Air-to-water heat pump

JÄSPI SPLIT *6,8,12,16*

Contents

1 Important

System solution

The Split outdoor unit is intended for installation together with SplitBox and indoor module Tehowatti Air or control unit MCU 40 for a perfect system solution.

Safety information

This manual presents installation and maintenance procedures, which must be performed by a professional.

The manual must be left with the customer.

This device may be used by people 8 years of age and older as well as people with restricted physical, sensory or mental capacities, or those with insufficient experience or knowledge, provided that they are given instruction and information on the safe use of the device and they understand the risk factors associated with its operation. The product is intended for use by experts or trained users in commercial premises, hotels, light industry, agriculture and similar environments.

Children must be supervised to ensure that they do not play with the device.

Never allow children to clean or service the device without proper instruction.

This is the original manual. It may not be translated without the express consent of Kaukora.

We reserve the right to structural changes.

Symbols

NOTE!

This symbol indicates a hazard to personnel or machinery.

REMEMBER!

This symbol indicates important information, which should be taken into account when installing or servicing devices.

TIP!

This symbol indicates a tip for making product handling easier.

Markings

CE The CE marking is mandatory for most products sold within the EU, regardless of their place of manufacture.

IP21 Enclosure rating for electrotechnical devices. Hazardous to humans or machinery.

Read the operating instructions.

Safety instructions

WARNING

Install the system in full accordance with the instructions given in this installation manual. Improper installation can result in an explosion, accident, water leakage, refrigerant leakage, electrical shock or fire.

Give attention to measurement values when servicing the refrigerant system in confined spaces to ensure that the refrigerant concentration limits are not exceeded.

Contact an expert to help interpret measurement values. If the refrigerant concentration exceeds set values, any leakage could result in oxygen displacement, thus causing a serious accident.

Use original manufacturer accessories and listed components in the installation.
If other parts are used, this can result in water leakage and electrical shock, fire or injury, as the device may not operate properly.

Ventilate the working space effectively - refrigerant may leak while servicing the device.

The refrigerant produces a toxic gas when coming into contact with an open flame.

Install the device on a solid, load-bearing surface.
An improper installation site can result in the device falling, thus causing property damage and injury. Improper installation can also cause vibration and noise problems.

Install the device solidly so that it can withstand earthquakes and storm winds.
An improper installation site can result in the device falling, thus causing property damage and injury.

All electrical installations must be performed by a licensed electrician, and the system must be connected as a separate circuit.

An underdimensioned, faulty power supply can result in electric shock and fire.

Use listed cables for electrical connections, fasten the cables securely into cable terminals and mount the cables properly to avoid any undue stress on the terminals.
A loose terminal or cable clamp can result in overheating or fire.

After installation or servicing, check to ensure that there is no refrigerant gas leaking from the system.
If refrigerant leaks into the household and comes into contact with space heaters, ovens or any other hot surface, it can produce a toxic gas.

Shut off the compressor before opening the refrigerant circuit.

If the refrigerant circuit is opened while the compressor is running, air may get into the process circuit. In this case, the process circuit pressure will rise excessively high, thus possibly resulting in an explosion and injury.

Shut off the power supply while servicing or inspecting the device.
If the power supply is not shut off, there is a risk of injury from electric shock and spinning fan blades.

Never operate the device with the panel or cover removed.
Contact with spinning parts, hot surfaces and live parts can cause injuries resulting from entanglement, burns or electric shock.

Shut off the power supply before performing any electrical work.
If the power supply is not shut off, you may get an electric shock or the device may be damaged, thus malfunctioning.

CAUTION

Make all electrical connections carefully.

Electrical connections must be made by electricians licensed in accordance with all currently applicable legislation. Never connect the ground wire to gas pipes, water pipes, lightning rods or telephone ground wires. Improper grounding can result in device malfunction as well as electric shock caused by a short circuit.

Use a main power switch with sufficient breaking capacity.
If the breaking capacity of a switch is insufficient, it can result in malfunction and fire.

Only use correctly dimensioned fuses (correct trip current) in places requiring fuses.
Connecting a device with copper wire or other metal wire can damage the device and cause a fire.

Cables must be installed so that they do not rub against metal edges or become pinched between panels.

Improper installation can result in electric shock, damage to the device, overheating or fire.

Never install the device in a place where flammable gases can leak. If gas accumulates around the device, it can result in fire.

Never install the device in a place where corrosive gases (e.g. sulfuric acid gases) or flammable gases or vapours (e.g. thinner and petrol fumes) may be produced or accumulate, or where volatile, flammable substances are handled.
Corrosive gases may result in corrosion of the heat exchanger, breakage of plastic parts, etc., and flammable gases and vapours can result in fire.

Never use the device in places with water spray, such as laundries.
The indoor module is not watertight and water can cause an electric shock or fire.

Never use the indoor module for specialised purposes, such as storing food, cooling precision instruments or the cold storage of animals, plants or artwork.
This kind of use can result in property damage.

Never install or use the system near equipment that generates an electromagnetic field or high-frequency overtones.

Inverters, backup power supplies, high-frequency medical equipment and telecommunications equipment can affect the device, resulting in malfunctions and causing damage to it. In addition, the device can interfere with the functioning of medical devices and telecommunications equipment, causing them to malfunction or stop working entirely.

Never install the device in any of the places listed below.

- Places where flammable gases may leak.
- Places where there may be carbon fibres, metal dust or other dust in the air.
- Places where there may be substances that can damage the device, such as sulfide-based gases, chlorine gas, acids or bases.
- Places where the device may be exposed to oil fumes or vapours.
- Vehicles or vessels.
- Places where machines producing high-frequency overtones are used.
- Places where cosmetics or specialised sprays are used frequently.
- Places where the system may be directly exposed to salty air. In this case, the outdoor unit should be covered to prevent direct exposure to salty air.
- Places where there is a large amount of snowfall.
- Places where the system is exposed to smoke.

If the base frame of the outdoor unit is rusty or damaged in some other way after a long service life, it must be taken out of use.

The use of an old, damaged frame can cause the device to fall, thus possibly resulting in injury.

If there is a need to solder close to the device, ensure that the drip tray is damaged by any spatter.
If any spatter gets on the device from soldering, the spatter can eat small holes into the drip tray, thus resulting in water leakage. In order to avoid this, the device should be left in its packaging or covered.

Never place the end of the condensation hose into a pit or well where toxic gases (e.g. gases containing sulfides) may form.
If the end of the hose is in such a pit or well, the toxic gases will flow into the room and can jeopardise the health and safety of the users.

Insulate the device pipes to prevent condensation from forming on them.
Insufficient insulation can cause condensation, thus resulting in moisture damage to the ceiling, floor, furniture and valuables.

Never place the outdoor unit in a place where insects and small animals can build nests inside it.
Insects and small animals may reach the electronic components, thus causing damage or a fire. Advise the customer to keep the area around the device clean.

Be careful when carrying the device by hand.

If the device weighs more than 20 kg, an assistant will be needed to help carry it. Use gloves to prevent cuts.

Dispose of the packaging materials properly.
The packaging materials can cause injury, because nails and wood are used in them.

Never press buttons if your hands are wet.
You can get an electric shock.

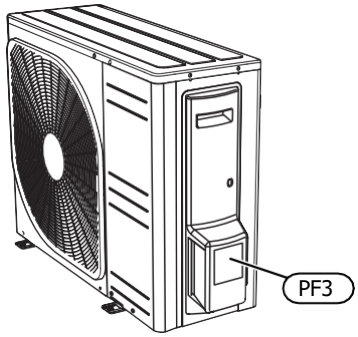
Never touch refrigerant pipes with bare hands when the system is running.
During operation, the pipes may become extremely hot or cold, depending on the device function. Touching pipes can result in burns.

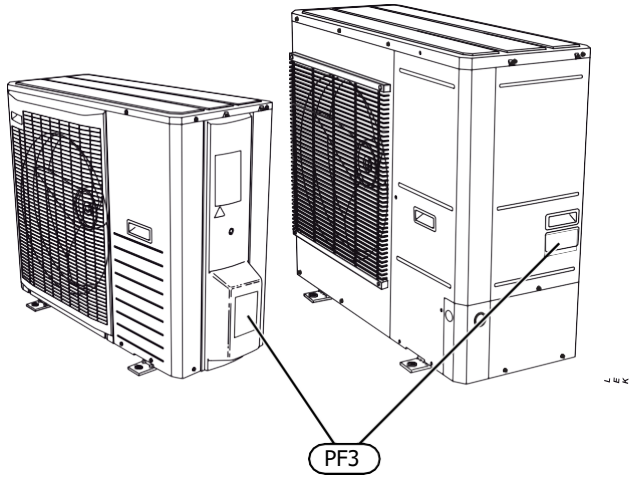
Do not shut off the power supply immediately after the heat pump stops.
Wait at least 5 minutes. Otherwise, a water leak may occur or the device may be damaged.

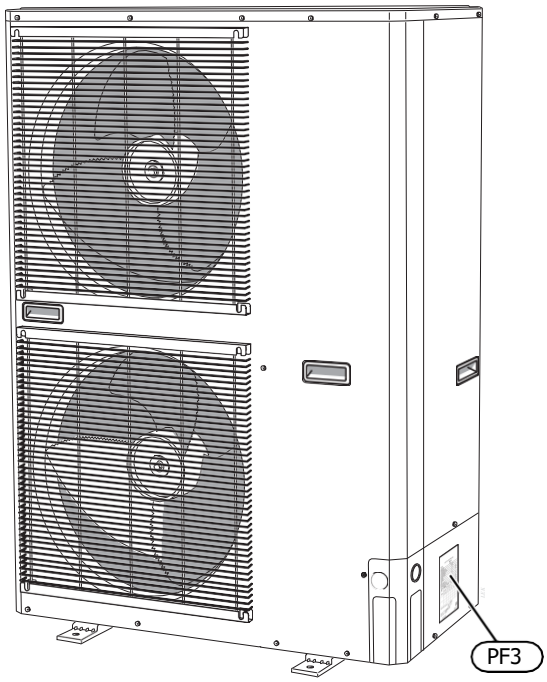
Never shut the system off at the main switch.
This can result in fire or cause a water leak. In addition, the fan can turn on unexpectedly, thus resulting in an accident.

