JÄSPI SPLITBOX

6, 8-12, 16

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1 Important information

System solution

SPLITBOX is intended for installation together with outdoor module and indoor module (TW Air) or control module (MCU 40) for a complete system solution.

Safety information

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

The manual must be left with the customer.

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.

IP21 Classification of enclosure of electro-technical equipment.

Danger to person or machine.

Read the User Manual.

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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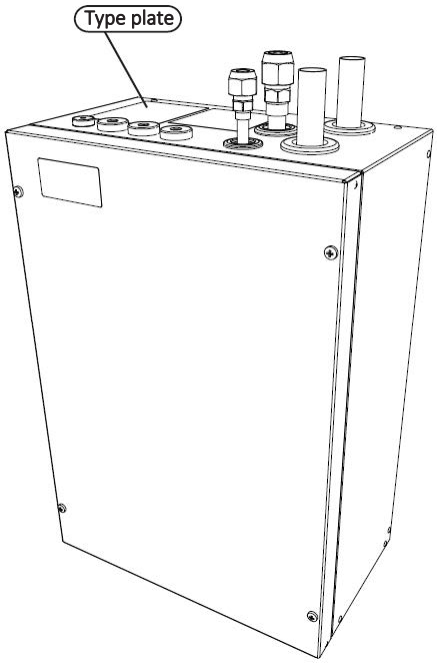
Serial number

The serial number (PF3) is on the cover.



Caution

You need the product's serial number for servicing and support.

Recycling

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

The device (SPLITBOX 8-12, 16) contains R410A, a fluorinated greenhouse gas with a GWP value (Global warming potential) of 2088. Do not release R410A into the air.

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 17)				
	System flushed			
	System vented			
	Particle filter			
	Shut-off and drain 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			
	Outdoor unit addressed (only when cascade connection)			
	When installing Split 6, check that the soft-ware version of the indoor module /control module is at least v8320.			
Miscellaneous				
	Condensation water pipe			

Caution

SplitBox 6 is only compatible with Split 6 outdoor unit.

SplitBox 8-12 is only compatible with Split 8 and Split 12 outdoor units.

Checklist: Checks before commissioning

Refrigerant system	*Notes*	*Checked*
Pipe length		☐
Height difference		☐
Pressurization test		☐
Leak testing		☐
End pressure vacuum		☐
Pipe insulation		☐

Electrical installation	*Notes*	*Checked*
Property's main fuse		☐
Group fuse		☐
Current limiter/current sensor		☐
KVR 10		☐

Cooling	*Notes*	*Checked*
Pipe system, condensation insulation		☐
		☐

Compatible indoor modules Tehowatti Air and control modules MCU 40

All outdoor units Jäspi Split 6-12 together with SplitBox are compatible with Tehowatti Air indoor unit and MCU 40 control unit.

Tehowatti Air	product no. 5058528
MCU 40	product no. T000676

2 Delivery and handling

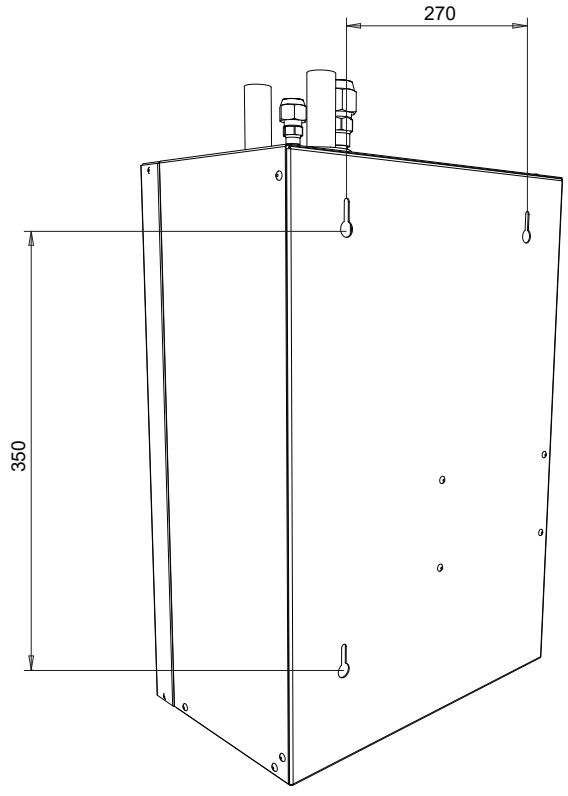
Transport and storage

Jäspi SPLITBOX should be transported and stored vertically in a dry place.

Jäspi SPLITBOX

- It is recommended that Jäspi SPLITBOX is installed in a room with existing floor drainage, most suitably in a utility room or boiler room.
- SPLITBOX should be installed vertically on the wall.
- Route pipes so they are not fixed to an internal wall that backs on to a bedroom or living room.
- Ensure that there is approx. 800 mm free space in front of and 150 mm above the product for any future service. Ensure that there is sufficient space above the machine for pipework and valves.

Jäspi SPLITBOX positioning on wall

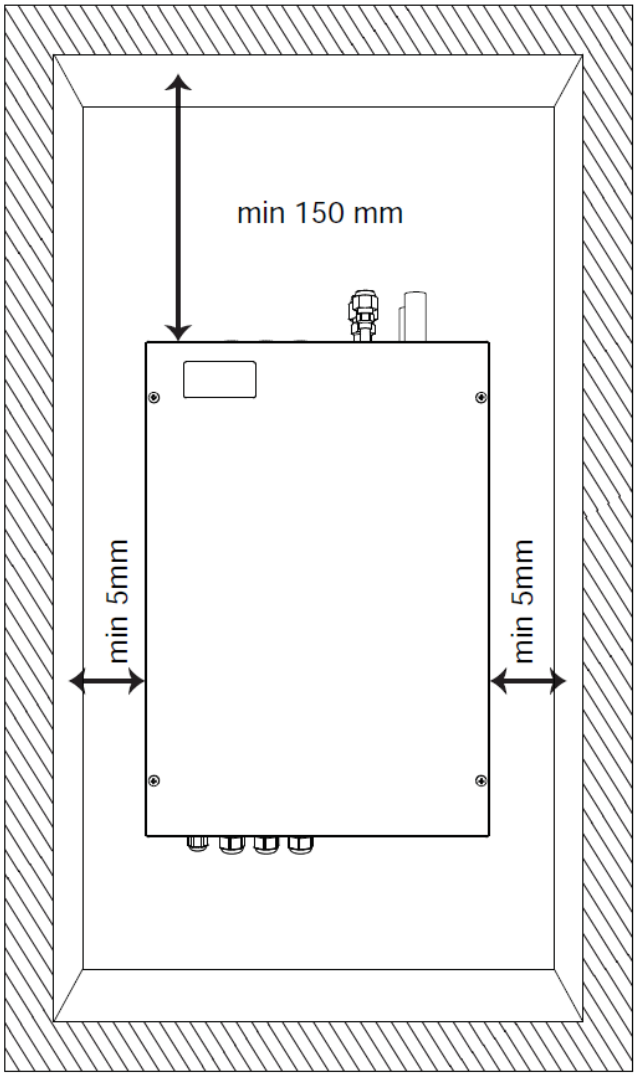


Screw the screws into the wall according to the attached dimension drawing and hang the SPLITBOX on the screw sockets.

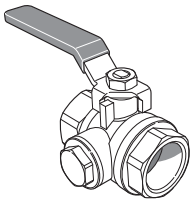
INSTALLATION AREA

There should be free space on at least one side, for any service to SPLITBOX in the future. Ensure that there is also approx. 80 cm free space in front of SPLITBOX.

Recommendation for positioning on wall



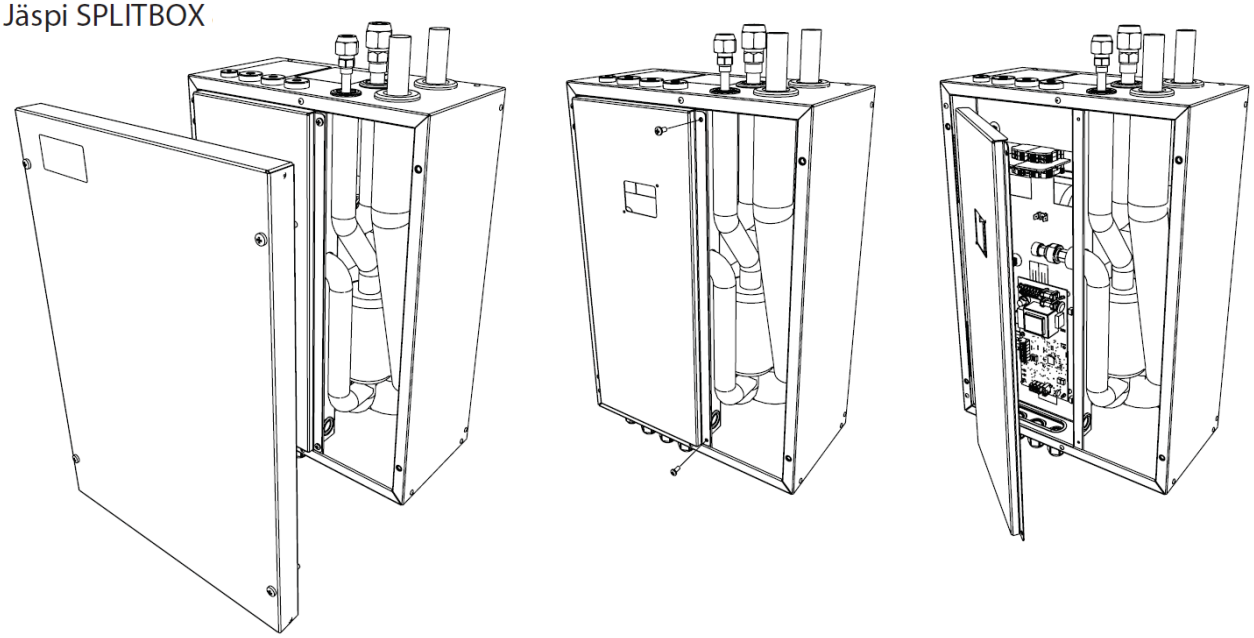
Supplied components



Filterball (G1").

