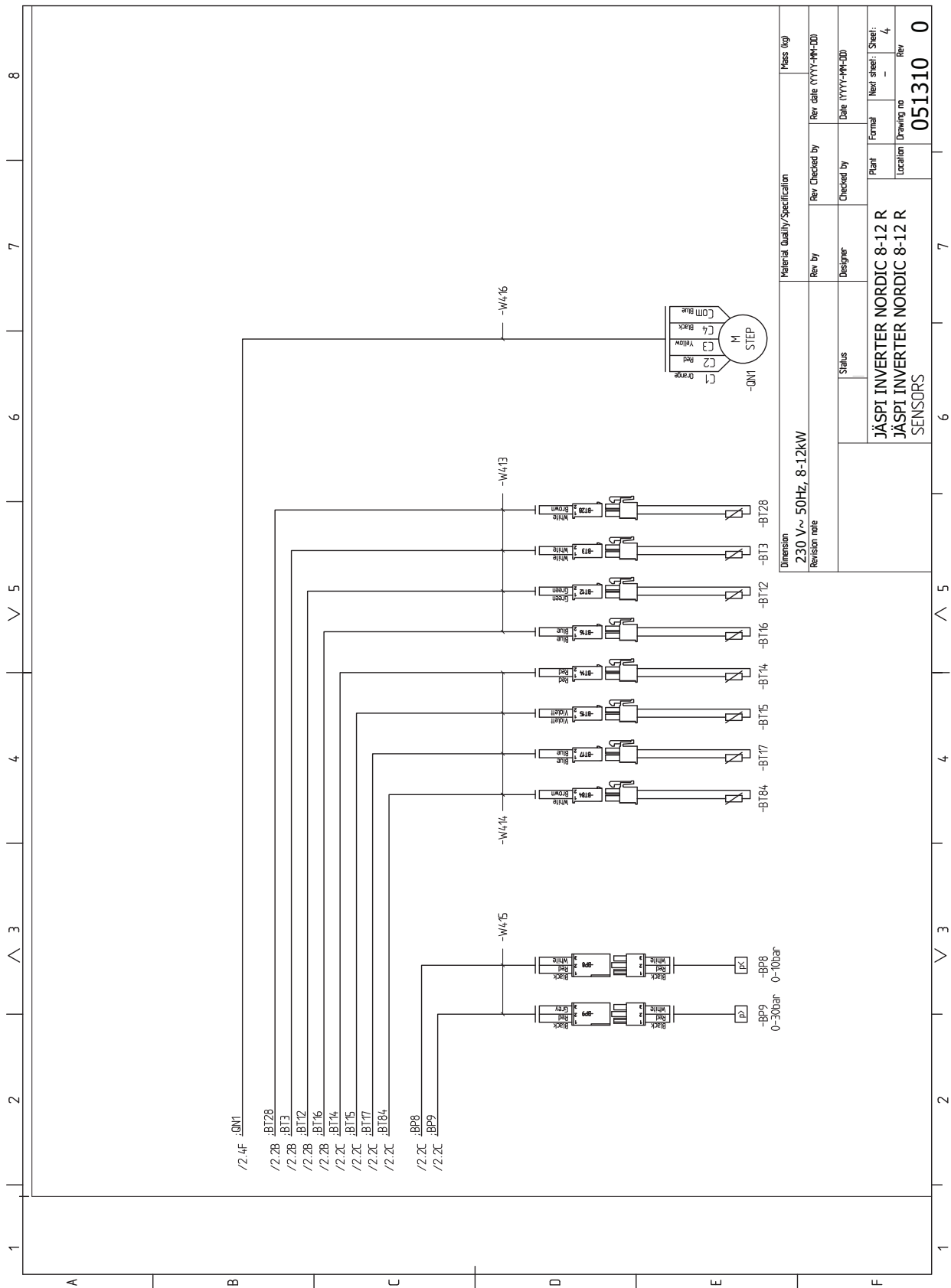
1X230 V



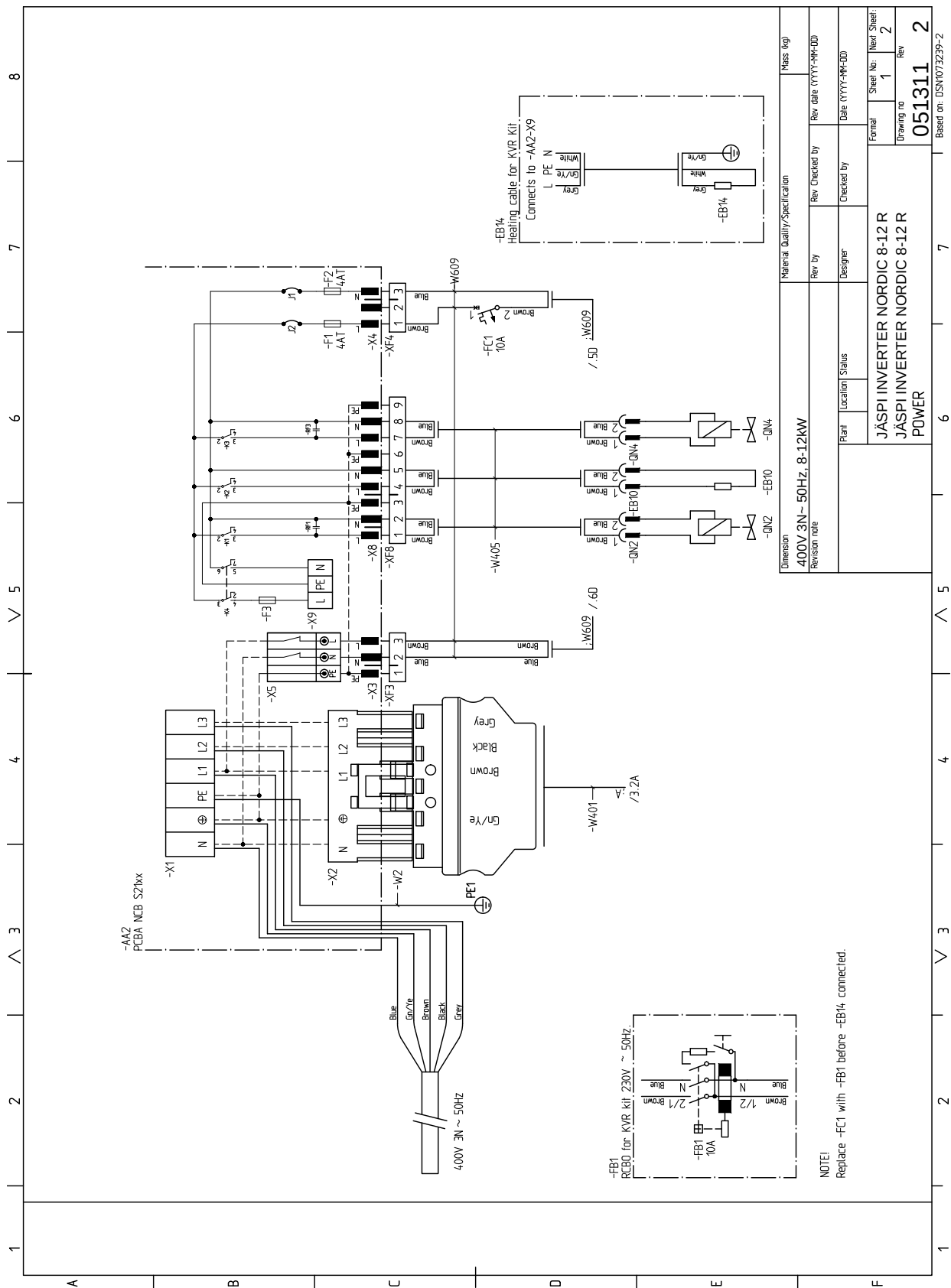


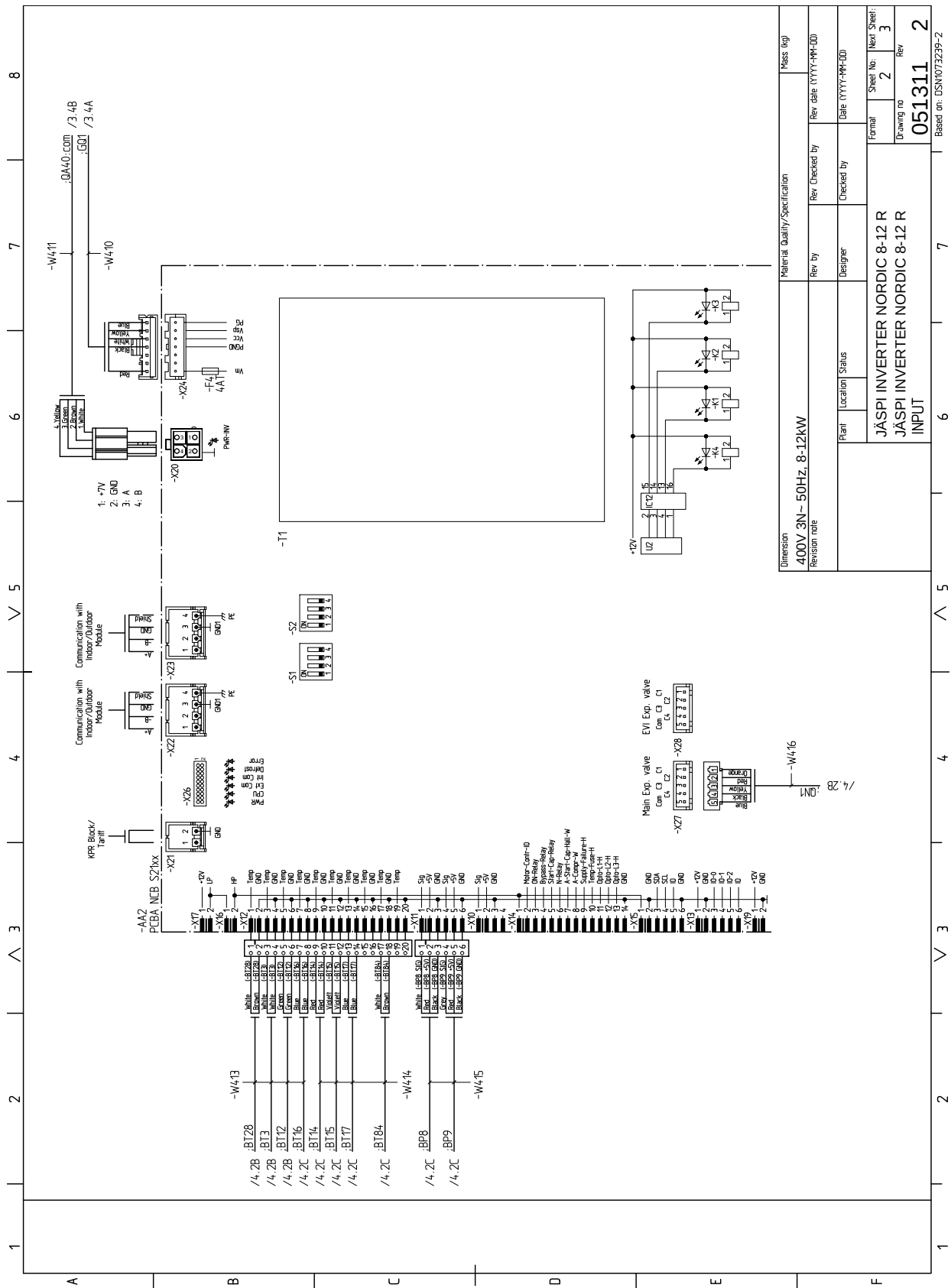
Material Quality/Specification		Mass (kg)	
Dimension	230 V~ 50Hz, 8-12kW	Rev by	Rev date (YYYY-MM-DD)
Revision note		Checked by	Date (YYYY-MM-DD)
		Status	Plant
			Formal
			Next sheet: 1 Sheet: 2
			Location Drawing no
			Rev
			051310
			0





JÄSPI Inverter Nordic R-8, -12





1 2 3 4 5 6 7 8

2

3

4

5

6

7

8

A

B

C

D

E

F

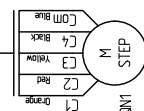
/2 4F -DN1
/2 2B -BT28
/2 2B -BT3
/2 2B -BT12
/2 2B -BT16
/2 2C -BT14
/2 2C -BT15
/2 2C -BT17
/2 2C -BT84
/2 2C -BP8
/2 2C -BP9