Serial number

The service code and serial number (PF3) are found on the right side of the outdoor unit.







REMEMBER!

You will need the product service code and serial number for maintenance and support.

Recycling

Let the product installer or waste station handle disposal of the packaging.

When the product reaches the end of its service life, it cannot be disposed along with other common household waste. It must be disposed of at a waste station or returned to a dealer offering a disposal service.

Failure to properly dispose of the product will result in the imposing of administrative sanctions on the user in accordance with currently applicable legislation.

Environmental information

This unit contains fluorinated greenhouse gases, which are included in the Kyoto Protocol.

The device contains R410A, a fluorinated greenhouse gas with a GWP (Global Warming Potential) of 2088. Never allow R410A to be released into the air.

Checklist: Pre-commissioning inspection

Refrigerant system	*Remarks*	*Inspected*
Pipe length		☐
Height difference		☐
Pressure test		☐
Leak detection		☐
Final pressure vacuum pumping		☐
Pipe insulation		☐

Electrical installation	*Remarks*	*Inspected*
Main fuse of the property		☐
Group fuse		☐
Pilot switch/current sensor (connected to the indoor module/control unit)		☐
KVR 10		☐
When installing the Split 6, ensure that the software version of the indoor module/control unit is at least v8320.		☐

Cooling	*Remarks*	*Inspected*
Pipes, condensation insulation		☐
		☐

Compatible Tehowatti Air indoor module and MCU40 control unit

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

Tehowatti Air product no. 5858528
MCU 40 product no. T000676

2 Delivery and handling

Transport and storage

The outdoor unit must be transported and stored upright.

> ⚠ *NOTE!*
>
> Ensure that the heat pump cannot tip over during transport.

Installation

- Place the outdoor unit outside on a solid surface that can hold its weight, preferably a concrete floor or pad.

  When using concrete tiles, they must be placed on a gravel or crushed aggregate bed.

- A concrete base or tiles must be placed so that the lower edge of the evaporator will be roughly equal to the average snow depth, but no higher than 300 mm. See pads and consoles on page 36.

- The outdoor unit must not be placed next to walls where noise will be a problem, such as the exterior wall of a bedroom.

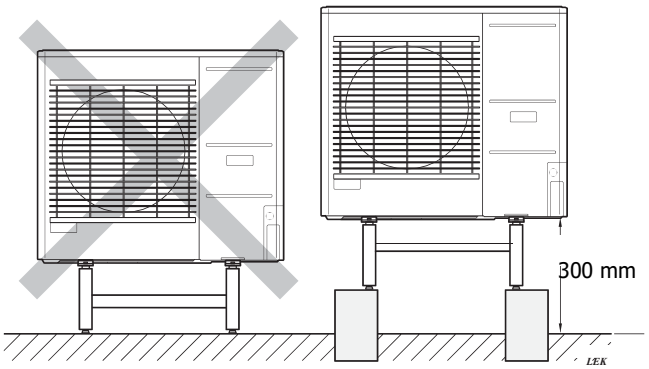
- In addition, the system should not disturb neighbours.

- The outdoor unit must not be placed so that outside air can swirl around the unit. This reduces output and decreases efficiency.

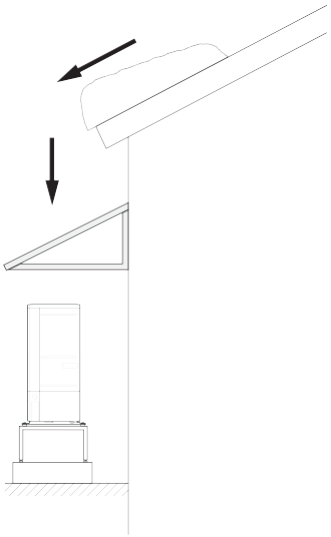
- The evaporator must be sheltered from direct wind, because this can reduce the defrosting capacity. Place the outdoor unit so that the evaporator is sheltered from the wind.

- A large volume of meltwater may run out of the heat pump during defrosting. Condensation water should be run into a rainwater well or similar (see page 10).

- Be careful not to scratch the heat pump during installation.



Never place the outdoor unit directly on a lawn or other soft surface.

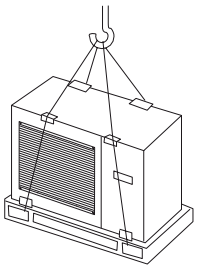


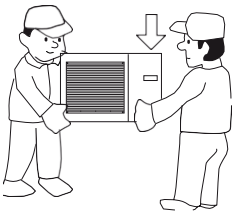
If there is a possibility that snow can fall onto the heat pump from the roof, a shelter or similar structure must be built to protect the heat pump, pipes and cables.

LIFTING THE UNIT FROM THE STREET TO THE INSTALLATION SITE

If the surface allows, a pallet jack should be used to move the outdoor unit to its installation site.

> ⚠ *NOTE!*
>
> The centre of gravity is on one end (look at the markings on the packaging).





If the outdoor unit has to be moved on a soft surface (e.g. a lawn), we recommend that the heat pump be lifted with a truck-mounted HIAB crane. When the device is lifted with a crane, the packaging must not opened and the load should be distributed evenly (see figure above).

If it is not possible to use a crane, the outdoor unit can be moved with a heavy-duty hand truck, The outdoor unit must be lifted from the side marked “heavy side”. An assistant will be needed to move the outdoor unit.

LIFTING FROM A PALLET TO THE INSTALLATION SITE

Before lifting, remove the packaging and load securing.

Run lifting slings around each leg. Four people will be needed to lift the device - one person for each sling.

The heat pump may only be lifted from its legs.

DISPOSAL

When disposing of the product, it must be removed in reverse order. In this case, the device should be lifted from its base plate instead of on a pallet!

CONDENSATION WATER DRAINAGE

Condensation water drains into the ground under the outdoor unit. In order to avoid damaging the house and heat pump, condensation water should be collected and drained out.

> ⚠ *NOTE!*
>
> Effective drainage is vital to the proper functioning of the heat pump. The condensation hose should be placed so that water will not damage the house.

> ⚠ *NOTE!*
>
> In order to ensure proper function, accessory KVR 10 should be used. (Not included.)

> ⚠ *NOTE!*
>
> Electrical and cable installations must be performed under the supervision of a licensed electrician.

> ⚠ *NOTE!*
>
> Self-regulating heating cables may not be connected.

- Condensation water (up to 50 l/day) must be run from the device into a drain with as short a length of pipe as possible.
- The exposed section of pipe must be heated with a heating cable to prevent freezing.
- The pipe must descend from the heat pump to the drain for its entire length.
- The end of the drainage pipe must be below the frost line or indoors (compliance with local regulations is required).
- Use a trap if air can circulate in the drainage pipe.
- Insulation must be firmly pressed against the bottom of the drip tray.

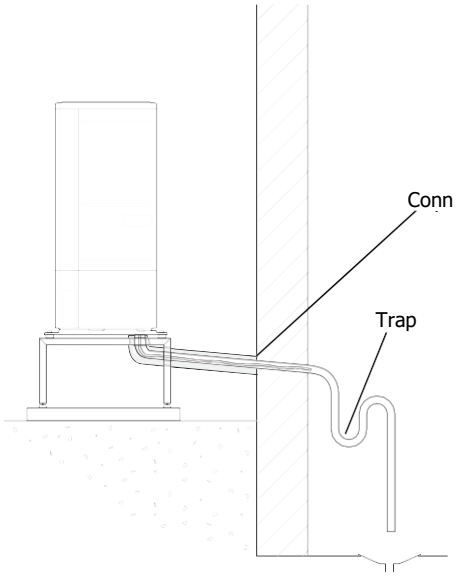
Drip tray heater, control

Voltage is supplied to the drip tray heater when the following conditions are met:

1. The compressor has been running for at least 30 minutes after the last start.
2. The ambient temperature is below 1 °C.

Recommended alternative to condensation water drainage

Indoor floor drain



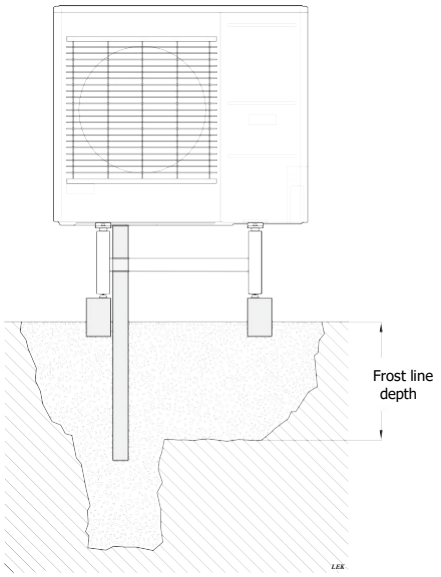
Condensation water is run to the indoor floor drain (compliance with local regulations is required).

The pipe must descend from the heat pump for its entire length.

There must be a trap in the drain pipe to ensure that no air can circulate in the pipe.

KVR 10 is extended as shown in the figure. The pipe extension into the inside of the house is not included.