Removing the covers

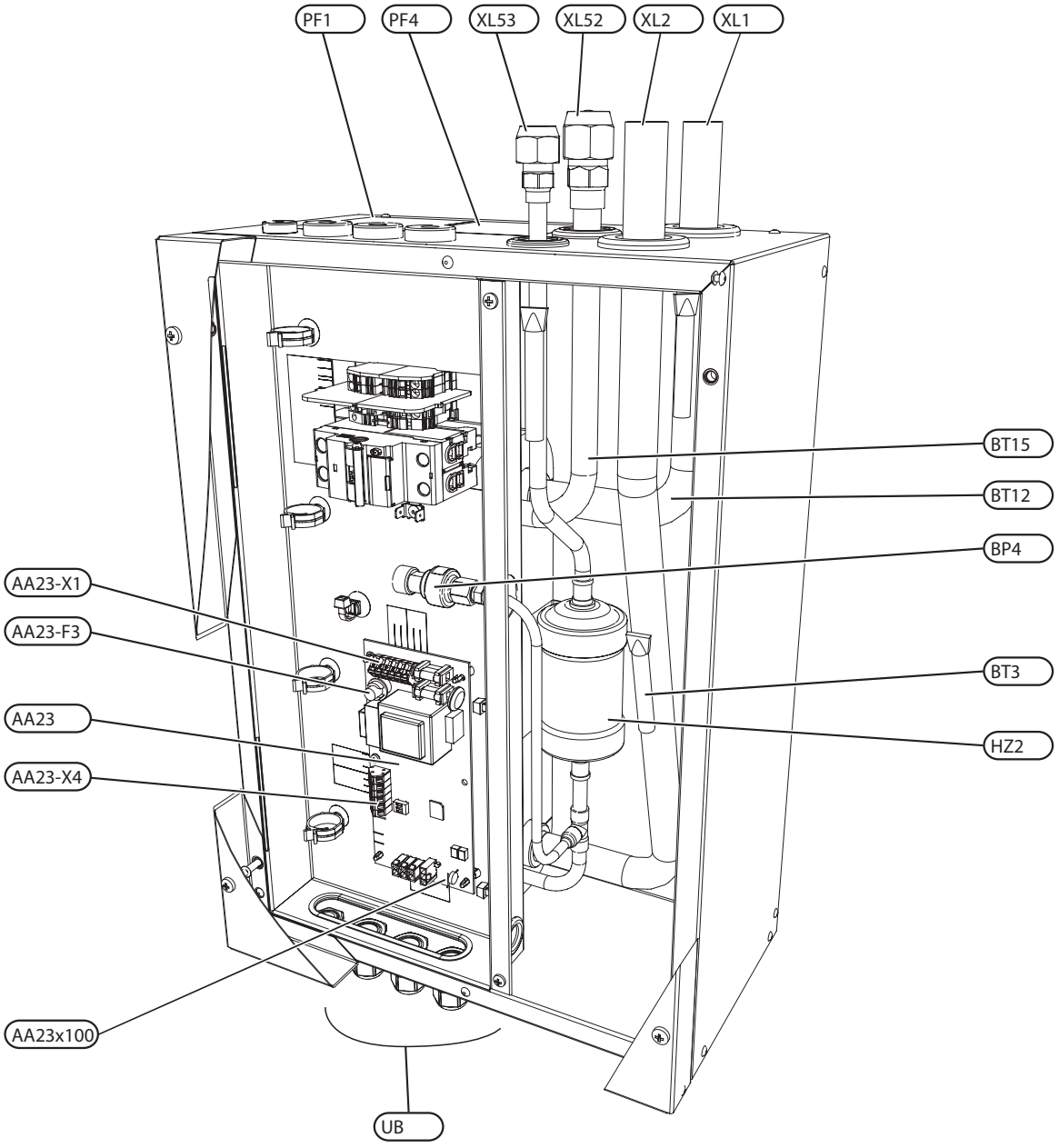
Jäspi SPLITBOX



3 SPLITBOX design

Jäspi SPLITBOX

Component location



List of components
SPLITBOX

PIPE CONNECTIONS

XL1	Climate system supply
XL2	Climate system return
XL52	Connection, gas line
XL53	Connection, liquid line

VALVES ETC.

EP2	Heat exchanger
HZ2	Drying filter
QZ2	Filterball (supplied)

ELECTRICAL COMPONENTS

AA23	Communication board
AA23-F3	Fuse for external heating cable
AA23-S3	DIP switch, addressing of outdoor unit
AA23-X1	Terminal block, incoming supply, connection of KVR 10
AA23-X4	Terminal block, communication with indoor module / control module
AA23-X100	Terminal block, communication outdoor module
X1	Terminal block, incoming supply

SENSOR, THERMOSTATS

BP4	Pressure sensor, high pressure
BT3	Temperature sensor, heating medium, return
BT12	Temperature sensor, condenser, supply
BT15	Temperature sensor, fluid pipe

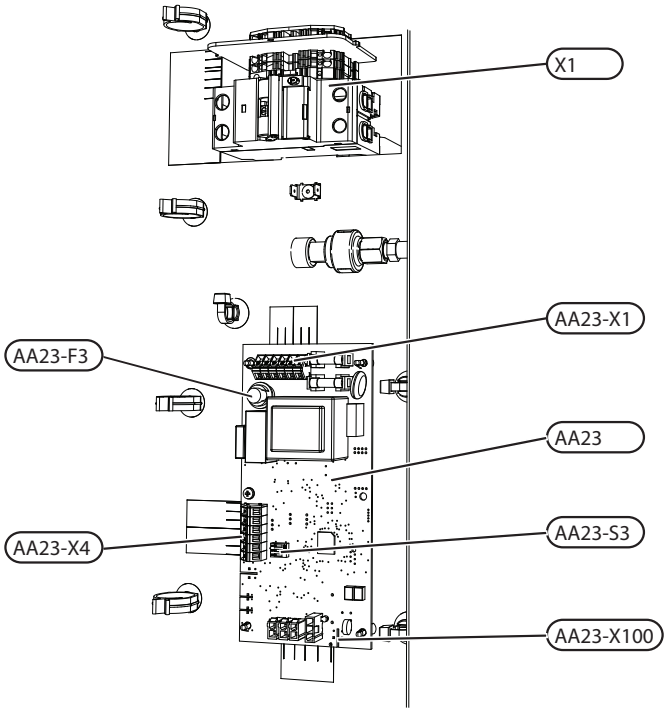
MISCELLANEOUS

PF1	Rating plate
PF3	Serial number plate
PF4	Sign, pipe connections
UB1	Cable gland
UB2	Cable gland
UB3	Cable gland
WP3	Condensation hose

Designations according to standard EN 81346-2.

Electrical panel

SPLITBOX



Electrical components SPLITBOX

AA23	Communication board
AA23-F3	Fuse for external heating cable
AA23-S3	DIP switch, addressing of outdoor unit
AA23-X1	Terminal block, supply voltage to the communication board AA23, connection of KVR 10
AA23-X4	Terminal block, communication with indoor module / control module
AA23-X100	Terminal block, communication outdoor module
X1	Terminal block, incoming supply

4 Pipe connections

General

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

SPLIT outdoor units work up to a return temperature of approx. 55°C and an outgoing temperature from the heat pump of approx. 58 °C.

SPLITBOX is not equipped with shut off valves on the water side, these must be installed to facilitate any future servicing.

When docking with SPLITBOX 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 (Jäspi Buffer) is installed.

NOTE

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

Install the supplied filterball (HQ1) upstream of the inlet, i.e. the connection (XL2, HM return) on SPLITBOX.

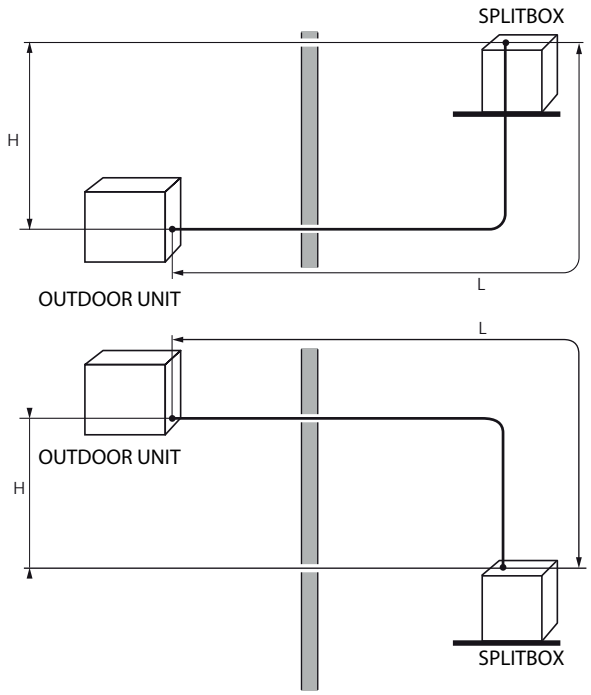
Connecting refrigerant pipes (not supplied)

Install the refrigerant pipes between the outdoor module SPLIT and SPLITBOX.

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

LIMITATIONS SPLIT OUTDOOR UNIT

- Maximum pipe length 15 m, with additional filling 30 m
- Maximum height difference (H): ±7 m.



PIPE DIMENSIONS AND MATERIALS

SPLIT 6

	Gas pipe	*Liquid pipe*
Pipe dimension	Ø12.7 mm (1/2")	Ø6.35 mm (1/4")
Connection	Flare - (1/2")	Flare - (1/4")
Material	Copper quality SS-EN 12735-1 or C1220T, JIS H3300	
Minimum material thickness	1,0 mm	0,8 mm

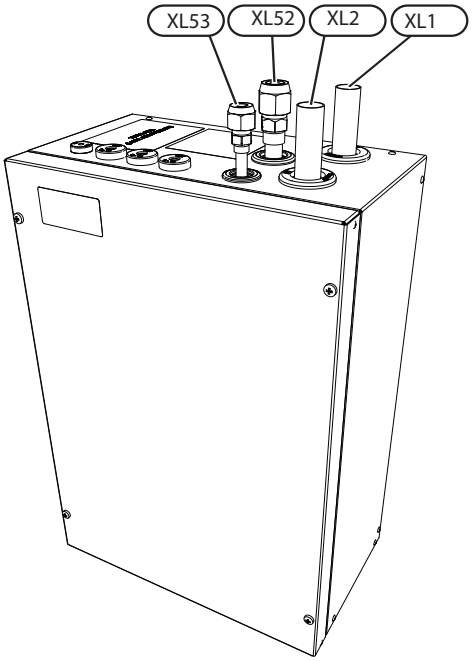
SPLIT 8,12,16

	Gas pipe	*Liquid pipe*
Pipe dimension	Ø15,88 mm (5/8")	Ø9,52 mm (3/8")
Connection	Flare - (5/8")	Flare - (3/8")
Material	Copper quality SS-EN 12735-1 or C1220T, JIS H3300	
Minimum material thickness	1,0 mm	0,8 mm

Pipe connection

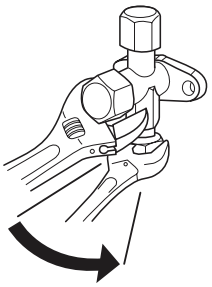
PIPE CONNECTION, REFRIGERANT PIPE

- Perform pipe installation, on the refrigerant side between outdoor module and SPLITBOX, with the service valves (QM35, QM36) closed.
- Connect refrigerant pipes between the service valves (QM35 and QM36) on the outdoor module and the connections (XL52 and XL53) on SPLITBOX.



- Ensure that water or dirt does not enter the pipes.
- Bend the pipes with as large a radius as possible (at least R100-R150). Do not bend a pipe repeatedly. Use a bending tool.
- Connect the flare connector and tighten to the following torque. Use the "Tightening angle" if a torque wrench is not available.

Outer diameter copper pipe (mm)	*Tightening torque (Nm)*	*Tightening angle (°)*	*Recommended tool length (mm)*
Ø6,35	14~18	45~60	150
Ø9,52	34~42	30~45	200
Ø12,7	49~61	30~45	250
Ø15,88	68~82	15~20	300

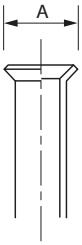


NOTE

Gas shielding must be used when soldering.

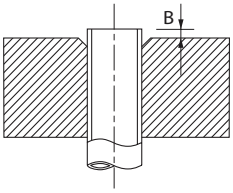
FLARE CONNECTIONS

Expansion:



Outer diameter, copper pipe (mm)	*A (mm)*
Ø6,35	9,1
Ø9,52	13,2
Ø12,7	16,6
Ø15,88	19,7

Ejection:



Outer diameter, copper pipe (mm)	*B, with an R410A tool (mm)*	*B, with a conventional tool (mm)*
Ø6,35	0,0~0,5	1,0~1,5
Ø9,52	0,0~0,5	0,7~1,3
Ø12,7	0,0~0,5	1,0~1,5
Ø15,88	0,0~0,5	0,7~1,3

(Follow instructions for the tool used.)

Pressure test and leak test

Both SPLITBOX and outdoor module are pressure tested and leak tested at the factory, but the pipe connections between the products must be checked after installation.

NOTE

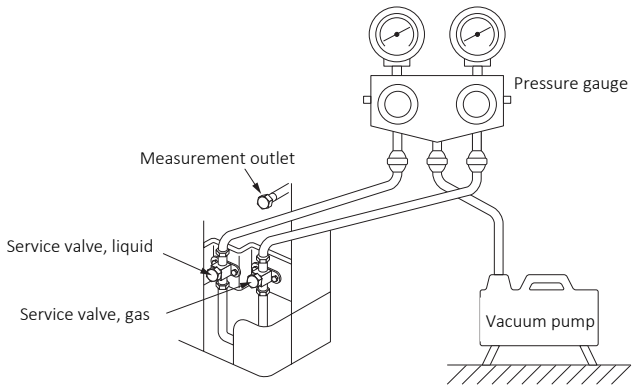
The pipe connection between the products must be pressure tested and leak tested according to the applicable regulations after installation.

Under no circumstances must a type of medium other than nitrogen be used when pressurising or flushing the system.

Vacuum pump

Use a vacuum pump to evacuate all air. Apply suction for at least one hour and end pressure after evacuation must be 1 mbar (100 Pa, 0.75 Torr or 750 micron) absolute pressure.

If the system has remaining moisture or a leak, the vacuum pressure will rise after completed evacuation.



TIP

For a better end result and to quicken the evacuation, the following points must be followed.

- The connection lines must be as large and short as possible.
- Evacuate the system down to 4 mbar and fill the system with dry nitrogen to atmospheric pressure to the finish the evacuation.