-W416

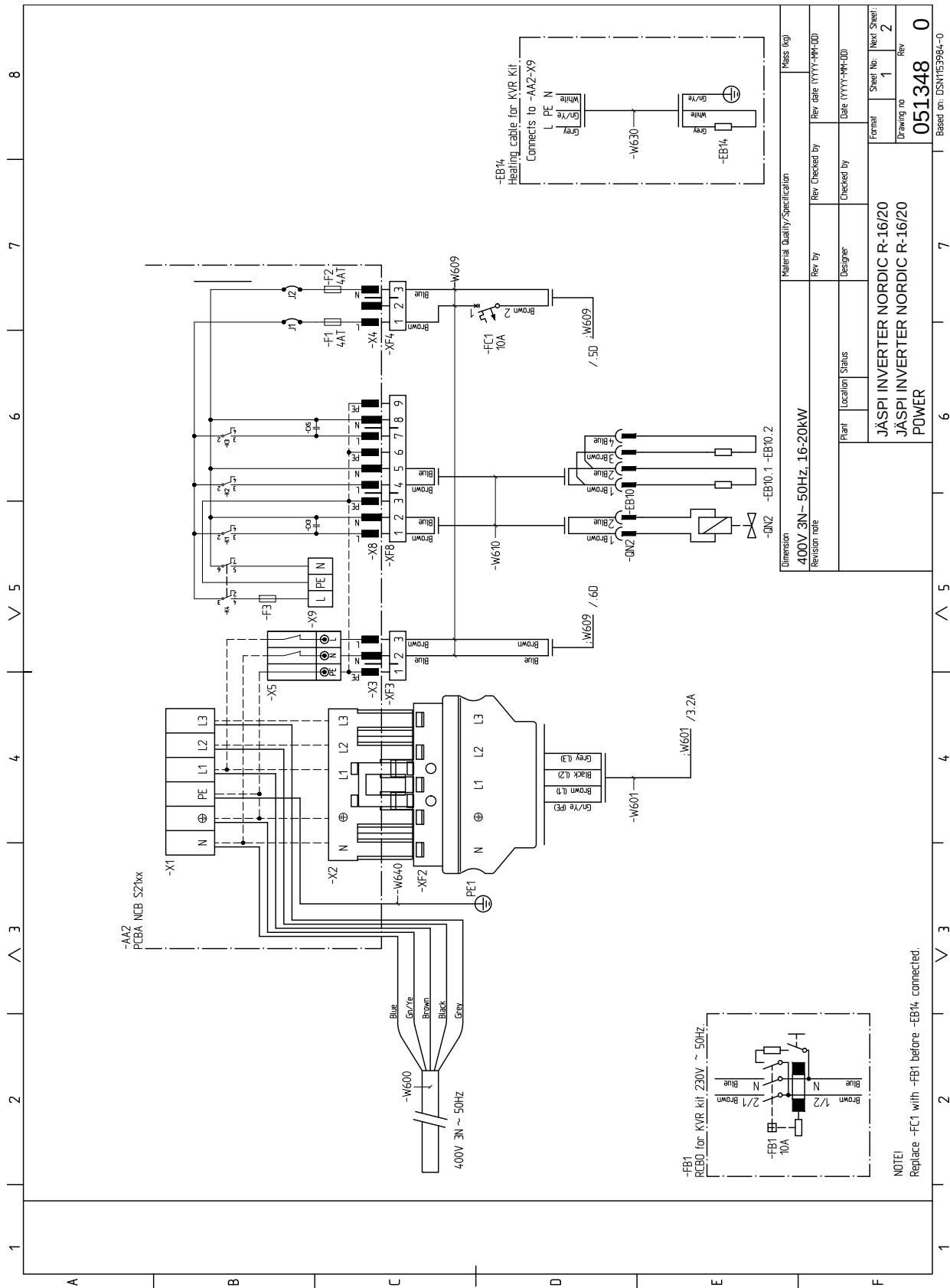
-W413

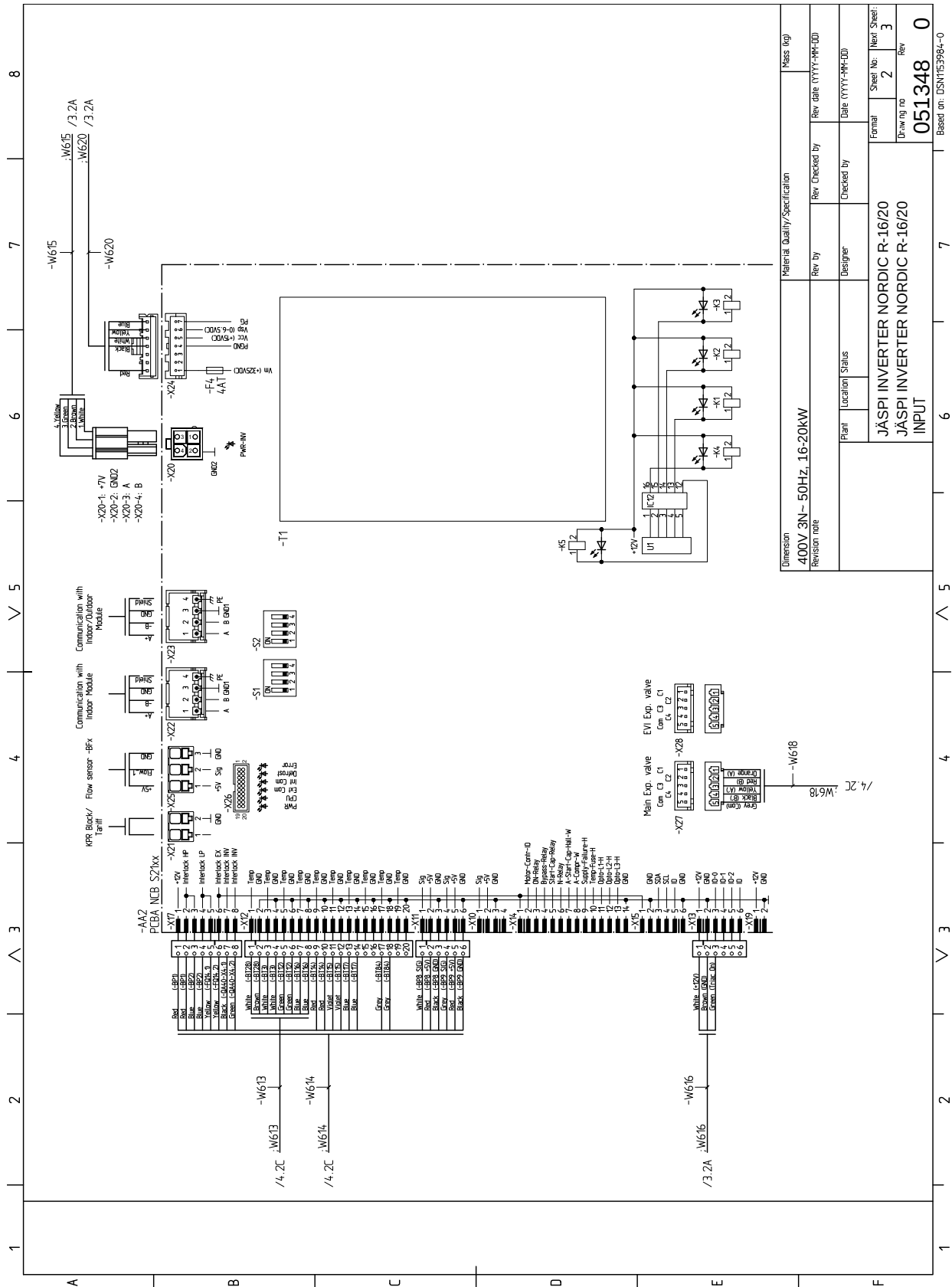
-W414

-W415

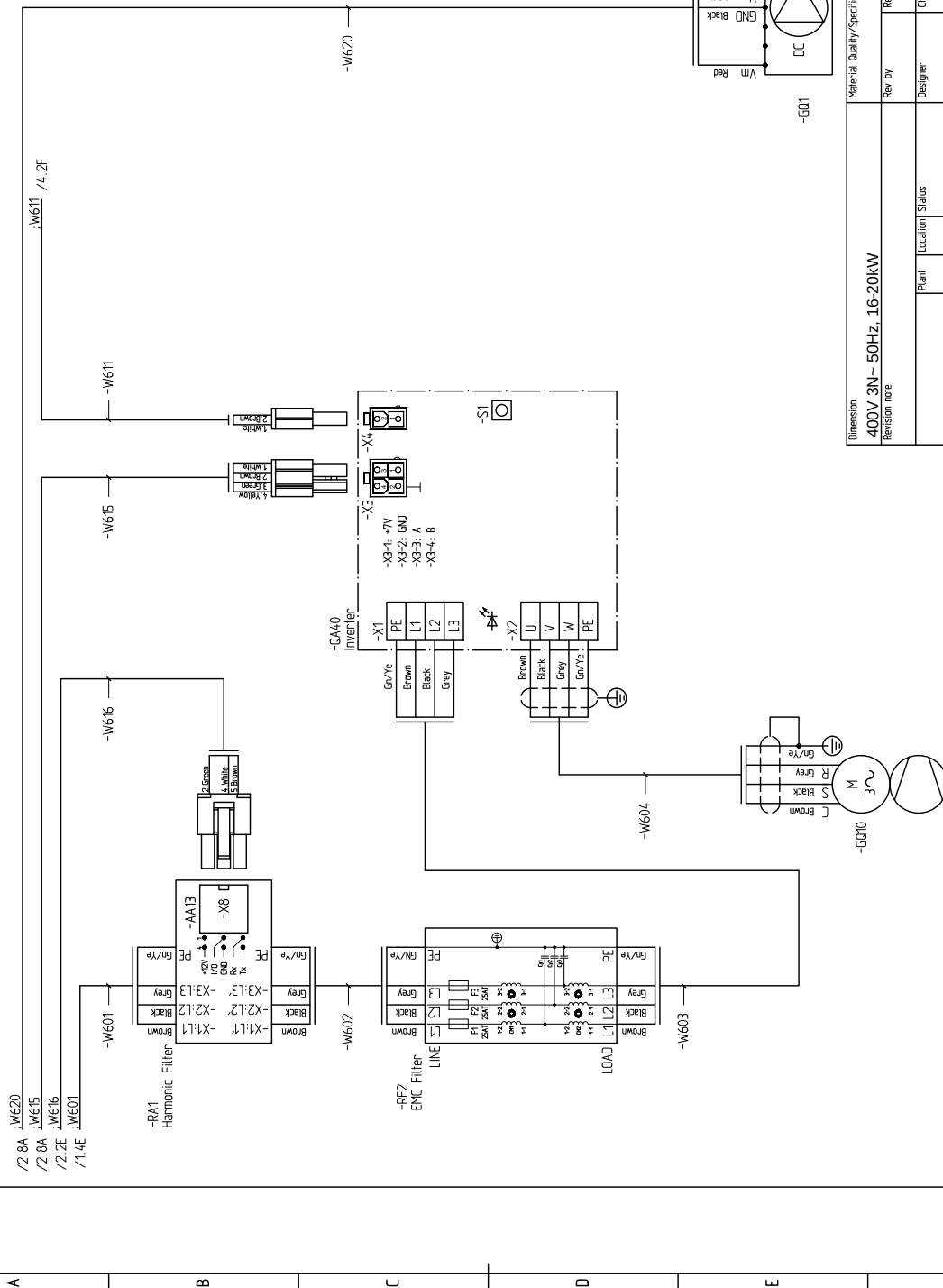


Dimension		Material Quality/Specification		Mass log	
400V 3N~ 50Hz, 8-12kW					
Revision note		Rev by		Rev date (YYYY-MM-DD)	
		Designer		Checked by	
Plant	Location	Status			
JÁSPI INVERTER NORDIC 8-12 R					
JASPI INVERTER NORDIC 8-12 R					
SENSORS					
		Formal		Sheet No:	Next Sheet:
				4	-
		Drawing no		Rev	
		051311		2	
				Based on: DSN073239-2	