Stone caisson

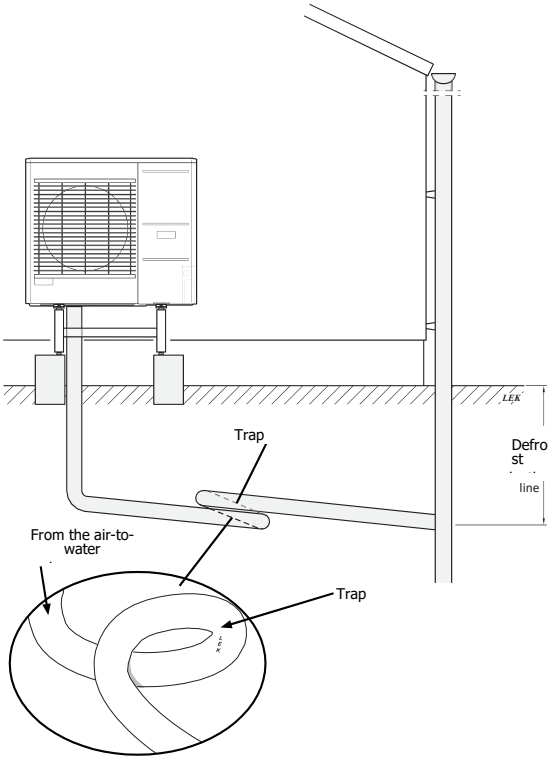


If the house has a basement, the stone caisson must be placed so that meltwater will not damage the house. Otherwise, the stone caisson can be placed directly under the heat pump.

The end of the drain pipe must be below the frost line.

Rainwater well

> ***NOTE!***
>
> Bend the hose into a loop to form a trap (see figure).

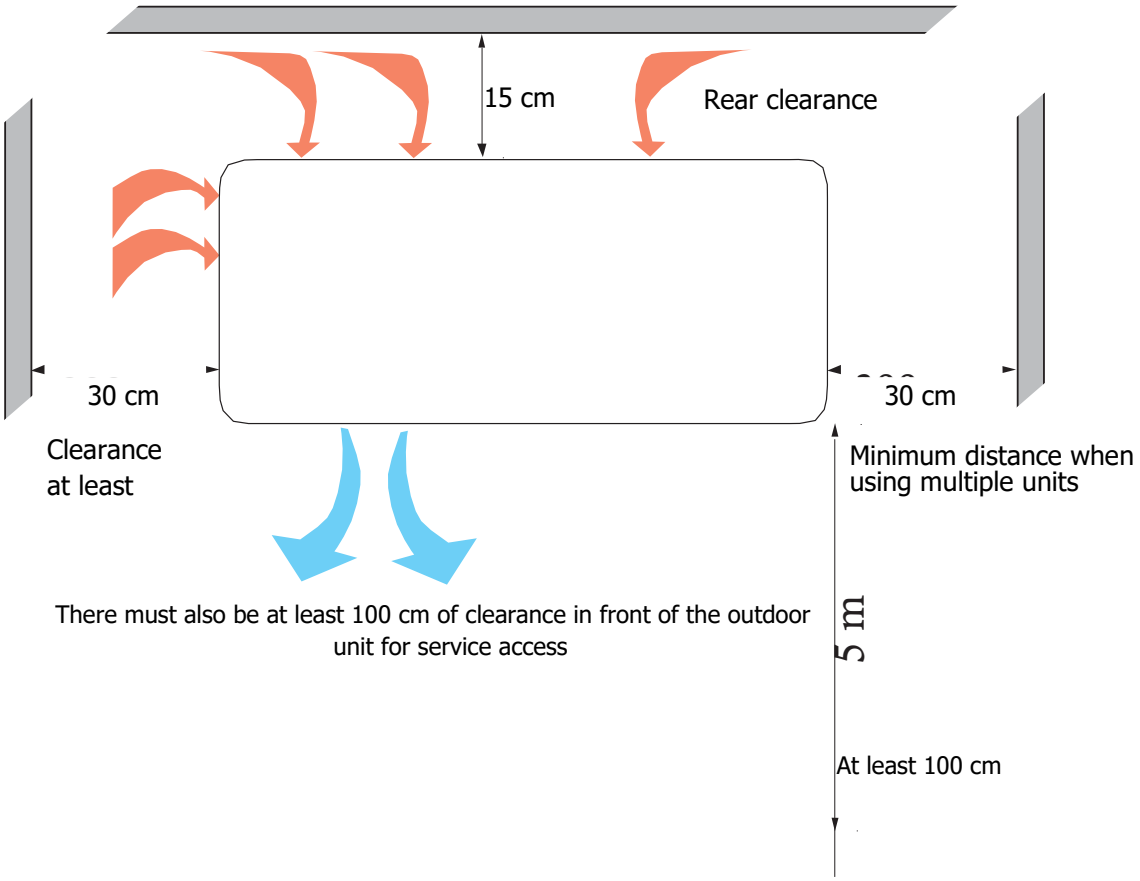


- The end of the drain pipe must be below the frost line.
- The pipe must descend from the heat pump for its entire length.
- There must be a trap in the drain pipe to ensure that no air can circulate in the pipe.
- The installation length can be adjusted by changing the size of the trap.

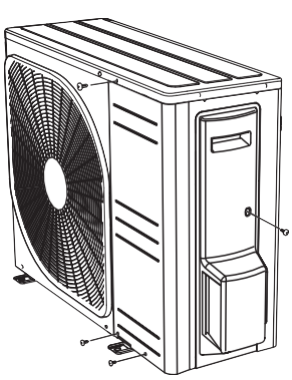
> ***REMEMBER!***
>
> If the recommended alternatives are not used, steps must be taken to ensure that condensation water is effectively drained.

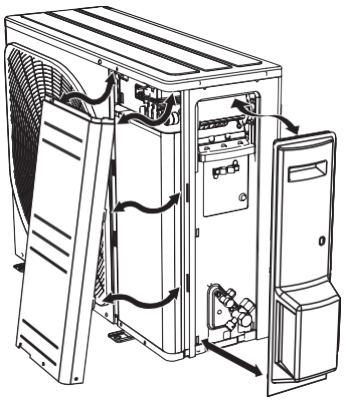
INSTALLATION SPACE

The distance between the outdoor unit and wall must be at least 15 cm. There must be at least 100 cm of overhead clearance above the outdoor unit. There must also be 100 cm of clearance in front of the outdoor unit for service access