Filling refrigerant

Outodoor module is delivered complete with the refrigerant required for the installation of refrigerant pipes up to 15 m in length.

NOTE

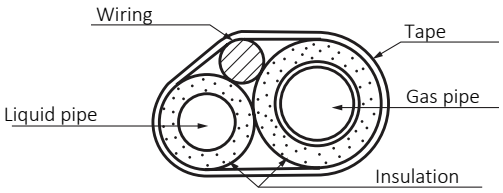
For installations with refrigerant pipes up to 15 m in length, no extra refrigerant in addition to the provided amount needs to be added.

When carrying out pipe connections, pressure tests, leak tests and vacuuming, the service valves (QM35, QM36) can be opened, to fill the pipes and SPLITBOX with refrigerant.

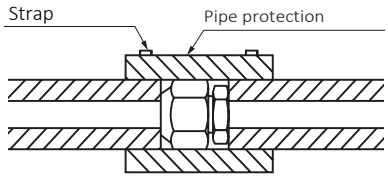
Insulating refrigerant pipes

- Insulate refrigerant pipes (both gas and liquid pipes) for heat insulation and to prevent condensation.
- Use insulation that can withstand at least 120 °C. Poorly insulated pipes can cause insulation related problems and unnecessary cable wear.

Principle:



Connections:

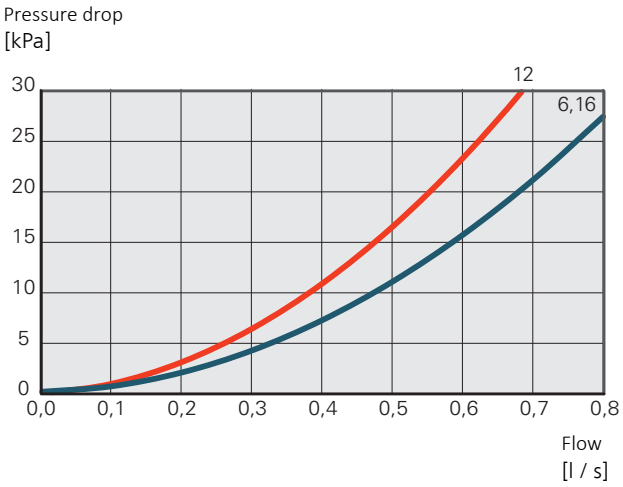


Pipe coupling heating, medium circuit

- SPLITBOX is intended to be connected to Jäspi Split outdoor unit and Tehowatti AIR indoor unit or MCU 40 control unit, in accordance with the system solutions found on our website jaspi.fi.
- Install vent valves if the pipe installation requires them to avoid malfunctions..
- Install the included filterball before the water inlet, i.e. in the connection of the Splitbox (XL2 HW return).
- Install the supplied condensate hose (WP3).

Pressure drop, heating medium side

SPLITBOX



Docking alternatives

SPLITBOX can be installed in several different ways. The required safety equipment must be installed in accordance with current regulations for all docking options. To ensure fault-free operation of the system, it is recommended to give consideration to the values according to the table when adjusting the system.

See jaspi.fi for more docking options.

INSTALLATION REQUIREMENTS

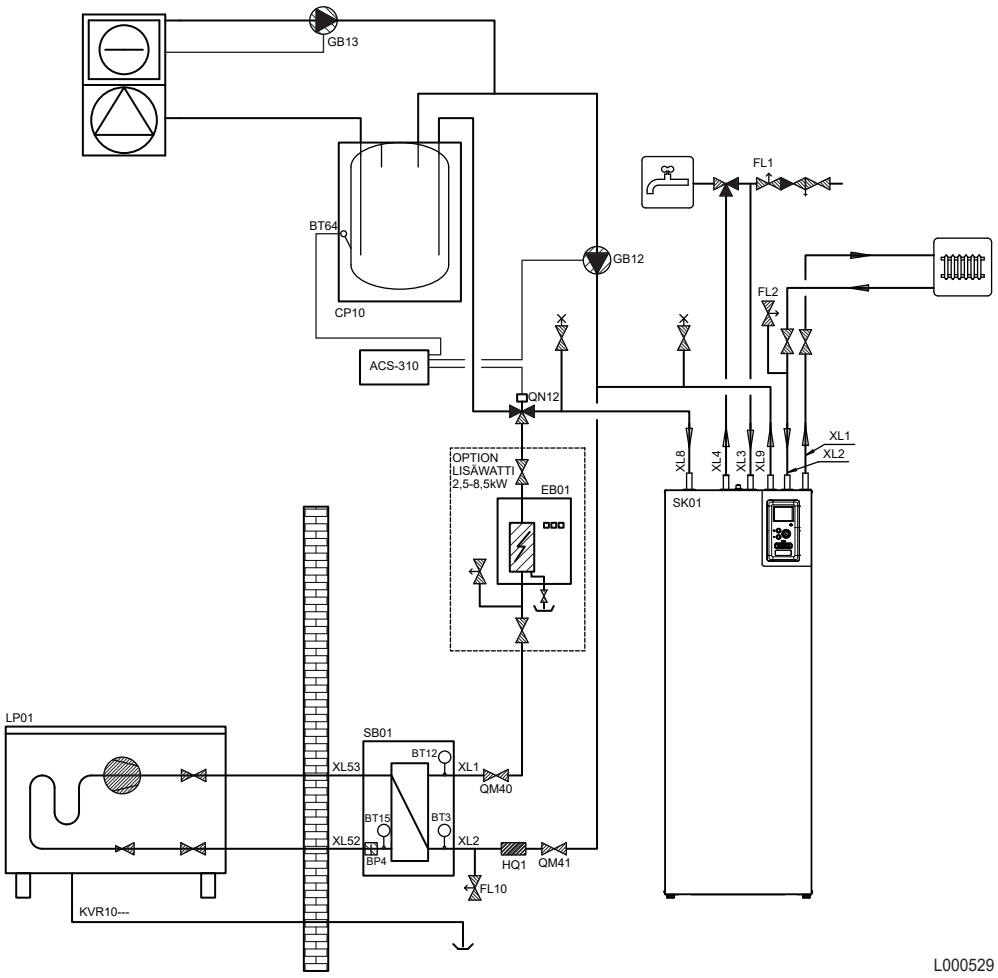
SPLITBOX	*SPLITBOX 6*	*SPLITBOX 8-12*	*SPLITBOX 8-12*	*SPLITBOX 16*
Compatible outdoor module	SPLIT 6	SPLIT 8	SPLIT 12	SPLIT 16
Requirements				
Max pressure, climate system	0,6 MPa (6 Bar)			
Highest recommended supply/return temperature at dimensioned outdoor temperature	55 / 45 °C			
Max flow line temperature with compressor	58 °C			
Min supply temperature cooling, SPLITBOX	7 °C			
Max supply temperature cooling	25 °C			
Min flow, climate system, 100 % circulation pump speed (defrosting flow)	0,19 l/s	0,19 l/s	0,29 l/s	0,39 l/s
Recommendations				
Min volume, climate system during heating, cooling*	20 l	50 l	80 l	150 l
Min volume, climate system during under floor cooling*	50 l	80 l	100 l	150 l
Max flow, climate system	0,29 l/s	0,38 l/s	0,57 l/s	0,79 l/s
Min flow, heating system	0,09 l/s	0,12 l/s	0,15 l/s	0,24 l/s
Min flow, cooling system	0,11 l/s	0,16 l/s	0,20 l/s	0,32 l/s

* Refers to circulating volume.

SYMBOL KEY

Symbol	*Meaning*
	Vent valve
	Shut-off valve
	Non-return valve
	Control valve
	Safety valve
	Temperature sensor
	Expansion vessel
	Pressure gauge
	Circulation pump
	Shunt/reversing valve
	Fan
	Domestic hot water
	Radiator system
	Floor heating system

SPLIT outdoor module docked with SPLITBOX and Tehowatti Air (variable condensation)



NOTE

This is the principle diagram. The equipment must be designed in accordance with the current regulations.

EXPLANATION

SK01	*Indoor module Tehowatti Air*
SB01	SPLITBOX
BP4	Pressure sensor, condenser
BT3	Temperature sensor, heating water, return
BT12	Temperature sensor, condenser, flow
BT15	Temperature sensor, domestic water
LP01	Split outdoor module
EB01	Lisäwatti electric boiler
FL10	Safety valve, heat pump
QM41	Shut-off valve
HQ1	Filter ball valve
XL1	Connection, heating medium, flow 1
XL2	Connection, heating medium, return 1
XL52	Connection, gas line
XL53	Connection, liquid line
EQ1	Active cooling module ACS 310
AA25	Control unit
BT64	Temperature sensor, cooling supply line
CP10	Single jacket accumulator tank, cooling
GP12	Charging pump
GP13	Circulation pump, cooling
QN12	Reversing valve, cooling/heating

5 Electrical connections

General

Outdoor module and SPLITBOX do not include an omnipolar circuit breaker on the incoming power supply. Its supply cables must therefore each be connected to their own circuit breaker with a breaking gap of at least 3 mm. Incoming supply must be 230V ~50Hz via electrical distribution board with fuses.

- Disconnect the SPLITBOX and outdoor module before insulation testing the house wiring.
- For fuse ratings, see technical data, “Fuse protection”.
- If the building is equipped with an earth-fault breaker, outdoor module should be equipped with a separate one.
- Connection must not be carried out without the permission of the electricity supplier and under the supervision of a qualified electrician.
- Cables must be routed so that they are not damaged by metal edges or trapped by panels.
- Outdoor module is equipped with a single phase compressor. This means that one of the phases will be loaded with a number of amperes (A) during compressor operation. Check the maximum load in the table below.

Outdoor module	*Maximum current (A)*
Split 6	15
Split 8	16
Split 12	23
Split 16	25

- Maximum permitted phase loading can be restricted to a lower maximum current in the indoor module or control 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.

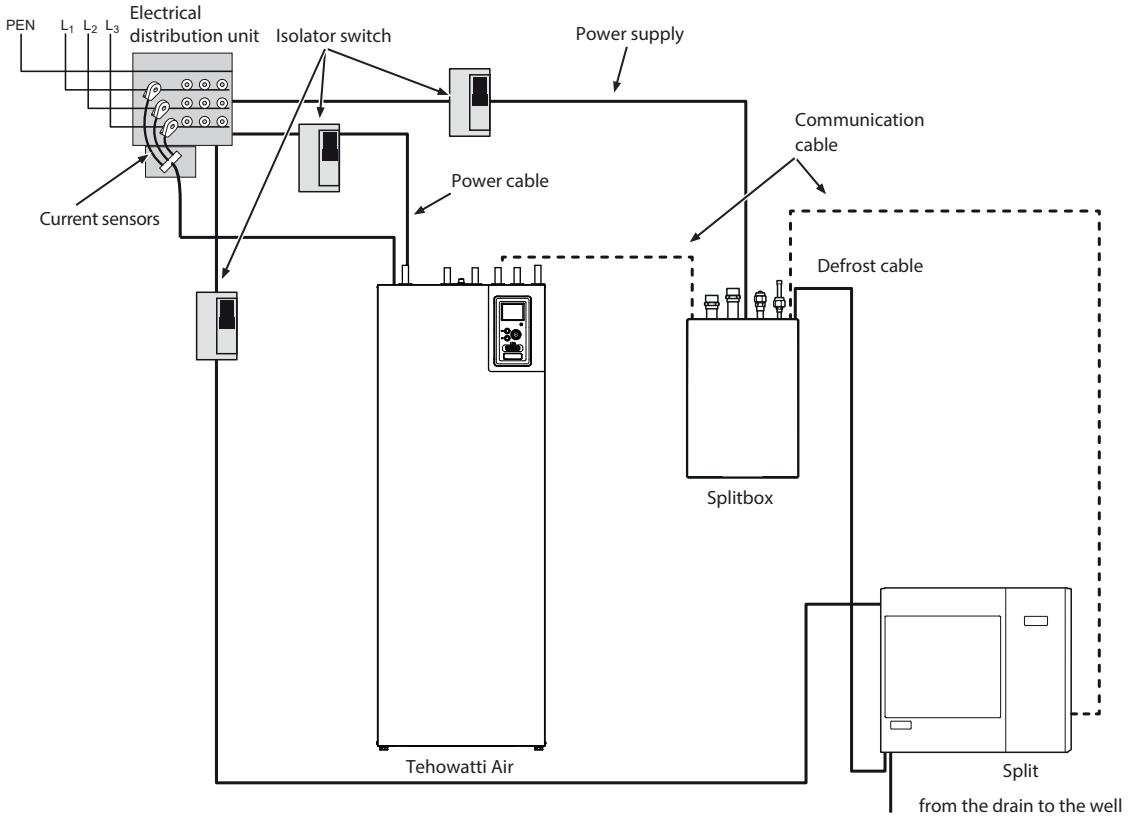
NOTE

When connecting, you must take into account the voltage external control.