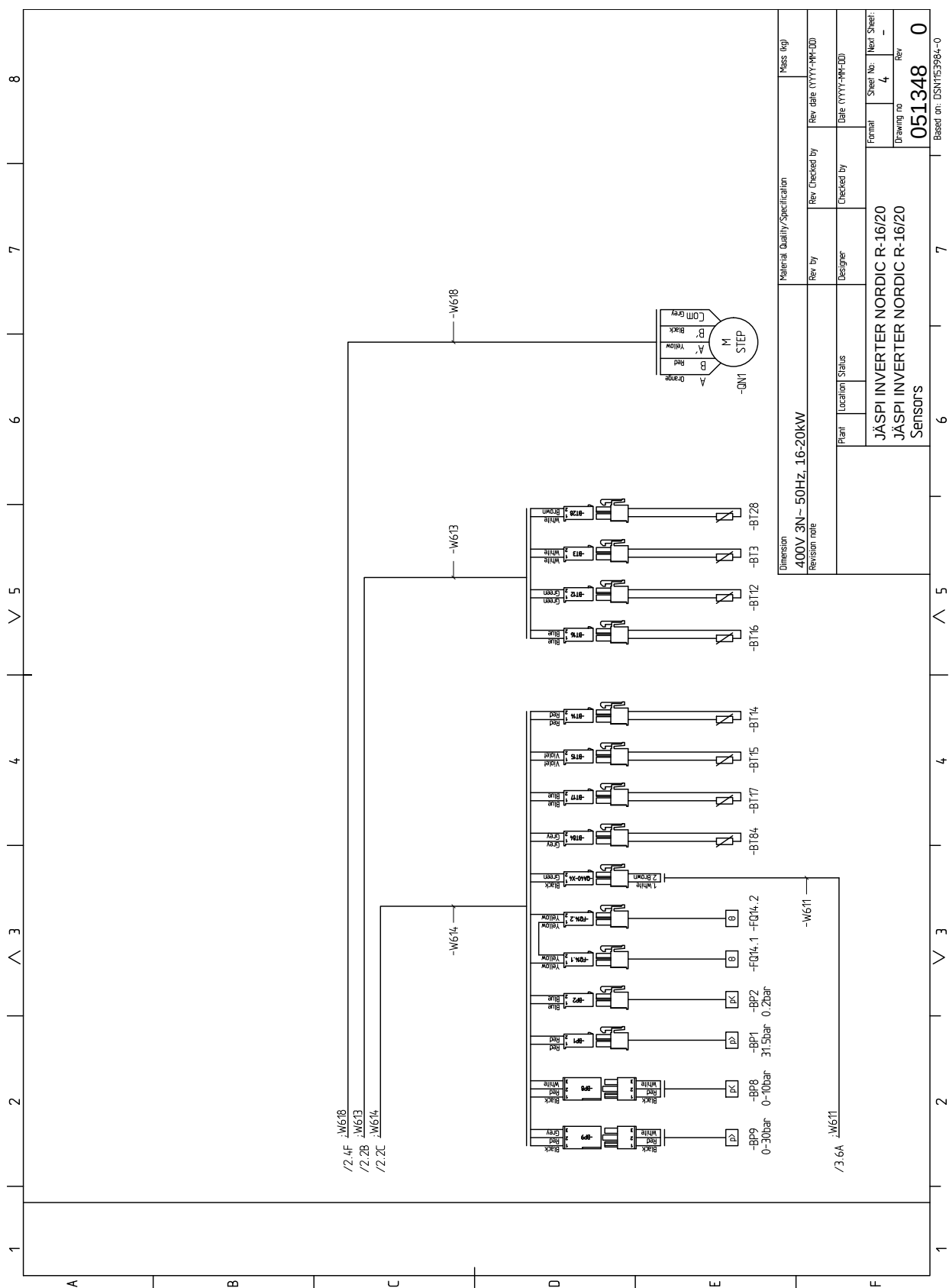




1 2 3 4 5 6 7 8



Dimension		Material Quality/Specification		Mass (kg)	
400V 3N-50Hz, 16.20kW					
Revision rule		Rev by	Rev Checked by	Rev date (YYYY-MM-DD)	
		Designer	Checked by	Date (YYYY-MM-DD)	
		Plant	Location	Status	
		JÄSPI INVERTER NORDIC R-16/20		Sheet No:	Next Sheet:
		JÄSPI INVERTER NORDIC R-16/20		3	4
		Inverter		Drawing no	Rev
				051348	0
				Based on: DSNTS3984-0	