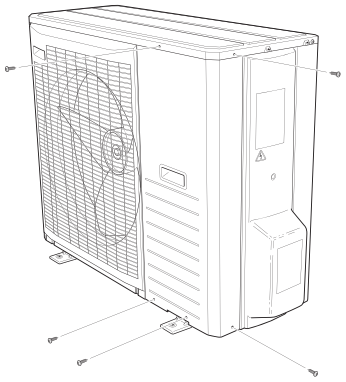


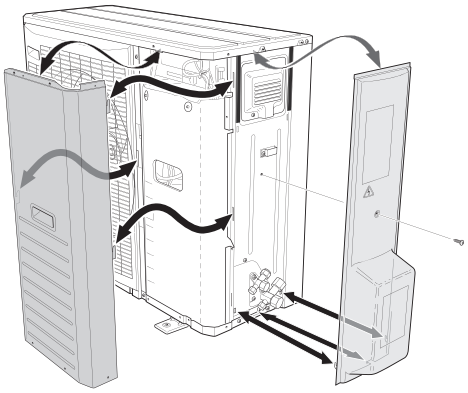
Split 6

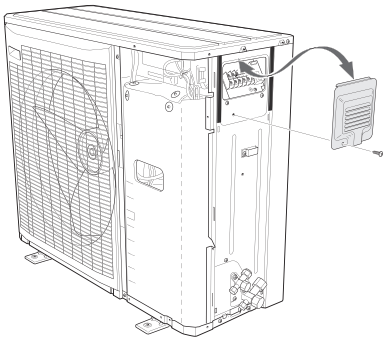




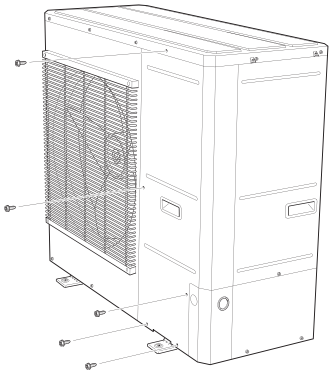
Split 8

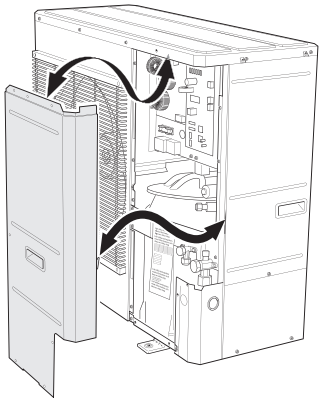




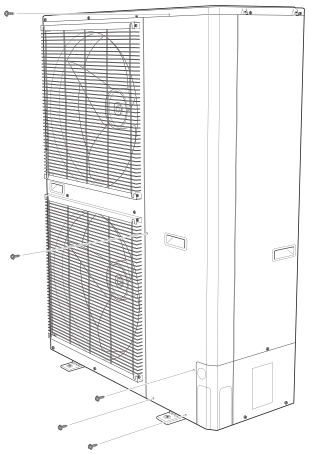


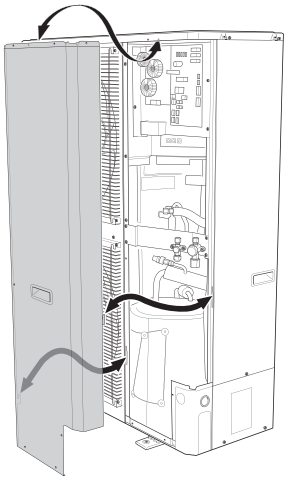
Split 12





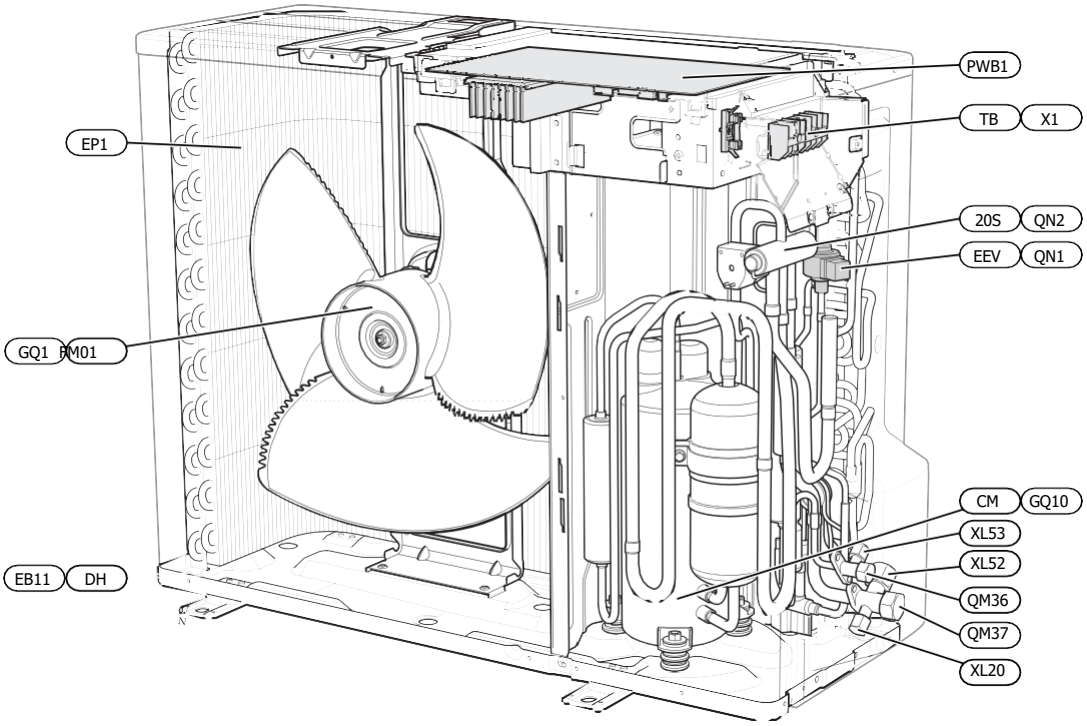
Split 16



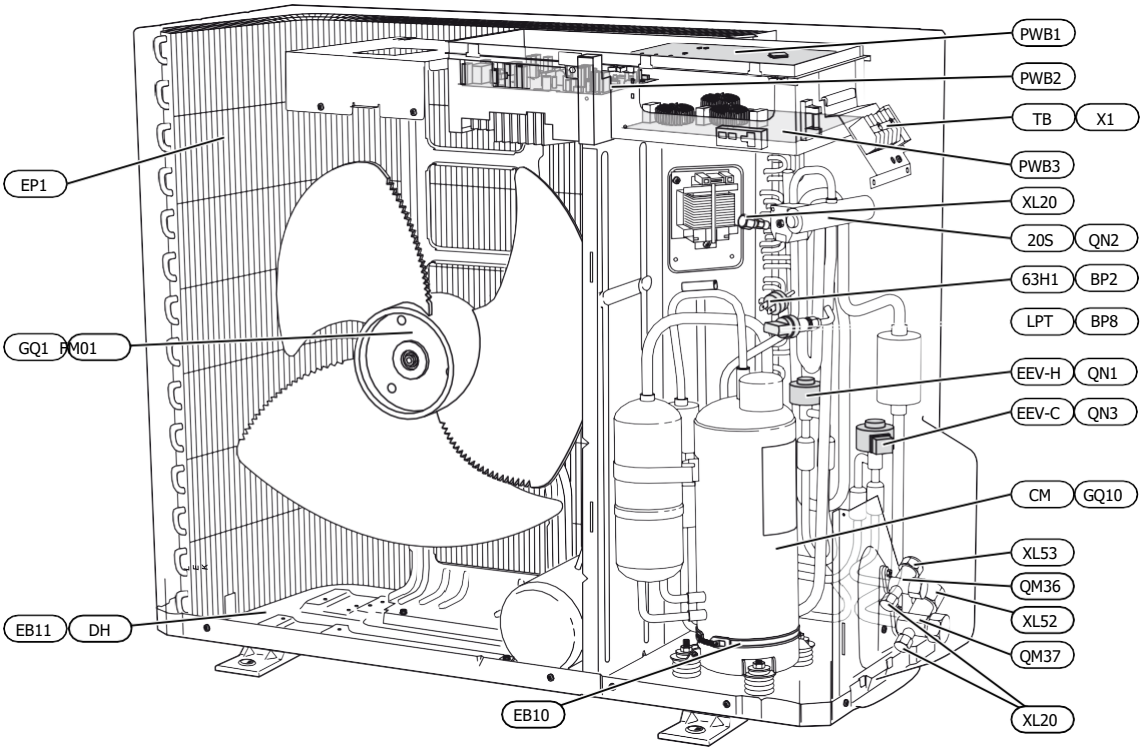


3 Heat pump construction

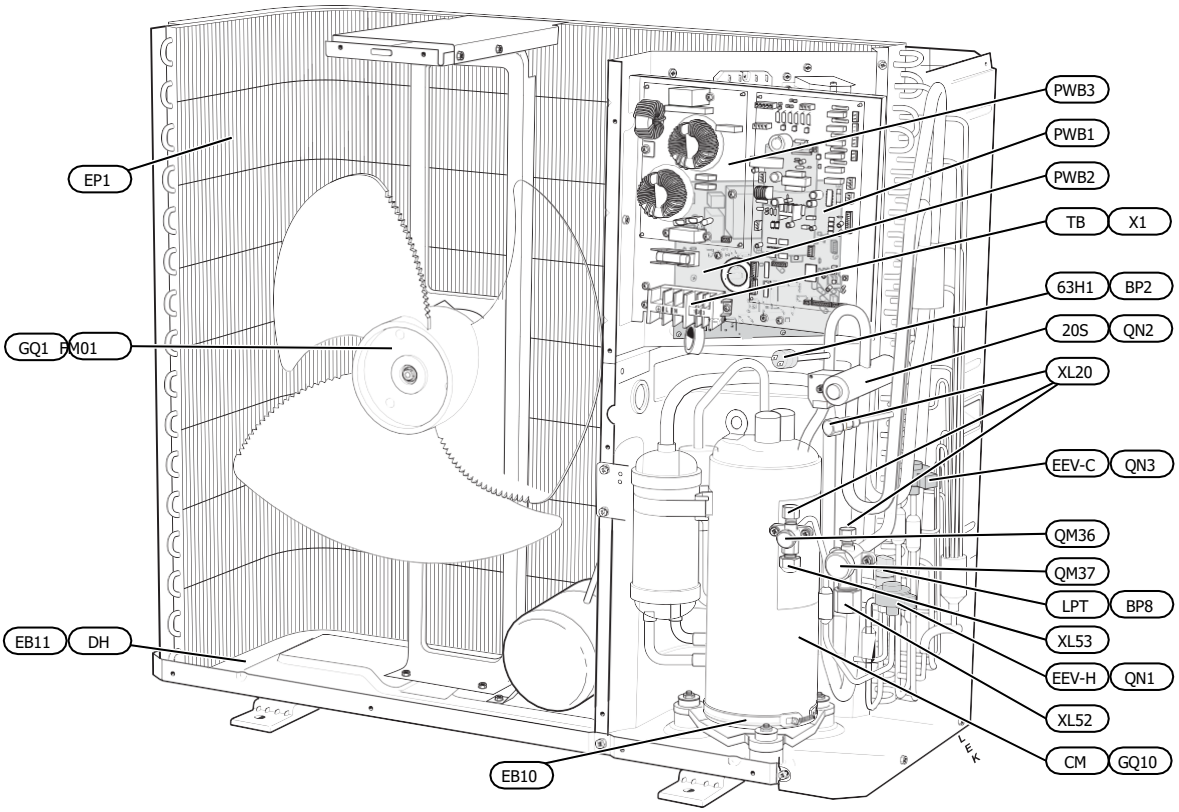
Component location Split 6



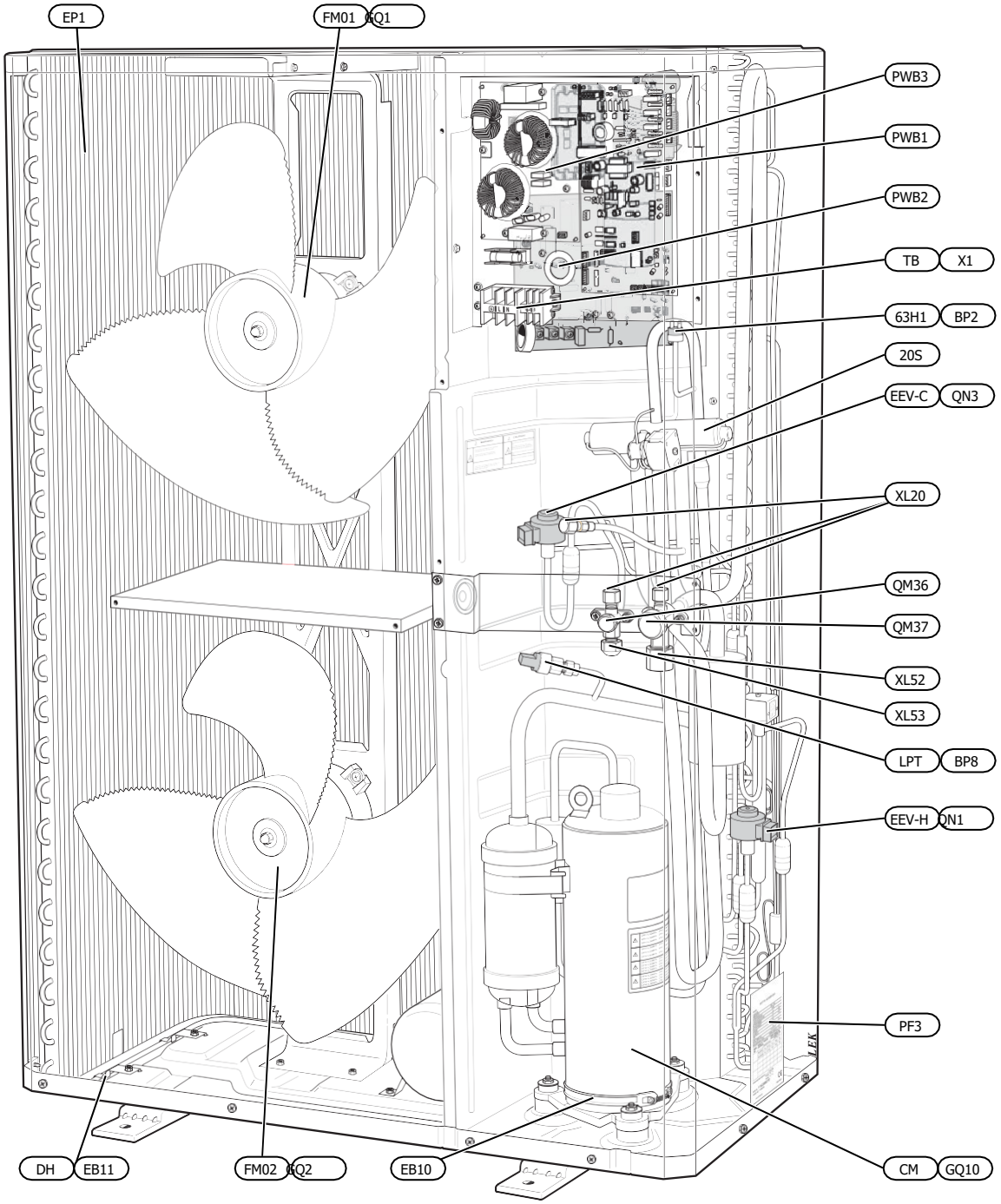
Component location Split 8



Component location Split 12



Component location Split 16



Component list
Split outdoor units

PLUMBING CONNECTIONS

QM36	Service valve, liquid side
QM37	Service valve, gas side
XL20	Connection, service
XL52	Connection, gas pipe
XL53	Connection, liquid pipe

SENSOR ETC.

BP2 (63H1)	High-pressure pressostat
BP8 (LPT)	Low-pressure transmitter

ELECTRICAL COMPONENTS

EB11 (DH)	Drip tray heater
GQ1 (FM01)	Fan
GQ2 (FM02)	Fan
(PWB1)	Control board
(PWB2)	Inverter board
(PWB3)	Filter board
X1 (TB)	Terminal block, power supply and communication