NOTE

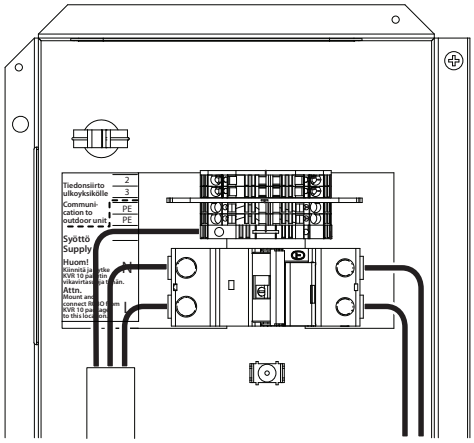
If the supply cable is damaged, it may only be replaced by KAUKORA, the manufacturer's service representative or a similarly qualified professional in order to avoid danger.

PRINCIPLE DIAGRAM, ELECTRICAL INSTALLATION



Installation of residual current protection

The supply of the SPLITBOX is connected via the fault current protection that came with the KVR 10 package. The electrician installs the RCD at the marked location and connects the input cable and outgoing wires (separate black and blue wire) to the RCD as shown. Supply L is connected to the 1/2 connector of the residual current protection and supply N to the N connector of the residual current protection. The protective earthing of the supply is connected to the adjacent PE connector. Correctly installing the residual current protection is important for safety and the proper functioning of the equipment.



Commissioning

Check that the fault current protection that came with the KVR 10 package is installed in the SPLITBOX according to the instructions.

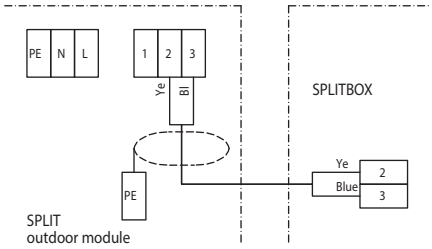
Accessibility, electrical connection

REMOVING THE COVERS

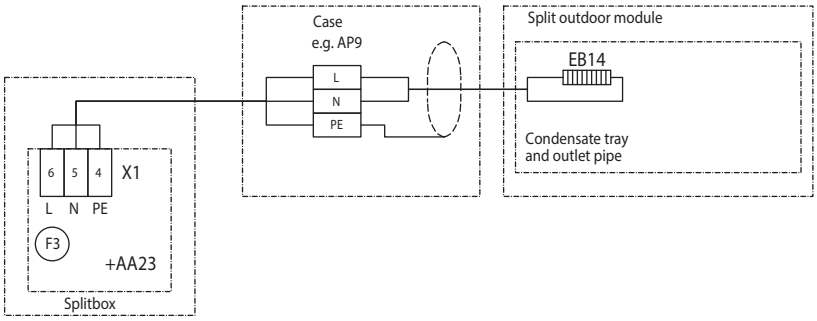
See chapter Removing the covers on page 17.

Connection between SPLITBOX and Split outdoor module

A data communication cable and a defrost cable are connected between the SPLITBOX and the SPLIT outdoor unit.
The communication cable is connected to SPLITBOX connectors X1:2 and X1:3. An interference-protected cable must be used for cabling, e.g. KLMA 2 x 0.8 + 0.8 mm². In the SPLIT outdoor unit, the data transmission cable is connected to the data transmission connectors 2 and 3, respectively, as shown in the figure below. The interference protection of the cable is connected to the grounding point on the body of the outdoor unit.



The supply cable for the external heating cable (KVR 10) is connected to terminals X1:4 (PE), X1:5 (N) and X1:6 (L) of the SPLITBOX circuit board AA23. For example, MMJ 3 x 1.5S can be used as a cable. The supply is cabled outside and a connection box is placed in the immediate vicinity of the SPLIT outdoor unit, where the supply cable of the external heating cable is connected to the actual heating cable. Below is a picture of an example implementation.

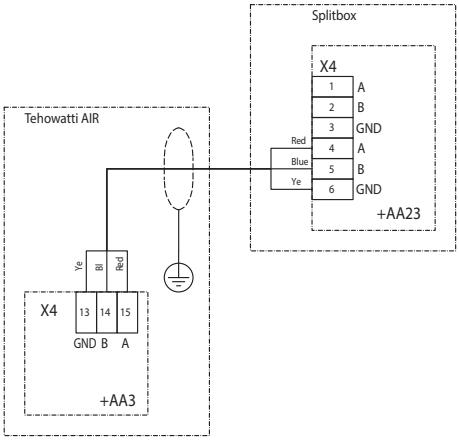


Connection between SPLITBOX and indoor unit Tehowatti AIR

SPLITBOX must be connected to the control module with a communication cable. For example, Tehowatti AIR or MCU 40 can act as a control unit. The communication cable between the SPLITBOX and the control unit must be an interference-protected cable, for example KLMA 4 x 0.8 + 0.8 mm2. In the SPLITBOX, the data transmission cable is connected to AA23 card connectors X4:4 (A), X4:5 (B) and X4:6 (GND).

When the control unit is Tehowatti AIR, connect the communication cable to the AA3 board connectors X4:15 (A), X4:14 (B) and X4:13 (GND) as shown in the picture below. The interference protection of the cable is connected only at the Tehowatti AIR end.

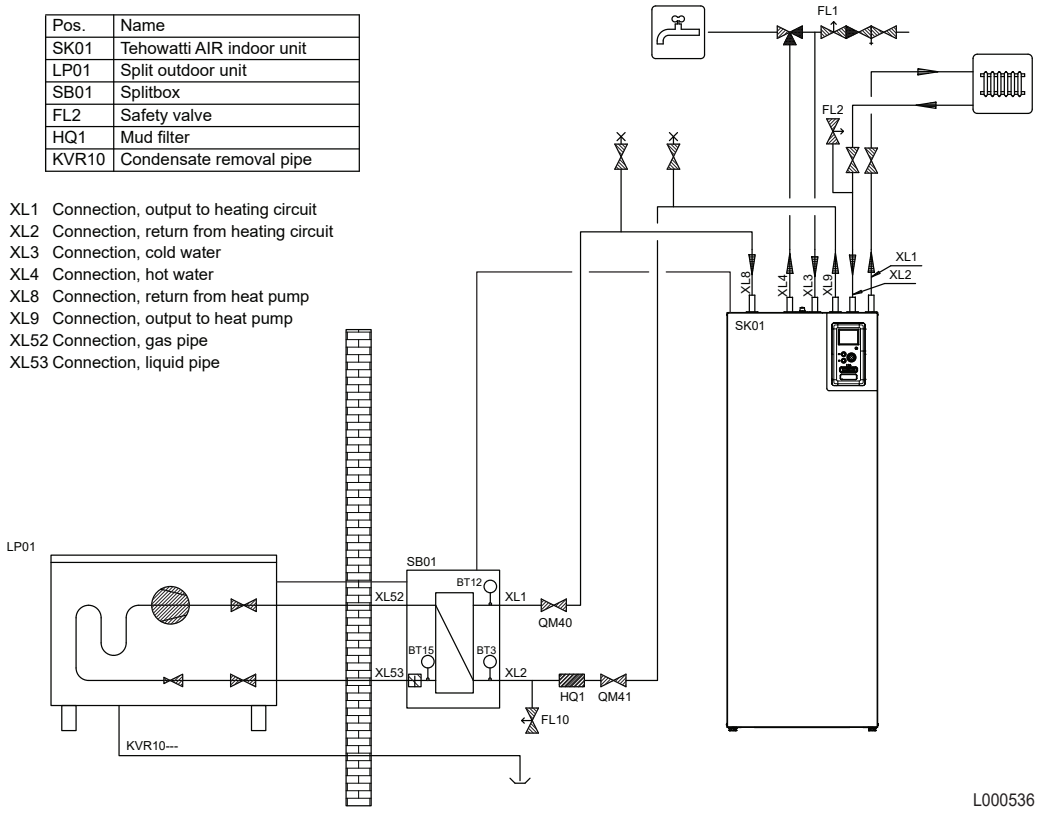
SPLITBOX can communicate with the indoor unit by connecting the indoor unit to terminal block X4:1–3 as shown in the following figure:



Connection between SPLIT outdoor module and Tehowatti Air indoor unit

Pos.	Name
SK01	Tehowatti AIR indoor unit
LP01	Split outdoor unit
SB01	Splitbox
FL2	Safety valve
HQ1	Mud filter
KVR10	Condensate removal pipe

XL1 Connection, output to heating circuit
XL2 Connection, return from heating circuit
XL3 Connection, cold water
XL4 Connection, hot water
XL8 Connection, return from heat pump
XL9 Connection, output to heat pump
XL52 Connection, gas pipe
XL53 Connection, liquid pipe



NOTE

When installing SPLIT 6, the indoor unit must have the correct software version. Make sure the software version of the indoor unit is at least v8320 in this case.

Connection between SPLITBOX and MCU40

NOTE

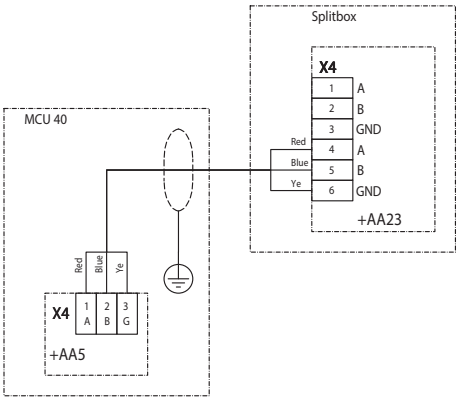
The communication of the outdoor unit must not be connected here, only the SPLITBOX communication must be connected to connector AA23-X4.

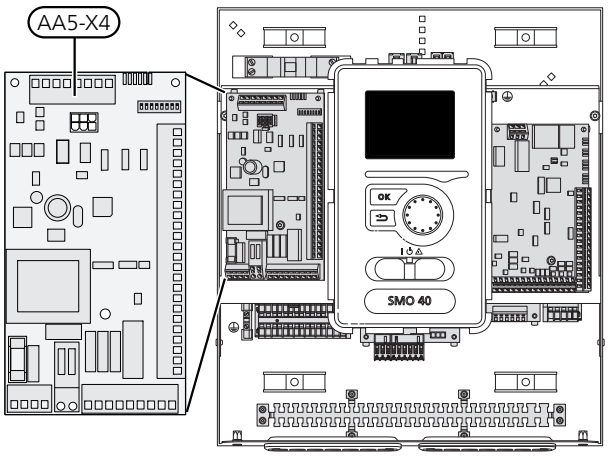
NOTE

When installing SPLIT 6, the control module must have the correct software version. Make sure the software version of the control module is at least v8320 in this case.

Connecting SPLITBOX to the control unit

When the control unit is MCU 40, connect the communication cable to the connectors X4:1 (A), X4:2 (B) and X4:3 (GND) of the board AA5 as shown in the picture below. The interference protection of the cable is connected at the MCU 40 end.