Item register

- A**
 - Accessories, 40
 - Adjustment, charge flow, 30
 - Alarm list, 37
 - Assembly, 7
- B**
 - Basic actions, 35
- C**
 - Charge pump, 30
 - Commissioning, 29
 - Commissioning and adjusting, 29
 - Adjustment, charge flow, 30
 - Charge pump, 30
 - Commissioning, 29
 - Filling and venting the heating medium system, 29
 - Post adjustment and bleeding, 29
 - Preparations, 29
 - Communication, 27
 - Compressor heater, 29
 - Condensation, 8
 - Connecting to air/water heat pump, 23
 - Connections, 25
 - Control, 31
 - Control conditions, 31
 - Control conditions, defrosting, 31
 - Control - Introduction, 31
 - General, 31
 - Control conditions, 31
 - Control conditions defrosting, 31
 - Control - Heat pump EB101, 32
 - Control – Heat pump EB101
 - Heat pump settings – 5.11.1.1, 32
 - Control - Introduction, 31
- D**
 - Data for energy efficiency of the system, 52
 - Delivery and handling, 6
 - Assembly, 7
 - Compressor heater, 29
 - Condensation, 8
 - Handling panels, 10
 - Installation area, 7
 - Installation of automatic gas separator, 11
 - Lift to installation location, 6
 - Supplied components, 9
 - Transport, 6
 - Dimensions, 41
 - DIP switches, 27
 - Disruption to comfort
 - Temperature sensor data, 34
 - Distribution boxes, 20
 - Disturbances in comfort, 35
 - Alarm list, 37
 - Troubleshooting, 35
 - Draining the heat pump, 34
- E**
 - Electrical circuit diagram, 58
 - Electrical connections, 24
 - Communication, 27
 - Connections, 25
 - DIP switches, 27
 - External connections, 26
 - General, 24
 - Power connection, 25
 - Tariff control, 26
 - Terminal blocks, 25
 - Energy labelling, 51
 - Data for energy efficiency of the package, 52
 - Information sheet, 51
 - Technical documentation, 53–54
 - External connections, 26
- F**
 - Filling and venting the heating medium system, 29
 - Flexible pipe connection, 23
- G**
 - General, 24
- H**
 - Handling panels, 10
 - Heat pump settings – 5.11.1.1, 32
 - High room temperature, 35
- I**
 - Ice build-up in the fan, grille and/or fan cone, 35
 - Important information, 4
 - Inspection of the installation, 5
 - Safety information, 4
 - Information sheet, 51
 - Inspection of the installation, 5
 - Installation area, 7
 - Installation of automatic gas separator, 11
 - Installing the installation
 - Symbol key, 22
- J**
 - JÄSPI Inverter Nordic R does not start, 35
 - JÄSPI Inverter Nordic R not communicating, 35
- L**
 - Large amount of water below JÄSPI Inverter Nordic R, 35
 - Lift to installation location, 6
 - Low hot water temperature or no hot water, 35
 - Low room temperature, 35
- M**
 - Marking, 4
- P**
 - Pipe connections, 22
 - Connecting to air/water heat pump, 23
 - Flexible pipe connection, 23
 - General, 22
 - Symbol key, 22
 - Water volumes, 22
 - Post adjustment and bleeding, 29
 - Power connection, 25
 - Preparations, 29
- S**
 - Safety information, 4
 - Marking, 4
 - Serial number, 4
 - Symbols, 4
 - Serial number, 4
 - Service, 34
 - Service actions, 34
 - Service actions, 34

Service measures

Draining the heat pump, 34

Sound levels, 43

Supplied components, 9

Symbol key, 22

Symbols, 4

T

Tariff control, 26

Technical data, 41

Dimensions, 41

Electrical circuit diagram, 58

Energy labelling, 51

Data for energy efficiency of the system, 52

Information sheet, 51

Technical documentation, 53

Sound pressure levels, 43

Technical Data, 44

Technical Data, 44

Technical documentation, 53

Temperature sensor data, 34

Terminal blocks, 25

The heat pump design, 14

Component locations, 14

List of components, 14

The heat pump's design

Distribution boxes, 20

Transport, 6

Troubleshooting, 35

Basic actions, 35

High room temperature, 35

Ice build-up in the fan, grille and/or fan cone, 35

JÄSPI Inverter Nordic R does not start, 35

JÄSPI Inverter Nordic R not communicating, 35

Large amount of water below JÄSPI Inverter Nordic R, 35

Low hot water temperature or no hot water, 35

Low room temperature, 35

Kaukora Oy
PL 21, Tuotekatu 11
212 01 Raisio
+358 2 437 4600
E-mail: kaukora@kaukora.fi
www.jaspi.fi

Subject to any factual or printing errors.

IHB EN 2638-1 931683



931683

Subject to any factual or printing errors.