REFRIGERATION COMPONENTS

EB10 (CH)	Compressor heater
EP1	Evaporator
GQ10 (CM)	Compressor
QN1 (EEV-H)	Expansion valve, heating
QN2(20S)	4-way valve
QN3 (EEV-C)	Expansion valve, cooling

OTHER

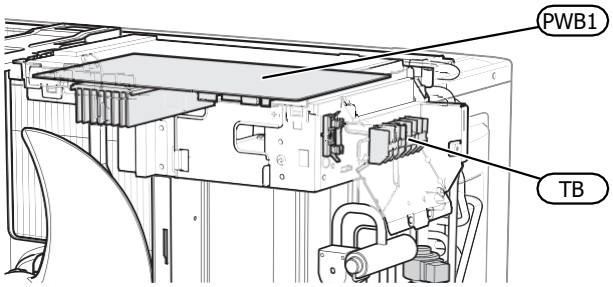
PF3	Type plate

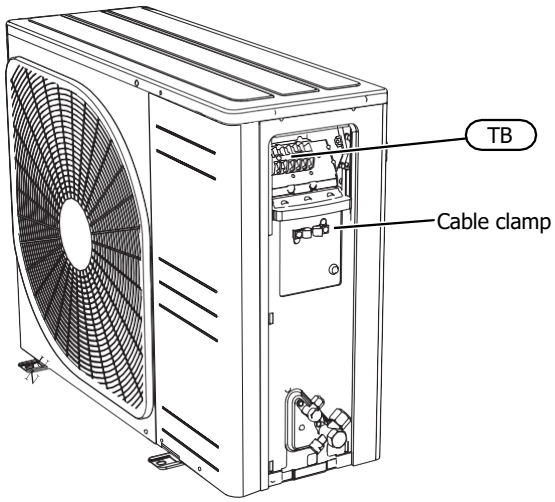
Component diagram markings compliant with the EN 81346-2 standard.
Markings in parentheses are compliant with the manufacturer's standard.

Electrical panel

COMPONENT LOCATION

Split 6





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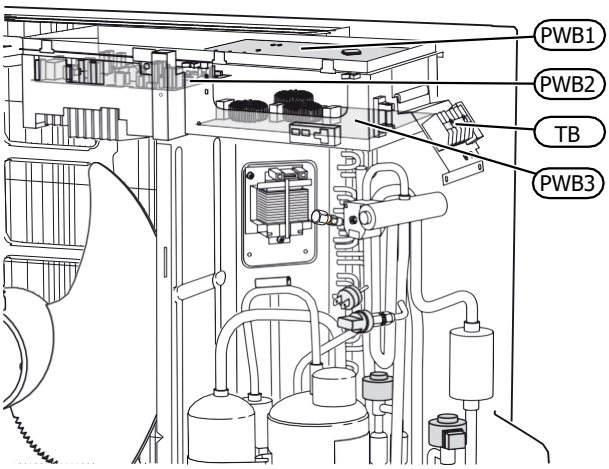
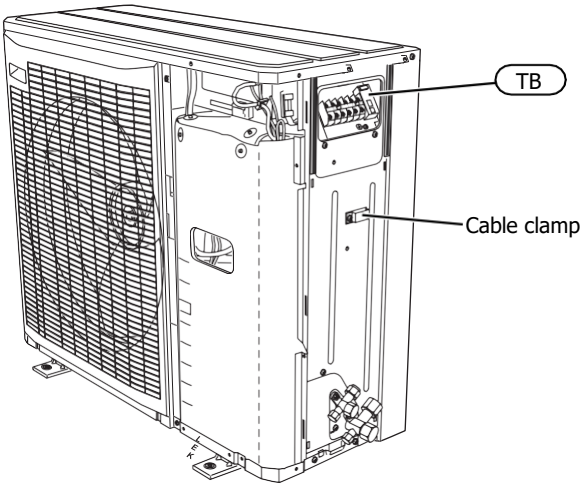
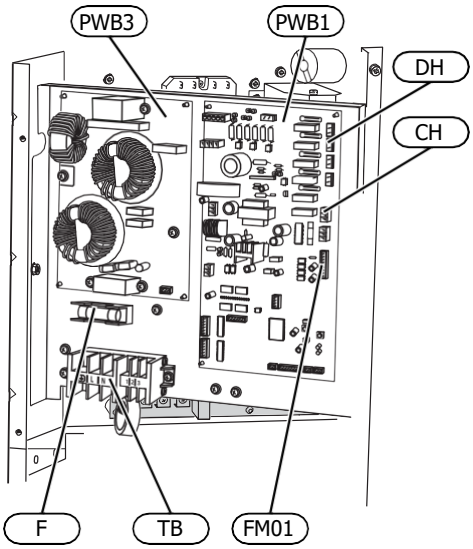
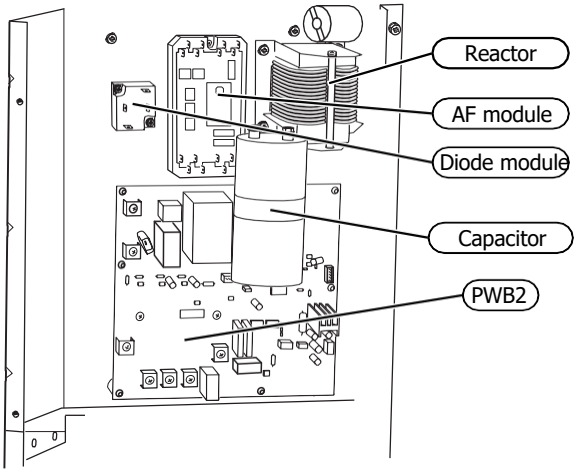




Split 12/Split 16





Electrical components Split outdoor units

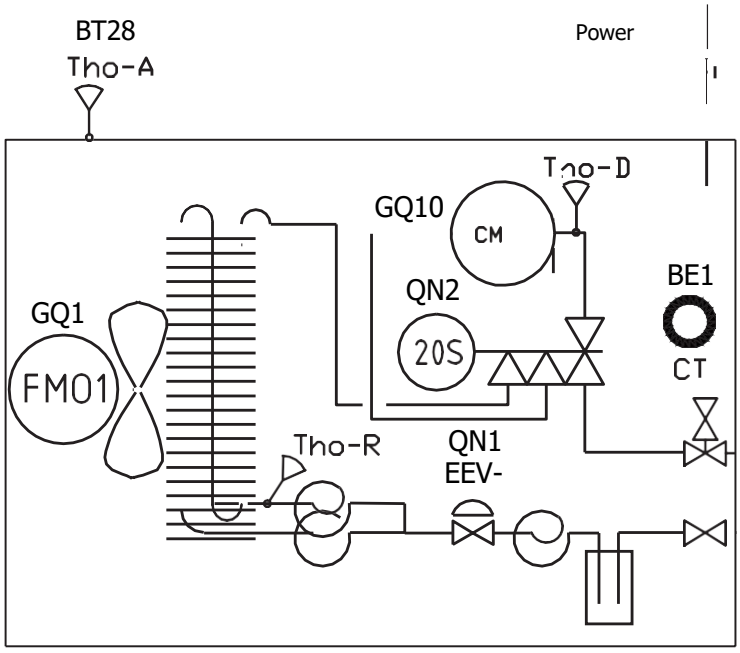
(CH)	Compressor heater
(DH)	Drip tray heater
F	Fuse
(FM01)	Fan motor
(PWB1)	Control board
(PWB2)	Inverter board
(PWB3)	Filter board
(TB)	Terminal block, power supply and communication

Component diagram markings compliant with the EN 81346-2 standard.
Markings in parentheses are compliant with the manufacturer's standard.