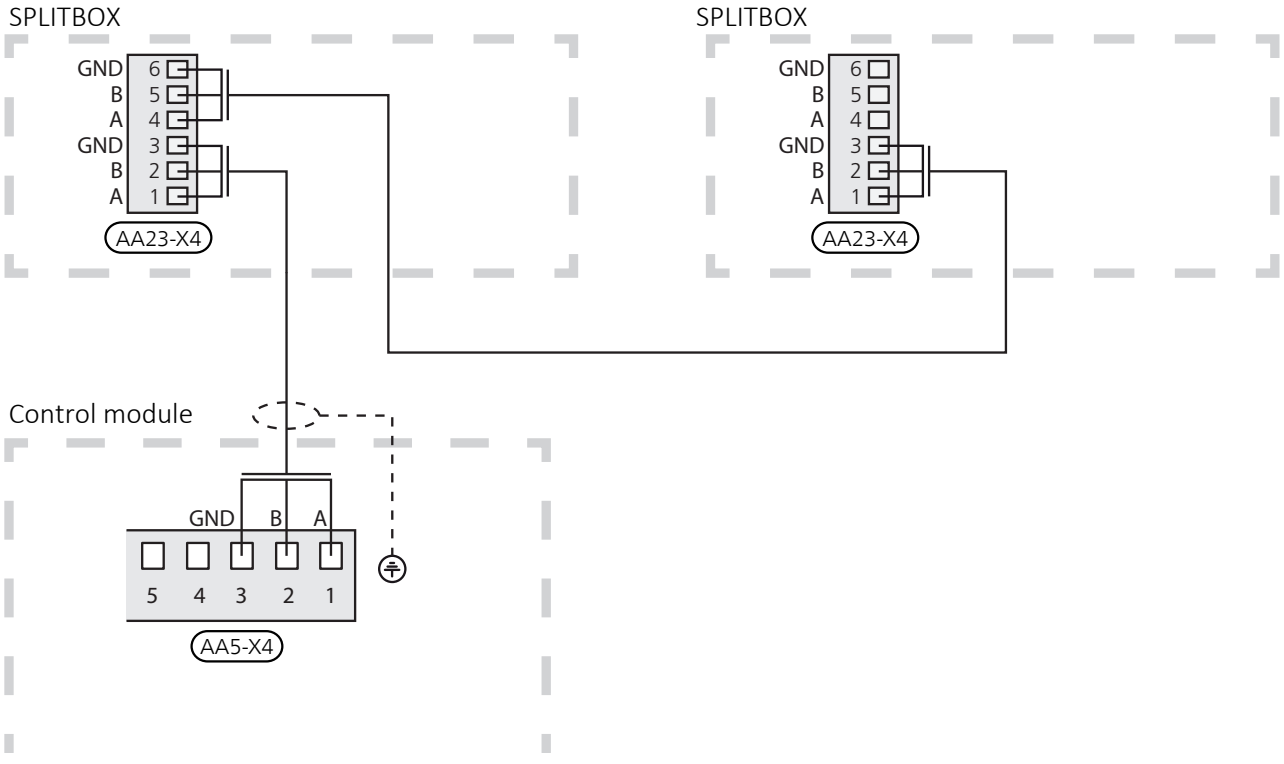
MCU40 and several SPLITBOXes

SPLITBOX (one or several) can communicate with the control unit (MCU 40) when MCU 40, AA5:X4-1(A), -2 (B), -3 (GND), the terminal strips are connected as shown in the following figure:

ADDRESSING VIA CASCADE CONNECTION

On the communication board (AA23-S3) in SPLITBOX the communication address is selected for outdoor module. The default address for outdoor module is **1**. In a cascade connection all outdoor modules 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



Connections

EXTERNAL HEATING CABLE KVR 10 (ACCESSORY)

SPLITBOX is equipped with a terminal block for external heating cable (EB14, not enclosed). The connection is fused for a 3-metre cable length with 250 mA (F3 on communication board AA23). If a different cable length is to be used, the fuse must be replaced as given in the table.

NOTE

A self-regulating heating cable must not be connected.

Length (m)	*Total power (W)*	*Fuse (F3)*	*Part no. Fuse*
1	15	T100mA/250V	718 085
3	45	T250mA/250V	518 900*
6	90	T500mA/250V	718 086

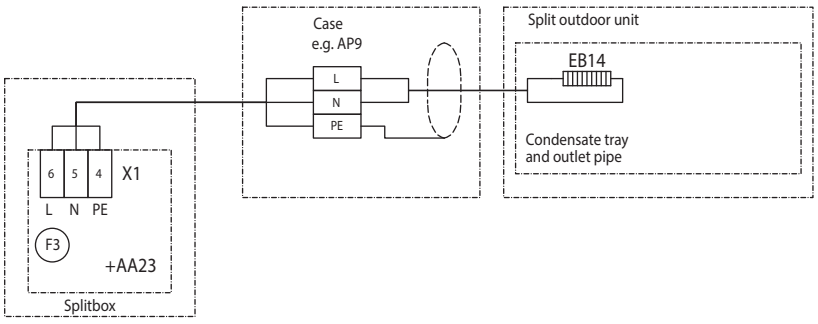
*Fitted at the factory.

Connect external heating cable (EB14) to terminal block AA23-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. See instructions in the Installer Manual for KVR 10.



Connecting accessories

Instructions for connecting accessories are in the installation instructions provided for the respective accessory. See page 43 for the list of the accessories that can be used with SPLITBOX.

6 Commissioning and adjusting

Preparations

- Check that the refrigerant pipe is tightly connected between the outdoor unit and SPLITBOX.
- Check that the service valves (QM35 and QM36) are open.
- Before commissioning, check that the charge circuit and climate system are filled and well vented.
- Check the pipe system for leaks.
- Check that outdoor unit and SPLITBOX are electrically connected and the signal cable between them is connected.

FILLING THE CLIMATE SYSTEM

1. The heating medium system is filled with water to the required pressure.
2. Vent the system using the installed venting nipple and any circulation pump.

VENTING THE CLIMATE SYSTEM

See chapter "Commissioning and adjustment" in the Installer Manual for the indoor module / control module.

COMPRESSOR HEATER

The outdoor unit is equipped with a compressor heater (CH), which heats the compressor before starting and when the compressor is cold. (not applicable to SPLIT 6.)

Start-up and inspection

NOTE

The compressor heater (CH) must run for at least 6 to 8 hours before the compressor can be started. This is ensured by connecting the control voltage and disconnecting the communication cable.

1. Outdoor module must be addressed if it is to have an address other than 1. See chapter Addressing via cascade connection on page 30.
2. The communication cable on the terminal block (AA23-X4) must be connected.
3. Turn the isolator switch on.
4. Ensure that the outdoor module is connected to the power source.
5. After 6 – 8 hours, the communication cable is connected to the connector strip (AA23-X4).
6. Start any indoor module / control module. Follow the instructions for "Start-up and inspection" in the Installer Manual for the indoor module / control module.

The heat pump starts 30 minutes after the outdoor module is powered and the communication cable is connected, if necessary.

If scheduled silent operationis required, it must be scheduled in the indoor module or the control module.

NOTE

Do not start outdoor module at outdoor air temperatures of -20 C or less.

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.

Inspection of the installation

Current regulations require the climate unit to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person and must be documented. Use the checklist on page 8. The above applies to closed climate systems.

Do not replace any part of the system JÄSPI SPLIT without carrying out new checks.

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 can be found in the Installer Manual for the respective indoor module / control module. See page Accessories for the list of the indoor modules, control modules and accessories that can be connected to SPLITBOX.

7 Control – Heat pump EB101

Heat pump menu

5.11.1.1

These settings are made on the display on the indoor module TW Air/control module MCU 40.

Cooling permitted

Here you set whether the cooling function is activated in the heat pump.

Silent mode permitted

This is where the silent mode of the heat pump is set.

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

Here you can select the frequency range in which the heat pump must not operate.

blockFreq 2

Here you can select the frequency range in which the heat pump must not operate.

8 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 SPLITBOX 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.

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 / control module. Follow the instructions on the display on the indoor module / control module.

SPLITBOX not in operation

SPLITBOX communicates all alarms to the indoor module/ control module.

- Ensure that the modules are connected to the power source.
- Check the indoor module or control module. See the corresponding section "Disturbances in comfort" in the Installer Manual for the indoor module or control module.

SPLITBOX does not communicate

- Check that the addressing of SPLITBOX 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 is connected.
- Group and main fuses of the accommodation.
- The property's earth circuit breaker.
- Automatic personal protection (FB1) in SPLITBOX. (Only if KVR 10 is installed.)
- Check the indoor module or control module. See the corresponding section "Disturbances in comfort" in the Installer Manual for the indoor module or control module.

LOW HOT WATER TEMPERATURE OR A LACK OF HOT WATER

> *Caution*
>
> The hot water is always set on the indoor module or the control module.

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.
- 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 THE OUTDOOR MODULE

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

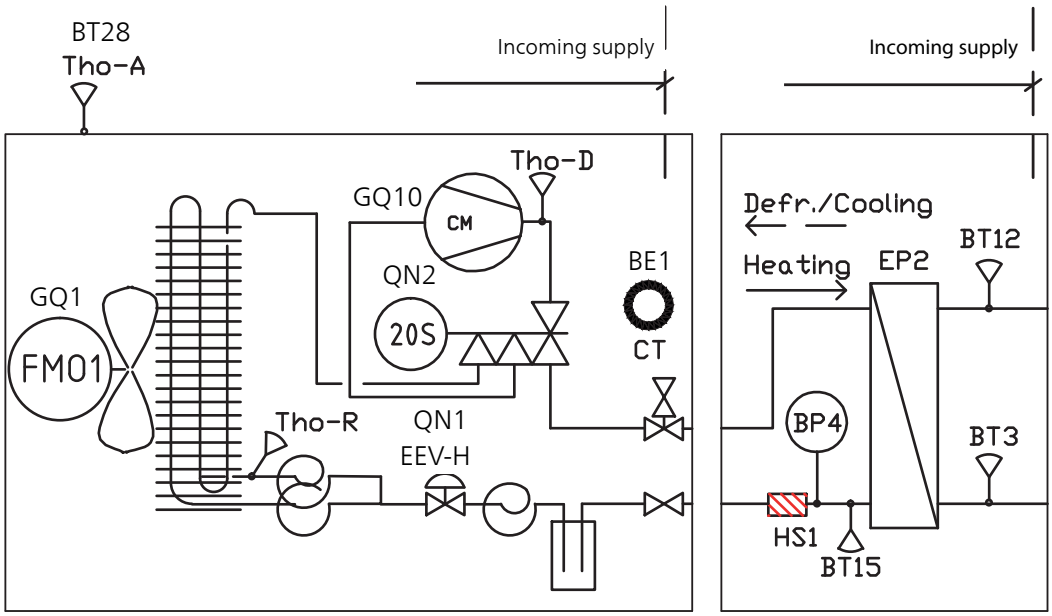
SENSOR PLACEMENT

Positioning the temperature sensor

SPLIT 6 + SPLITBOX 6

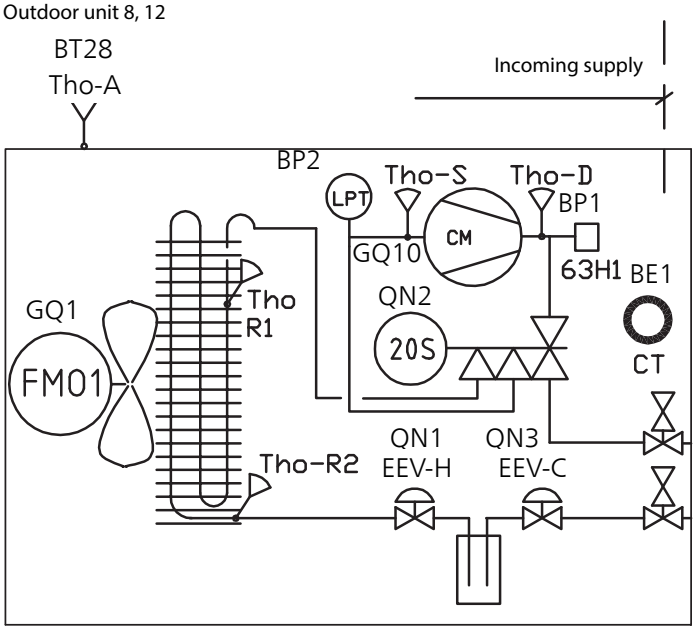
Explanation

BE1 (CT)	Current sensor
BT3	Temperature sensor, heating medium, return
BT12	Temperature sensor, condenser out
BT15	Temperature sensor, DHW
BT28 (Tho-A)	Temperature sensor, outdoor air
BP1 (63H1)	Overpressure regulator
BP2 (LPT)	Temperature sensor, low pressure
BP4	Temperature sensor, high pressure
EP2	Condenser
GQ1 (FM01)	Fan
GQ2 (FM02)	Fan
GQ10 (CM)	Compressor
HS1	Drying filter
QN1 (EEV-H)	Expansion valve, heating
QN2 (20S)	4-way valve
QN3 (EEV-C)	Expansion valve, cooling
Tho-D	Temperature sensor, hot gas
Tho-R	Temperature sensor, heat exchanger, in
Tho-R1	Temperature sensor, heat exchanger, out
Tho-R2	Temperature sensor, heat exchanger, in
Tho-S	Temperature sensor, suction/intake gas

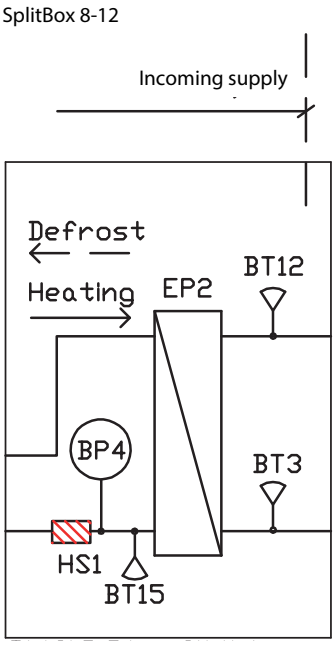


SPLIT 8, 12, 16 + SPLITBOX 8-12, 16

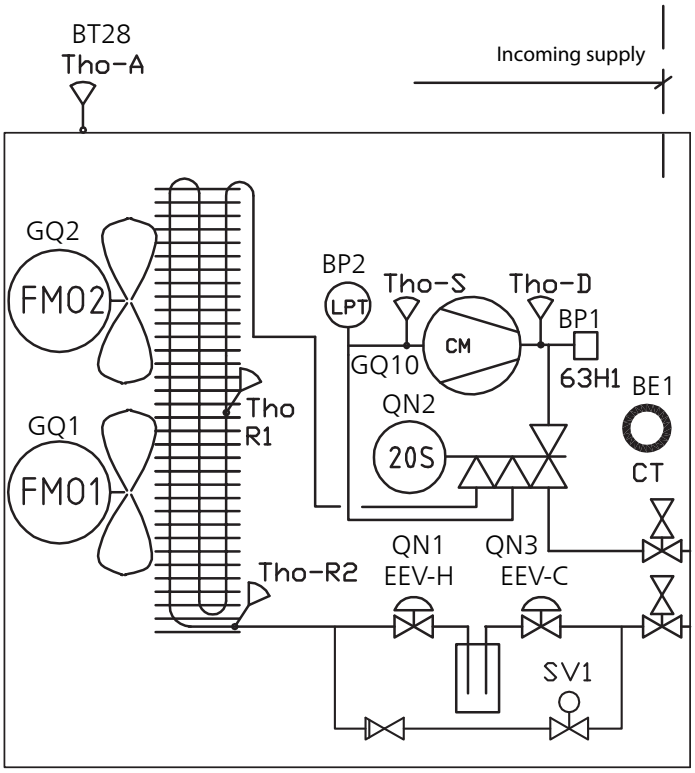
Outdoor unit 8, 12



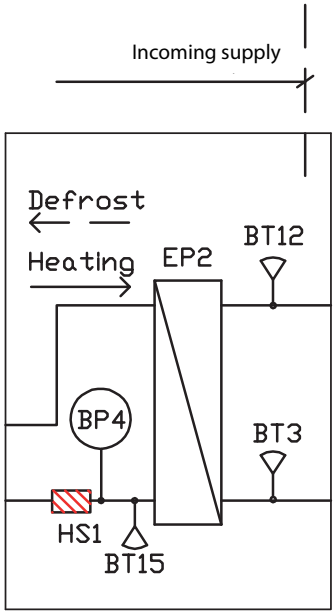
SplitBox 8-12



Outdoor unit 16

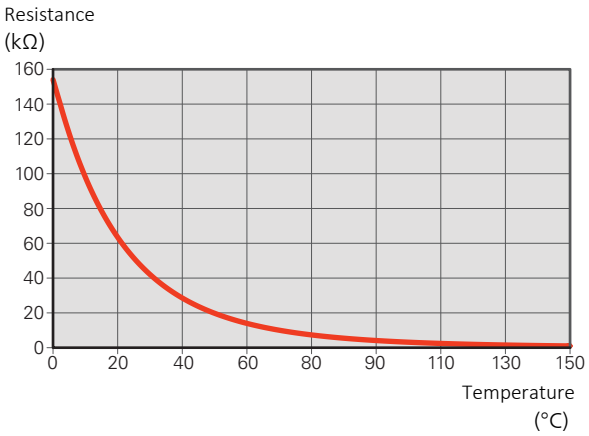


SplitBox 16

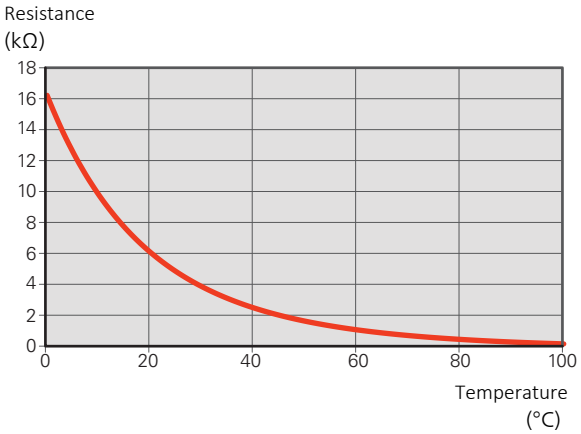


Data for sensor in in SPLIT 6

Tho-D

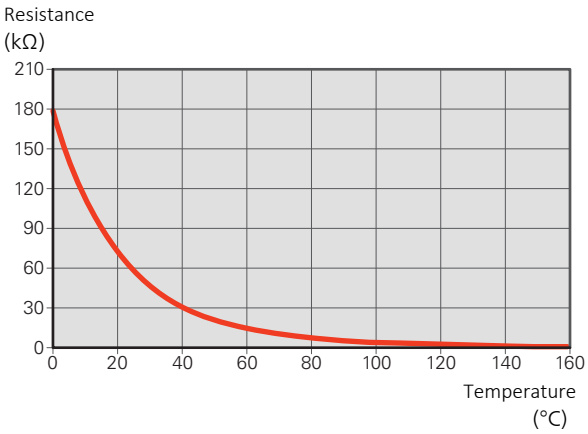


Tho-A, R

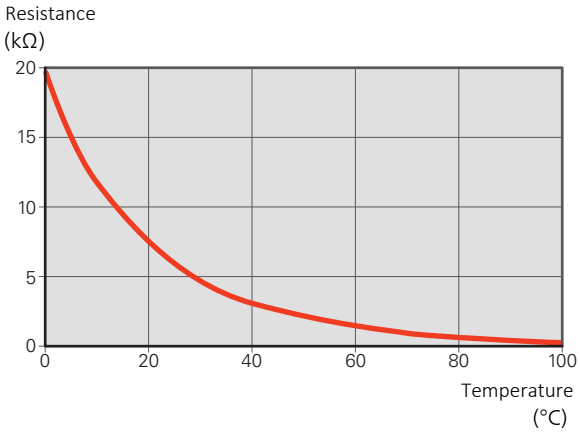


Data for sensor in SPLIT 8, 12, 16

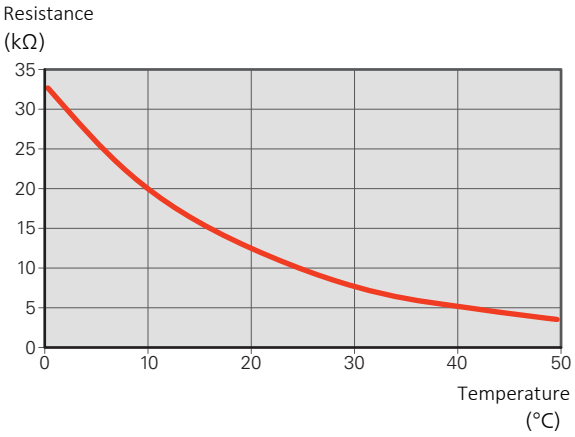
Tho-D



Tho-S, Tho-R1, Tho-R2



BT28 (Tho-A)



Data for return temperature sensor (BT3), condenser 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

9 Alarm list

Alarms	*Alarm text on the display*	*Description*	*May be due to*
3	Sensor fault BT3	Sensor fault, Sensor incoming water in SplitBox (BT3).	• Open circuit or short circuit on sensor input • Sensor doesn't work (see "Troubleshooting") • Defective control board AA23
12	Sensor fault BT12	Sensor fault, Sensor outgoing water in SplitBox (BT12).	• Open circuit or short circuit on sensor input • Sensor doesn't work ("Disturbances in comfort") • Defective control board AA23
15	Sensor fault BT15	Sensor fault, liquid pipe sensor in SplitBox (BT15).	• Open circuit or short circuit on sensor input • Sensor doesn't work ("Disturbances in comfort") • Defective control board AA23
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 pressostat (63H1) has tripped 5 times within 60 minutes or continuously for 60 minutes.	• Insufficient air circulation or blocked heat exchanger • Break or short circuit at the input of the high-pressure pressostat (63H1). • Defective high pressure pressostat • Expansion valve is not connected correctly • Service valve closed • Defective control card in the outdoor unit • Low flow or no flow in heating mode • Defective circulating water pump • Defective fuse, F(4A)
221	LP-ALARM	Low pressure sensor (LPT) reading too low 3 times within 60 minutes.	• Break or short circuit at the input of the low pressure sensor • Defective low pressure sensor (LPT) • Defective control card in the outdoor unit • Break or short circuit at the intake gas sensor (Tho-S) input • Defective intake gas sensor (Tho-S)
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).	• Possible safety switch disconnected • Incorrect cable routing

Alarms	*Alarm text on the display*	*Description*	*May be due to*
224	Fan alarm	Deviations in the fan speed in the outdoor unit.	• The fan cannot rotate freely • Defective control board in the outdoor unit • Defective fan motor • Dirty control board in the outdoor unit • Fuse (F2) blown
230	Continuously high hot gas	Temperature deviation on the discharge sensor (Tho-D) twice within 60 minutes or for 60 minutes continuously.	• Sensor does not work. (An ambient temperature sensor BT28 (Tho-A) is located on the rear of outdoor unit) • 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 the outdoor unit
254	Communication error	Communication fault with accessory board	• Outdoor unit not powered • Fault in the communication cable
261	High temperature in heat exchanger	Temperature deviation on the heat exchanger sensor (Tho-R/R2) five times within 60 minutes or for 60 minutes continuously.	• Sensor doesn't work ("Disturbances in comfort") • Insufficient air circulation or blocked heat exchanger • Defective control board in the outdoor unit • 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 outdoor unit
264	IInverter error	Communication between circuit board for inverter and control board broken.	• Open circuit in connection between boards • Defective circuit board for inverter in outdoor unit • Defective control board in the outdoor unit
265	Inverter error	Continuous deviation on power transistor for 15 minutes.	• Defective fan motor • Defective circuit board for inverter in outodoor unit
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 outdoor unit • Defective control board • Compressor fault
268	Inverter error	Overcurrent, Inverter A/F module	• Sudden power failure
271	Cold outdoor air	Temperature of BT28 (Tho-A) below the set value that permits operation	• Cold weather conditions • Sensor fault
272	Hot outdoor air	Temperature of BT28 (Tho-A) above the value that permits operation	• Warm weather conditions • Sensor fault
277	Sensor fault Tho-R	Sensor fault, heat exchanger in outdoor unit (Tho-R).	• Open circuit or short circuit on sensor input • Sensor doesn't work ("Disturbances in comfort") • Defective control board
278	Sensor fault Tho-A	Sensor fault, outdoor temperature sensor in outdoor unit BT28 (Tho-A).	• Open circuit or short circuit on sensor input • Sensor doesn't work ("Disturbances in comfort") • Defective control board

Alarms	*Alarm text on the display*	*Description*	*May be due to*
279	Sensor fault Tho-D	Sensor fault, hot gas in outdoor unit (Tho-D).	• Open circuit or short circuit on sensor input • Sensor doesn't work ("Disturbances in comfort") • Defective control board
280	Sensor fault Tho-S	Sensor failt, suction/intake gas in outdoor unit (Tho-S).	• Open circuit or short circuit on sensor input • Sensor doesn't work ("Disturbances in comfort") • Defective control board
281	Sensor fault LPT	Sensor failt, low pressure sensor in outdoor unit	• Open circuit or short circuit on sensor input • Sensor doesn't work ("Disturbances in comfort") • Defective control board • Fault in the refrigerant circuit
294	Non-compatible air/water heat pump	Heat pump and indoor module /control module do not work properly together due to technical parameters.	• Outdoor module and indoor module / control module are not compatible.
404	Sensor fault BP4	Sensor fault, Sensor high pres-sure heating/low pressure cooling in SplitBox (BP4).	Open circuit or short circuit on sensor input Sensor does not work ("Disturbances in comfort") Defective control board AA23 in SplitBox

10 Accessories

Not all accessories are available on all markets.