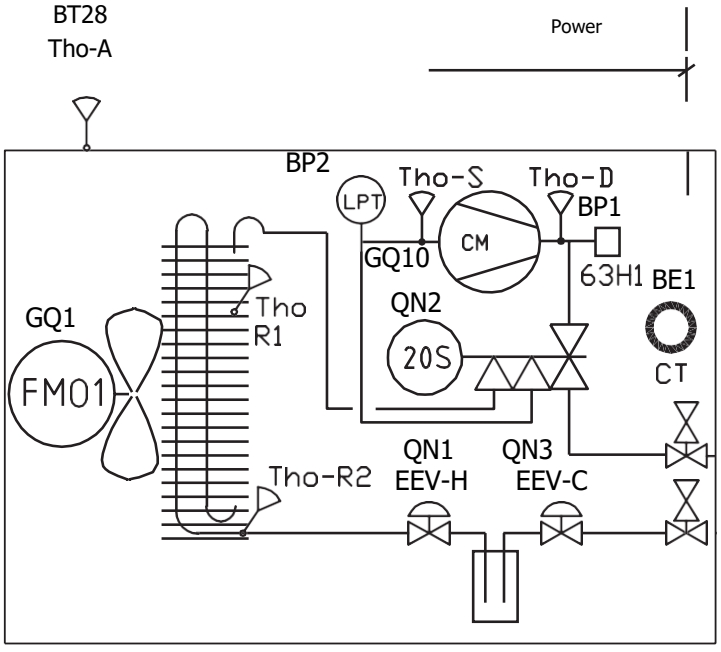
Sensor locations

TEMPERATURE SENSOR PLACEMENT

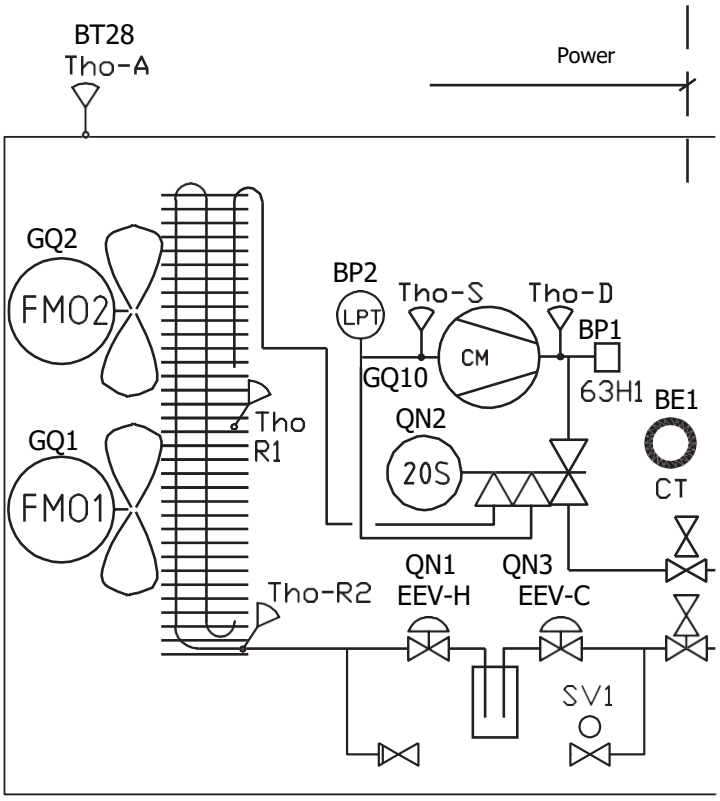
Outdoor unit Split 6



Outdoor unit SPLIT 8 / Split 12



Outdoor unit Split 16

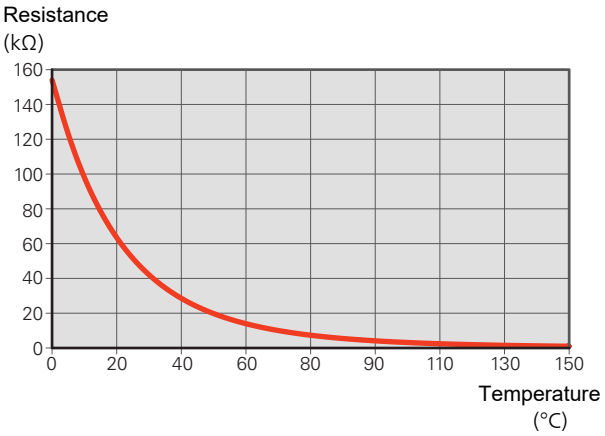


BE1 (CT)	Current sensor
BT28 (Tho-A)	Ambient temperature
BP1 (63H1)	High-pressure pressostat
BP2 (LPT)	Low-pressure transmitter
GQ1 (FM01)	Fan
GQ2 (FM02)	Fan
GQ10 (CM)	Compressor
QN1 (EEV-H)	Expansion valve, heating
QN2 (20S)	4-way valve
QN3 (EEV-C)	Expansion valve, cooling
Tho-D	Temperature sensor, hot gas
Tho-R1	Temperature sensor, evaporator (out)
Tho-R2	Temperature sensor, evaporator (return)
Tho-S	Temperature sensor, suction gas

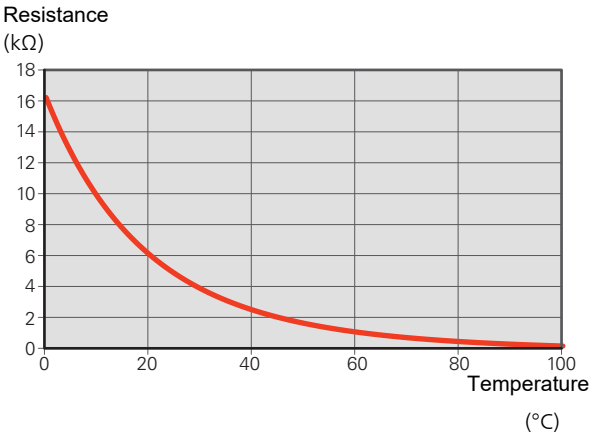
Component diagram markings compliant with the EN 81346-2 standard.
Markings in parentheses are compliant with the manufacturer's standard.

Split 6 SENSOR INFORMATION

Tho-D

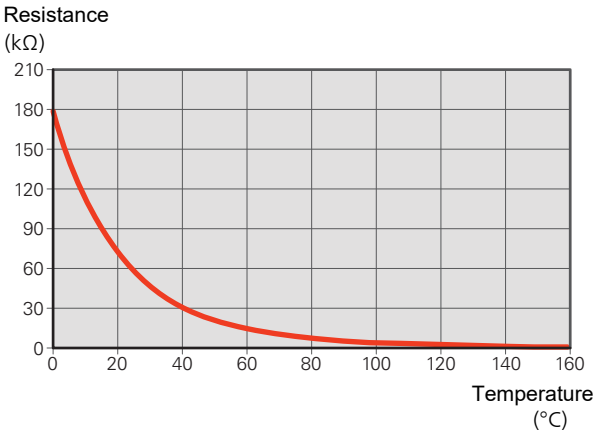


Tho-A, R

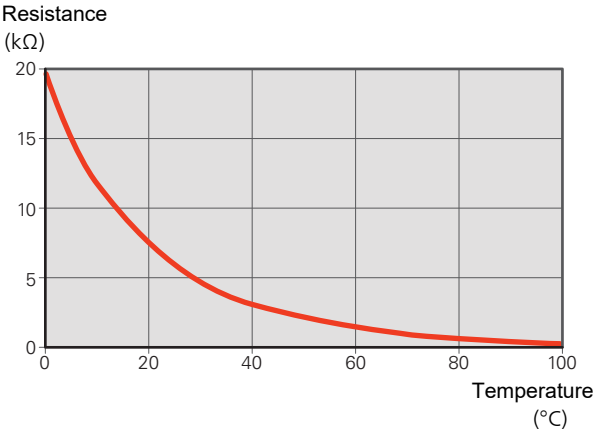


Split 8/12/16 SENSOR INFORMATION

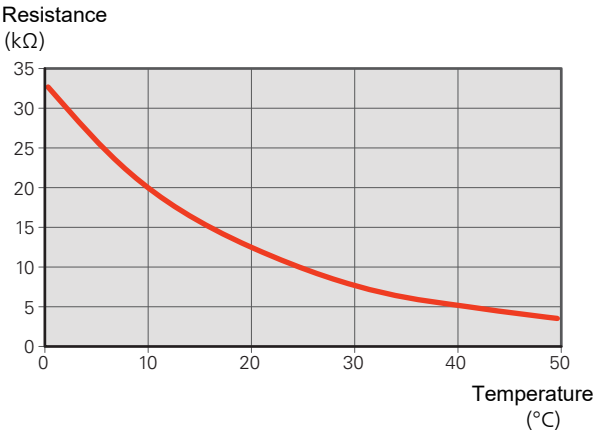
Tho-D



Tho-S, Tho-R1, Tho-R2



Tho-A (BT28)



4 Plumbing connections

NOTE!

Further information: See chapter “Plumbing connections” in the SplitBox installation manual

5 Electrical connections

General

The outdoor unit and SplitBox are not fitted with a power supply circuit breaker. As a result, the supply cables must be connected to a circuit breaker with a minimum breaking gap of 3 mm.

The supply voltage must be 230 V 50 Hz from an electrical distribution board with fuses.

- Before running an insulation test on the property, the SplitBox and outdoor unit must be disconnected from the power supply.
- Fuse sizes (see “Fuses” in technical specifications).
- If the property is fitted with earth-fault breakers, the outdoor unit must be connected to its own, separate earth-fault breaker.
- The heat pump must not be connected without the consent of the power supplier, and all connections must be performed under the supervision of a licensed electrician.
- Cables must be installed so that they do not rub against metal edges or become pinched between panels.
- The outdoor unit is fitted with a single-phase compressor. This means that one phase is loaded with a current of multiple amperes (A) while the compressor is running. The maximum loads are shown in the table.