GROUND STAND

Split 6-12
Part no. T000767

CONDENSATE WATER DISCHARGE PIPE

KVR 10-10

1 metres
Part no. M03215

KVR 10-30

3 metres
Part no. M03216

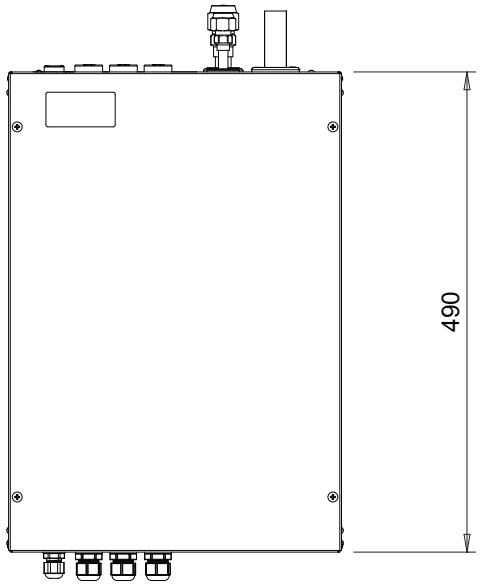
KVR 10-60

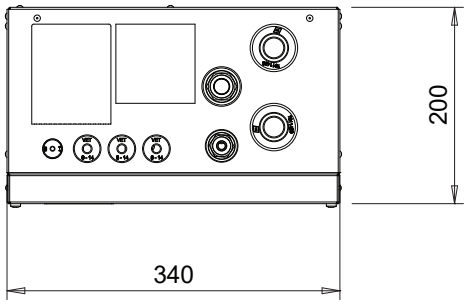
6 metres
Part no. M03217

11 Technical data

Dimensions

SPLITBOX





Technical specifications

CE IP 21

JÄSPI SPLITBOX (SPLIT outdoor module and SPLITBOX)

JÄSPI SPLITBOX (SPLIT outdoor module and SPLITBOX)		
Working range during heating with compressor (ambient temperature)	°C	-20 – +43
Working range during cooling (ambient temperature)	°C	+15 – +43
Max temperature flow line, only compressor	°C	58
Max temperature return line	°C	55
Min temperature flow line during heating with compressor and continuous operation	°C	25
Maximum temperature supply during cooling and continuous operation	°C	25
Min temperature flow line during cooling	°C	7
Incoming voltage supply, maximum permitted deviation	%	-15 % – +10 %
The water quality, domestic hot water and climate system		≤ EU directive no. 98/83/EF

SPLITBOX

SPLIT box		*SPLITBOX 6*	*SPLITBOX 8-12*		*SPLITBOX 16*
Compatible outdoor module		*Split 6*	*Split 8*	*Split 12*	*Split 16*
Electrical data					
Electrical connections		230V ~ 50Hz			
Recommended fuse rating	A_{rms}	6			
Enclosure class		IP 21			
Heating medium circuit					
Max pressure, climate system	MPa (bar)	0,6 (6)			
Max pressure, cooling system	MPa	4,5			
Min/max system flow, heating operation	l/s	0,09 / 0,29	0,12 / 0,38	0,15 / 0,57	0,25 / 0,79
Min/max system flow, cooling operation	l/s	0,11 / 0,29	0,15 /0,38	0,20 / 0,57	0,32 / 0,79
Min flow, climate system, 100 % circulation pump speed (defrosting flow)	l/s	0,19	0,19	0,29	0,39
Volume, total	litraa	1,2 +-5%	3 ±5 %		4 ±5 %
Max operating temperature	°C	65			
Ambient temperature	°C	5 – 35 °C. max relative humidity 95 %			
Pipe size of the hot water circuit		22 mm			28 mm
Dimensions and weight					
Width	mm	340			
Depth	mm	200			
Height, without pipe/with pipe	mm	490 / 550			
Weight	kg	18	18		19,5
Miscellaneous					
Water quality, climate system		≤ EU directive no. 98/83/EF			
Part no.		T000810	T000757		067 536

ENERGY RATING, AVERAGE CLIMATE

Model		*SPLIT 6 SPLITBOX 6*	*SPLIT 8 SPLITBOX 8-12*	*SPLIT 12 SPLITBOX 8-12*	*SPLIT 16 SPLITBOX 16*
Outdoor module model		*Split 6*	*Split 8*	*Split 12*	*Split 16*
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++

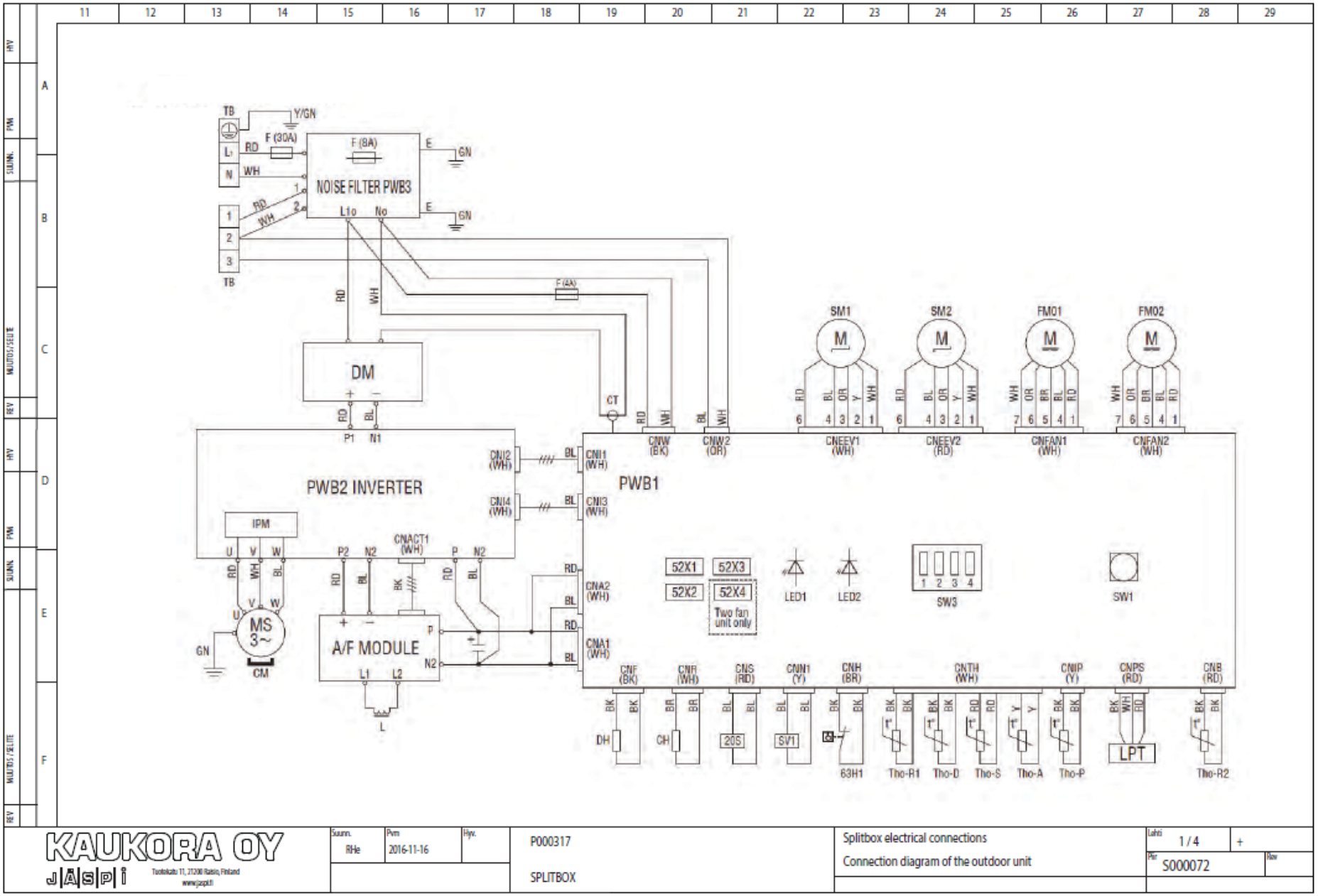
[1]Scale for the product's room heating efficiency class A++ to G.

[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.