Outdoor unit	*Max. current (A)*
Split 6	15
Split 8	16
Split 12	23
Split 16	25

- The maximum allowable phase load can be limited to a lower maximum current in the indoor module or control unit.

NOTE!

Electrical connections and any necessary maintenance may only be performed under the supervision of a licensed electrician. Shut the power off at the circuit breaker before performing any maintenance work. Electrical connections and wire pulling must be done in full accordance with valid legislation and regulations.

NOTE!

In order to avoid damaging the electronics in the air-to-water heat pump, check all connections, line-to-line voltage and line-to-neutral voltage before starting the machine.

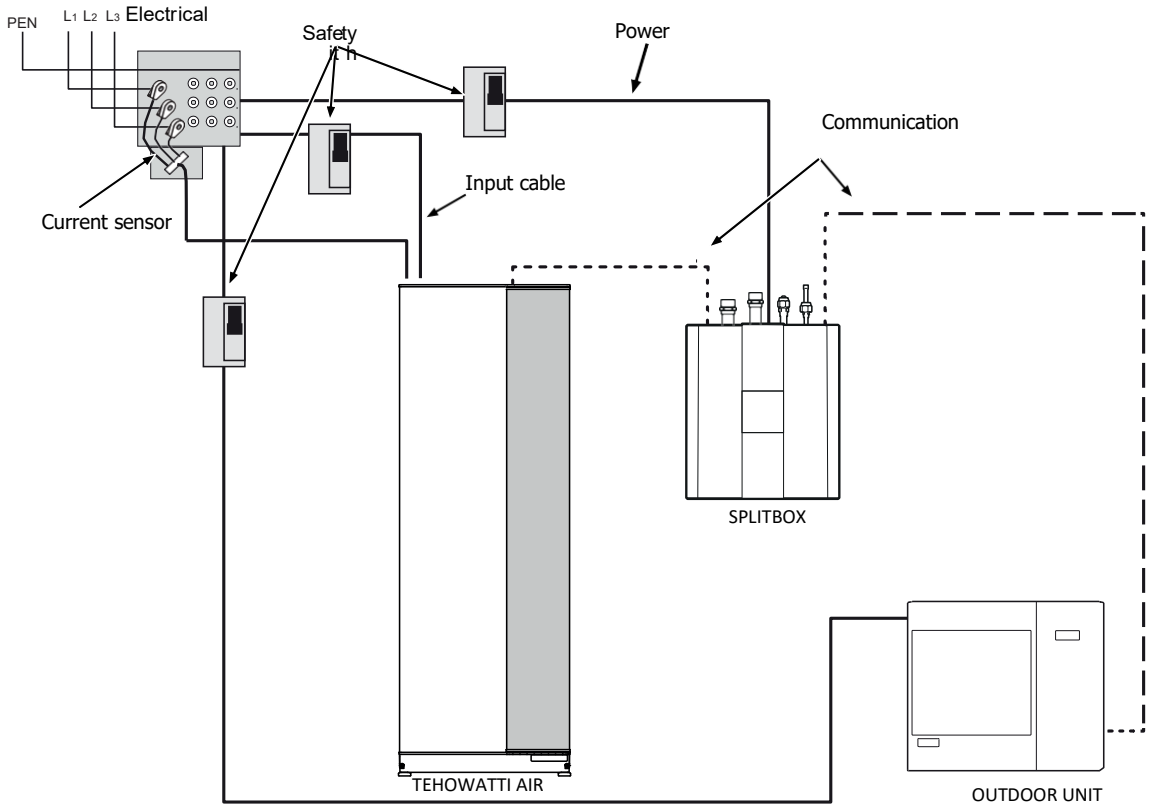
NOTE!

When connecting, pay attention to live external control.

NOTE!

If the power supply cable is damaged, it must only be replaced by KAUKORA, a manufacturer service representative or an equivalent licensed professional in order to ensure safety.

PRINCIPLE - ELECTRICAL INSTALLATION



Electrical components

See component locations in section Heat pump construction, Electrical panel on page 20.

Access - electrical connection

REMOVING ACCESS PANELS

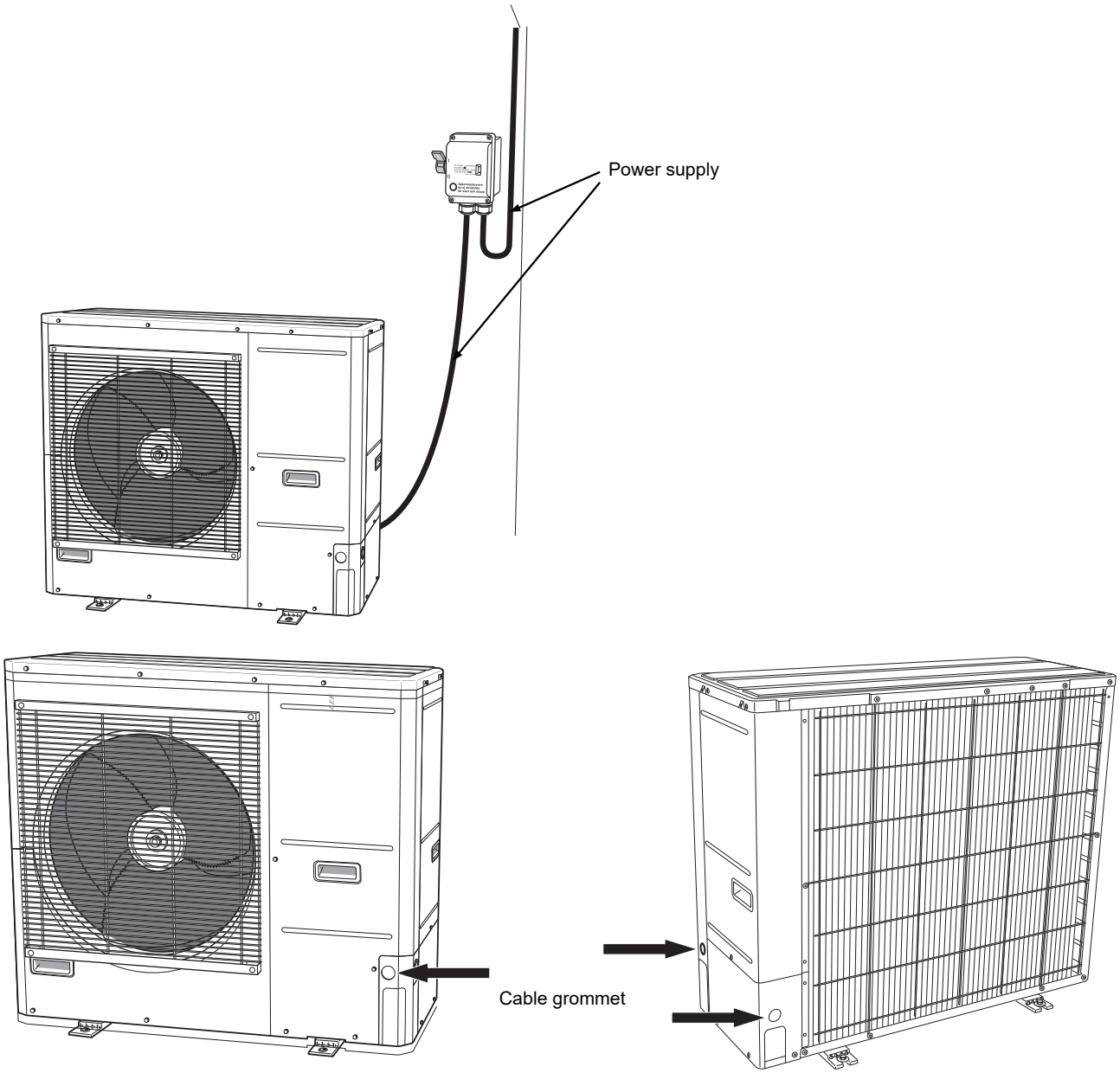
See section Removing access panels on page 13.