Electrical circuit diagram

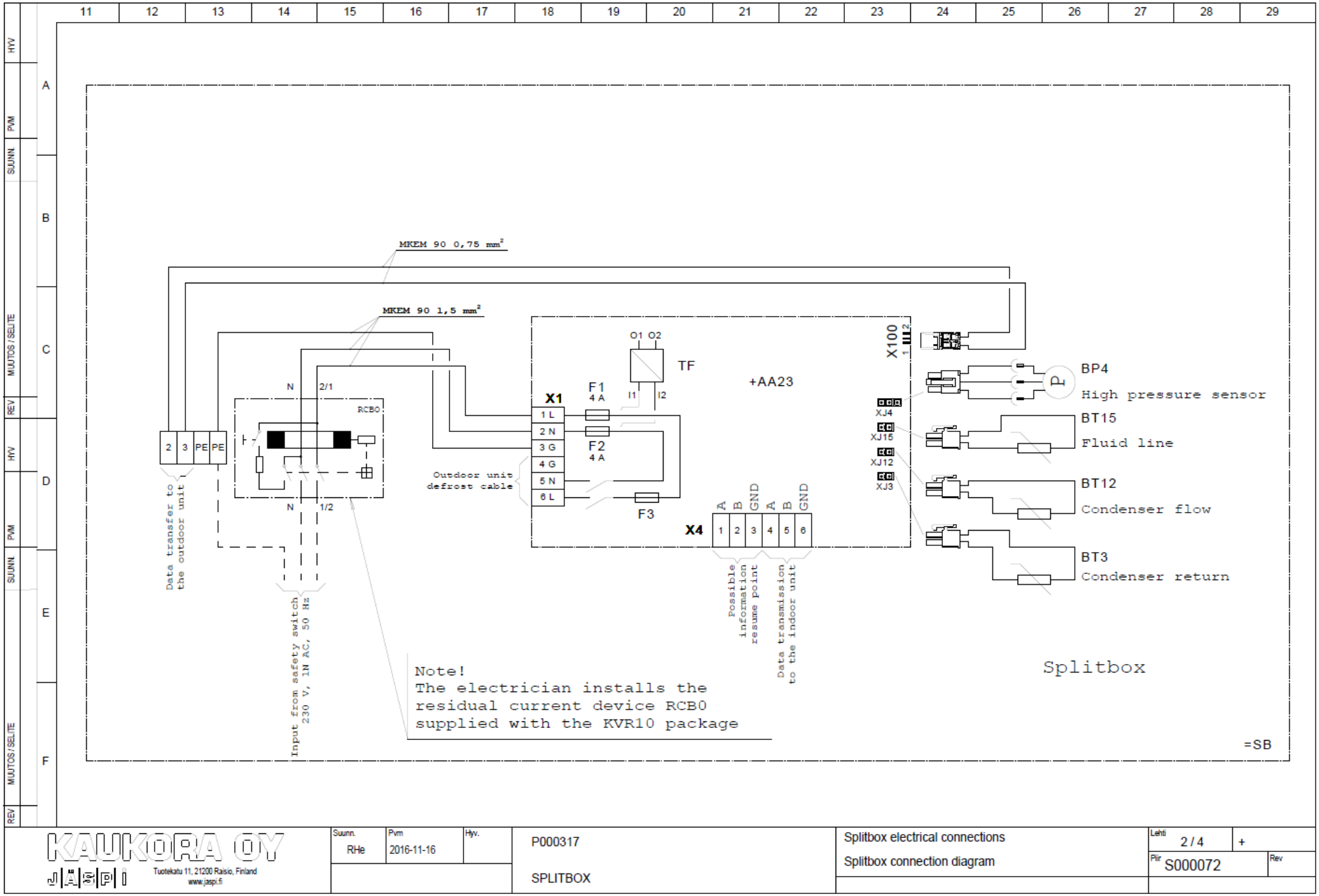
SPLITBOX



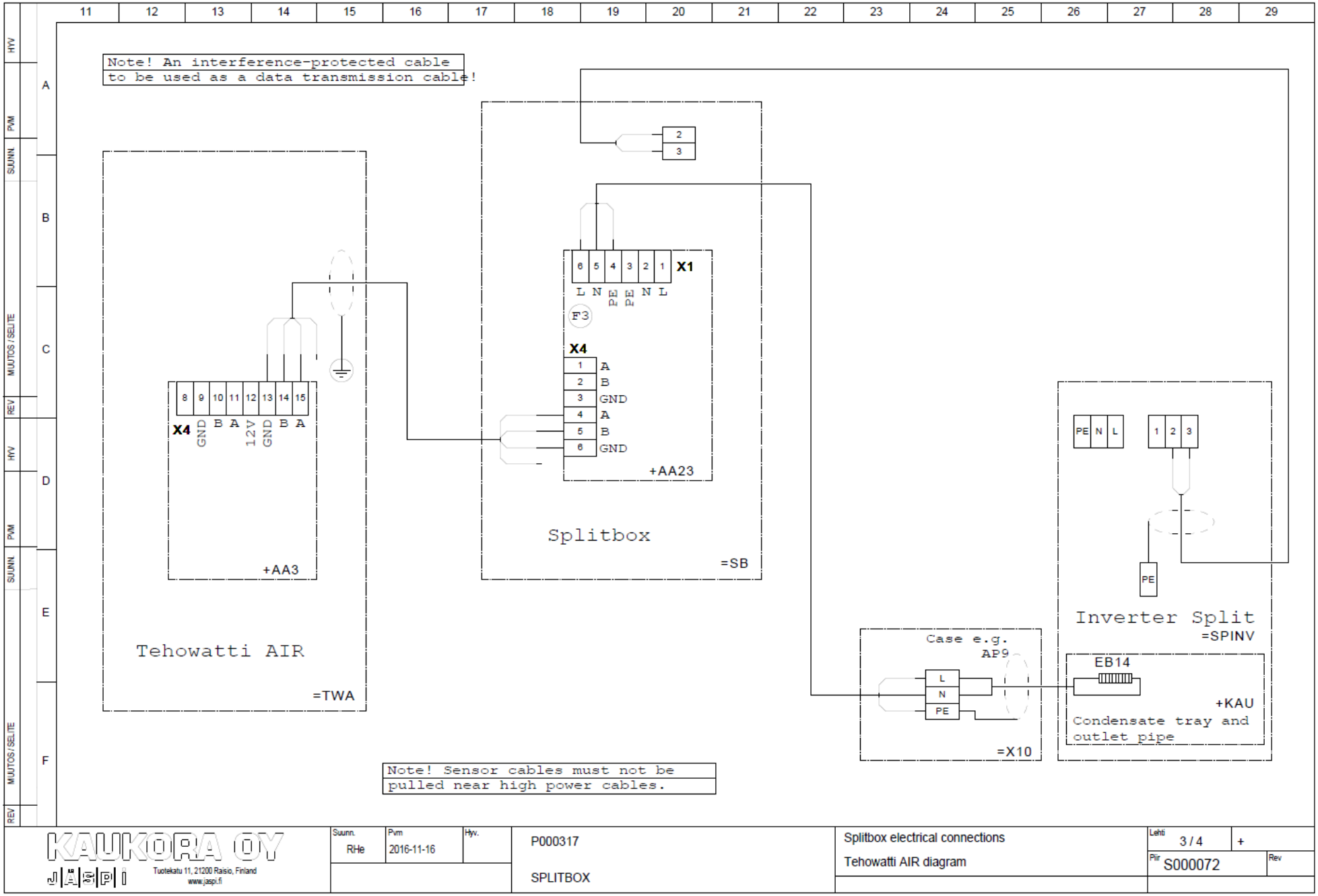
Designation	*Description*
20S	4 way valve solenoid
52X1	Auxiliary relay (for CH)
52X2	Auxiliary relay (for DH)
52X3	Auxiliary relay (for 20S)
52X4	Auxiliary relay (for SV1)
63H1	Overpressure regulator
C1	Condenser
CH	Compressor heater
CM	Compressor motor
CnA~Z	Terminal strip
CT	Power sensor
DH	Gutter heater
DM	Diode module
F	Fuse
FM01, FM02	Fan motor
IPM	Smart power module
L/L1	Induction coil
LED1	Indicator light (red)
LED2	Indicator light (green)
LPT	Low pressure transmitter
QN1 (EEV-H)	Heating expansion valve
QN3 (EEV-C)	Cooling expansion valve
SW1, 9	Refrigerant recovery
SW3, 5, 7, 8	Local settings
TB	Terminal strip
BT28 (Tho-A)	Temperature sensor, outside air
Tho-D	Temperature sensor, hot gas
Tho-R1	Temperature sensor, heat exchanger, flow
Tho-R2	Temperature sensor, heat exchanger, input
Tho-S	Temperature sensor, intake gas
Tho-P	Temperature sensor, IPM

TRANSLATION TABLE

English	*Finnish*
2 times	2 kertaa
4-way valve	4-tieventtiili
Alarm	Hälytys
Alarm output	Hälytyslähtö
Ambience temp	Ulkolämpötilan anturi
Black	musta
Blue	sininen
Brown	ruskea
Charge pump	Latauspumppu
Communication input	Tiedonsiirtotulo
Compressor	Kompressori
Control	Ohjaus
CPU card	CPU-kortti
Crank case heater	Kompressorilämmitin
Drip tray heater	Tippakaukalon lämmitin/Kondenssivesikourun lämmitin
Evaporator temp.	Höyrystin, lämpötilan anturi
External communication	Ulkoinen tiedonsiirto
External heater (Ext. heater)	Ulkoinen lämmitin
Fan	Puhallin
Fan speed	Puhaltimen nopeus
Ferrite	Ferriitti
Fluid line temp.	Nesteputki, lämpötilan anturi
Heating	Lämpö
High pressure pressostat	Ylipaineensäädin
gr/ye (green/yellow)	vihreä/keltainen
Low pressure pressostat	Alipaineensäädin
Next unit	Seuraava yksikkö
Noise filter	Häiriösuodatin
Main supply	Syöttö
On/Off	Päälle/Pois
Option	Lisävarusteet
Previous unit	Edellinen yksikkö
RCBO	Vikavirtasuojakytkin
Red	Punainen
Return line temp.	Paluulämpötilan anturi
Supply line temp.	Menolämpötilan anturi
Supply voltage	Sähkönsyöttö/jännite
Temperature sensor, Hot gas	Lämpötila-anturi, kuumakaasu
Temperature sensor, Suction gas	Lämpötila-anturi, imukaasu
Two fan unit only	Vain kahdella puhaltimella varustetut yksiköt
White	Valkoinen



KAUKORA OY JASPI Tuotekatu 11, 21200 Raisio, Finland www.jaspi.fi	Suunn. RHe	Pvm 2016-11-16	Hyv.	P000317 SPLITBOX	Splitbox electrical connections Splitbox connection diagram
					Lehti 2 / 4 +
					Plr S000072 Rev


Note! An interference-protected cable to be used as a data transmission cable!
2
3
6 5 4 3 2 1 X1
L N PE PE N L
F3
X4
1 A
2 B
3 GND
4 A
5 B
6 GND
+AA23
Splitbox
=SB
8 9 10 11 12 13 14 15
X4
GND B A 12V GND B A
+AA3
Tehowatti AIR
=TWA
PE N L
1 2 3
PE
Inverter Split
=SPINV
Case e.g. AP9
L
N
PE
=X10
EB14
+KAU
Condensate tray and outlet pipe
Note! Sensor cables must not be pulled near high power cables.
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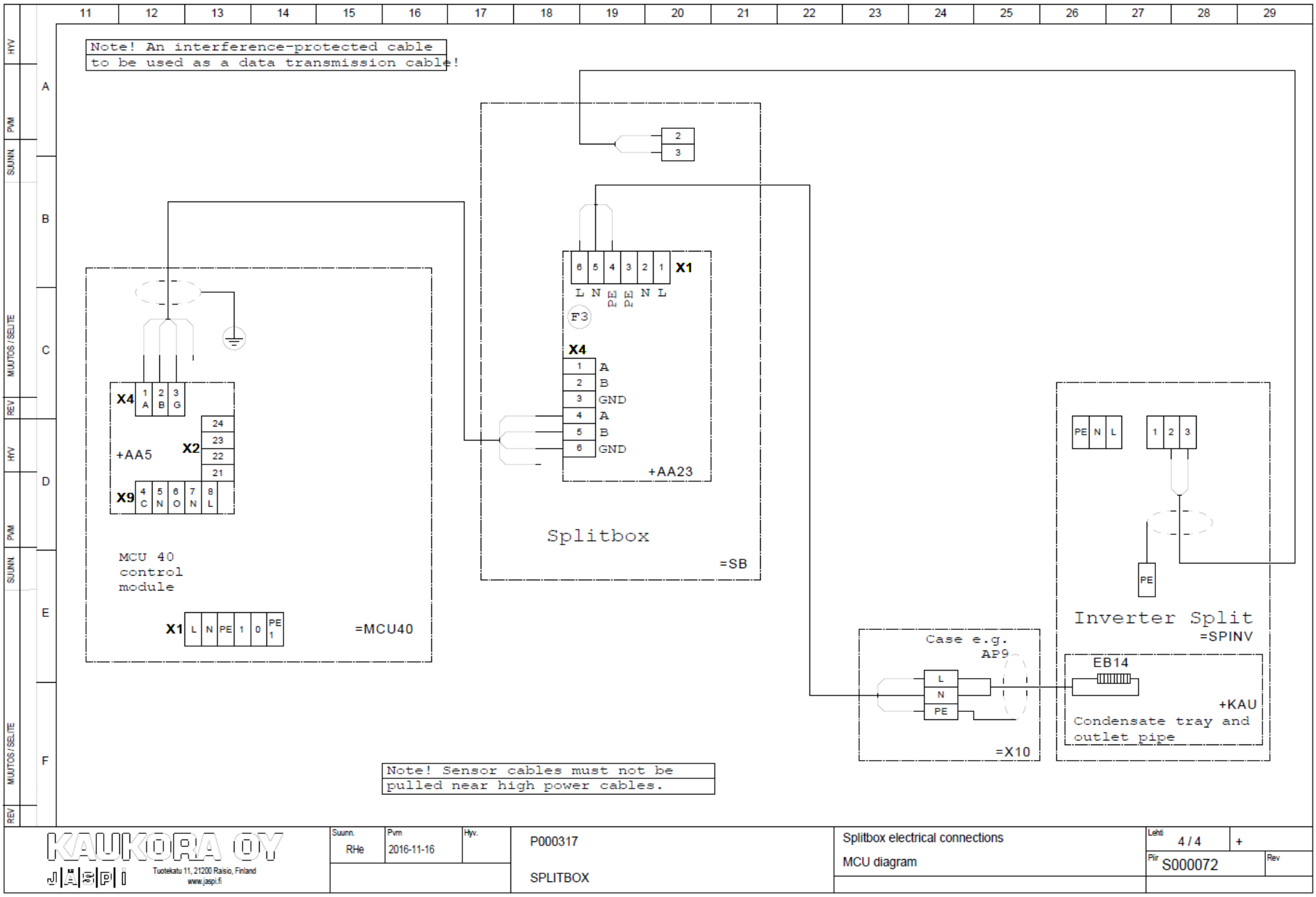
Hyv.
P000317
SPLITBOX
Splitbox electrical connections
Tehowatti AIR diagram
Lehti 3 / 4
Piir S000072
Rev


Note! An interference-protected cable to be used as a data transmission cable!
2
3
6 5 4 3 2 1 X1
L N PE PE N L
F3
X4
1 A
2 B
3 GND
4 A
5 B
6 GND
+AA23
Splitbox
=SB
X4 1 A 2 B 3 G
24
23
22
21
+AA5
X2
X9 4 C 5 N 6 O 7 N 8 L
MCU 40
control
module
X1 L N PE 1 0 PE 1
=MCU40
PE N L
1 2 3
PE
Inverter Split
=SPINV
Case e.g.
AP9
L
N
PE
EB14
+KAU
Condensate tray and
outlet pipe
=X10
Note! Sensor cables must not be pulled near high power cables.
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