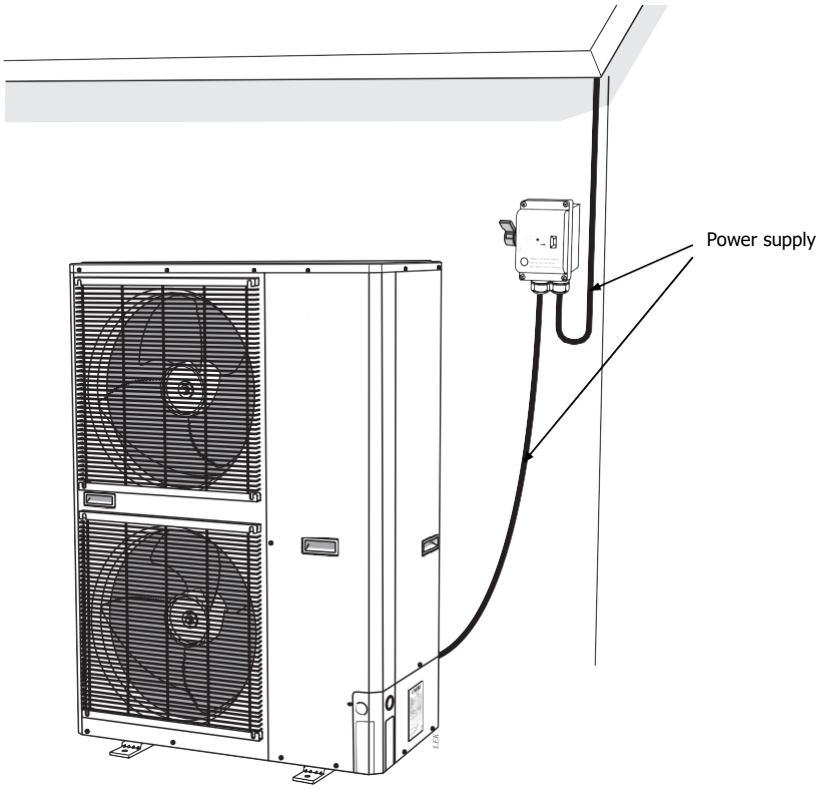
Connections

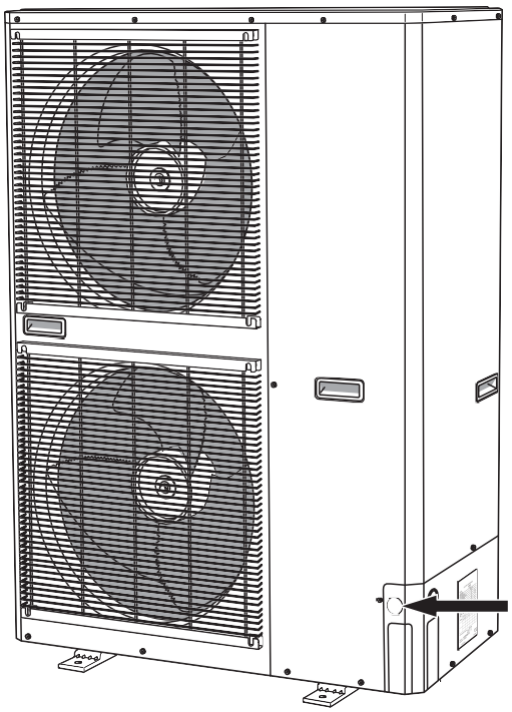
NOTE!

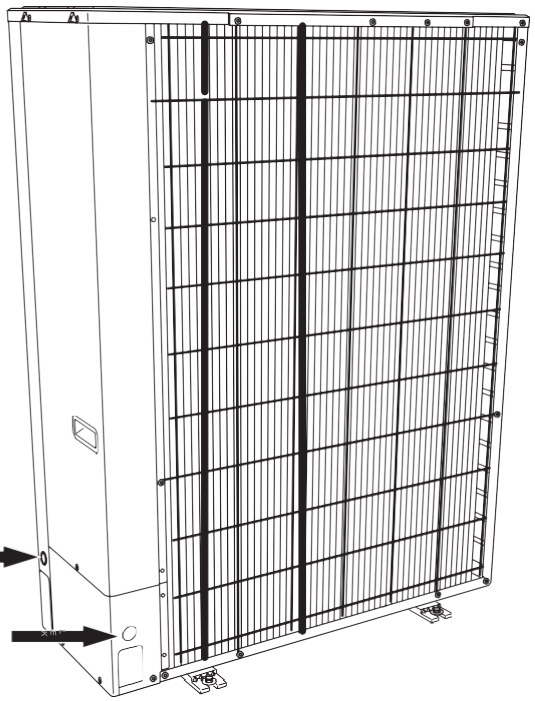
In order to avoid faults, the outdoor connections for communication and/or sensor cables must be installed at least 20 cm from the high voltage cable.

ELECTRICAL CONNECTION Split outdoor unit

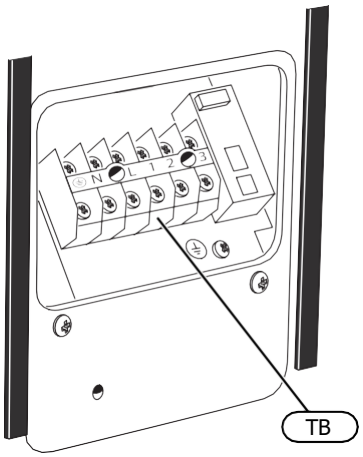



Power supply




Cable grommet

COMMUNICATION CONNECTION



The communication cable is connected to the TB.

See also the electrical schematic on page 54.

For additional information, refer to the SplitBox installation manual.

CONNECTING ACCESSORIES

The instructions for connecting accessories can be found in the installation instructions included with each accessory.
See page 36 for the list of accessories that can be used with the outdoor unit.

NOTE!

Further information: Further information: See chapter “Electrical connections” in the SplitBox installation manual.

6 Start-up and adjustments

Compressor heater

The outdoor unit is fitted with a compressor heater (CH), which heats the compressor before starting and when the compressor is cold. (Does not apply to the Split 6)

NOTE!

The compressor heater should be turned on 6-8 hours before the first start-up (see chapter “Start-up and inspections” in the indoor module/outdoor unit installation instructions).

NOTE!

Further information: See chapter “Commissioning and adjusting” in the SplitBox installation manual.

7 Control - Heat pump

NOTE!

Further information: See chapter “Control - Heat pump” in the SplitBox installation manual.

8 Faults

NOTE!

Further information: See chapter “Faults” in the SplitBox installation manual

9 Alarm list

Alarm	*Alarm text on the screen*	*Description*	*Possible cause*
162	High condenser out.	Temperature too high out from the condenser. Self-resetting.	• Low flow during heating • Temperatures set too high
163	High condenser in.	Temperature too high into the condenser. Self-resetting.	• Temperature generated by another heat source
183	Defrosting in progress	Not an alarm - only the operational status.	• Set when the heat pump is defrosting.
220	HP alarm	The high pressure switch (63H1) is triggered 5 times within 60 minutes or for 60 minutes continuously.	• Insufficient air circulation or blocked heat exchanger • Open circuit or short circuit in the high pressure switch (63H1) input • Faulty high pressure switch • Expansion valve not connected properly • Service valve closed • Defective control board • Low or no flow during heating • Faulty circulation pump • Faulty fuse, F(4A)
221	LP ALARM	Low pressure sensor (LPT) value too low 3 times within 60 minutes.	• Open circuit or short circuit in the low pressure sensor input • Faulty low pressure sensor (LPT) • Faulty control board in the outdoor unit • Open circuit or short circuit on input for suction gas sensor (Tho-S) • Faulty suction gas sensor (Tho-S)
223	OU Com. error	Communication between the control board and communication board is interrupted. There must be a 22 volt direct current (DC) for switch CNW2 on the control board (PWB1).	• Any circuit breakers are off • Faulty cable routing
224	Fan alarm	Deviations in fan speed in the outdoor unit.	• Fan cannot rotate freely • Faulty control board • Faulty fan motor • Dirty outdoor unit control board • Fuse (F2) tripped
230	Continuously high hot gas temperature	Hot gas sensor (Tho-D) temperature deviation occurring twice within 60 minutes or for 60 minutes continuously	• Sensor does not work (see "Communication connection") • Insufficient air circulation or blocked heat exchanger • If the fault persists during cooling, there may be an insufficient amount of refrigerant • Faulty control board
254	Communication error	Accessory board communication error	• Outdoor unit dead • Fault in the communication cable

Alarm	*Alarm text on the screen*	*Description*	*Possible cause*
261	High temperature in the heat exchanger	Temperature deviation on the heat exchanger sensor (Tho-R1/R2) occurring five times within 60 minutes or for 60 minutes continuously.	• Sensor does not work (see "Faults") • Insufficient air circulation or blocked heat exchanger • Faulty control board in the outdoor unit • Too much refrigerant
262	Power transistor too hot	When the IPM (Intelligent Power Module) displays FO (Fault Output) five times during a 60-minute period.	• Can occur when 15V power supply to the inverter PCB is unstable.
263	Inverter fault	Voltage from the inverter outside set parameters four times within 30 minutes.	• Disturbance in the power supply • Service valve closed • Insufficient amount of refrigerant • Compressor fault • Faulty inverter circuit board
264	Inverter fault	Communication cut between the inverter circuit board and control board.	• Open circuit in connection between boards • Faulty inverter circuit board • Faulty control board
265	Inverter fault	Continuous deviation in power transistor for 15 minutes	• Faulty fan motor • Faulty inverter circuit board
266	Insufficient refrigerant	Insufficient refrigerant is detected upon start-up in cooling mode.	• Service valve closed • Loose connection sensor (BT15, BT3) • Faulty sensor (BT15, BT3) • Too little refrigerant.
267	Inverter fault	Compressor start fail	• Faulty inverter circuit board • Faulty control board • Compressor fault
268	Inverter fault	Overcurrent, Inverter A/F module	• Sudden power failure
271	Cold outdoor air	BT28 (Tho-A) temperature below the set value that permits operation	• Cold weather • Sensor fault
272	Hot outdoor air	BT28 (Tho-A) temperature above the set value that permits operation	• Hot weather • Sensor fault
277	Sensor fault Tho-R	Sensor fault, heat exchanger in (Tho-R).	• Open circuit or short circuit on sensor input • Sensor does not work (see "Faults") • Faulty control board
278	Sensor fault Tho- A	Sensor fault, ambient temperature sensor BT28 (Tho-A).	• Open circuit or short circuit on sensor input • Sensor does not work (see "Faults") • Faulty control board
279	Sensor fault Tho-D	Sensor fault, hot gas (Tho-D).	• Open circuit or short circuit on sensor input • Sensor does not work (see "Faults") • Faulty control board
280	Sensor fault Tho-S	Sensor fault, suction gas (Tho-S).	• Open circuit or short circuit on sensor input • Sensor does not work (see "Faults") • Faulty control board
281	Sensor fault LPT	Sensor fault, low pressure sensor	• Open circuit or short circuit on sensor input • Sensor does not work (see "Faults") • Faulty control board • Fault in the refrigerant circuit
294	Incompatible outdoor air heat pump	Heat pump and indoor module/control unit do not work properly together due to technical parameters.	• Outdoor unit and indoor module/control unit are not compatible

10 Accessories

Not all accessories are available in all market areas.

GROUND STAND

Split 6-12

Prod. no. T000767

DRAIN PIPE

KVR 10-10

1 metre

Prod. no. M03215

KVR 10-30

3 metres

Prod. no. M03216

KVR 10-60

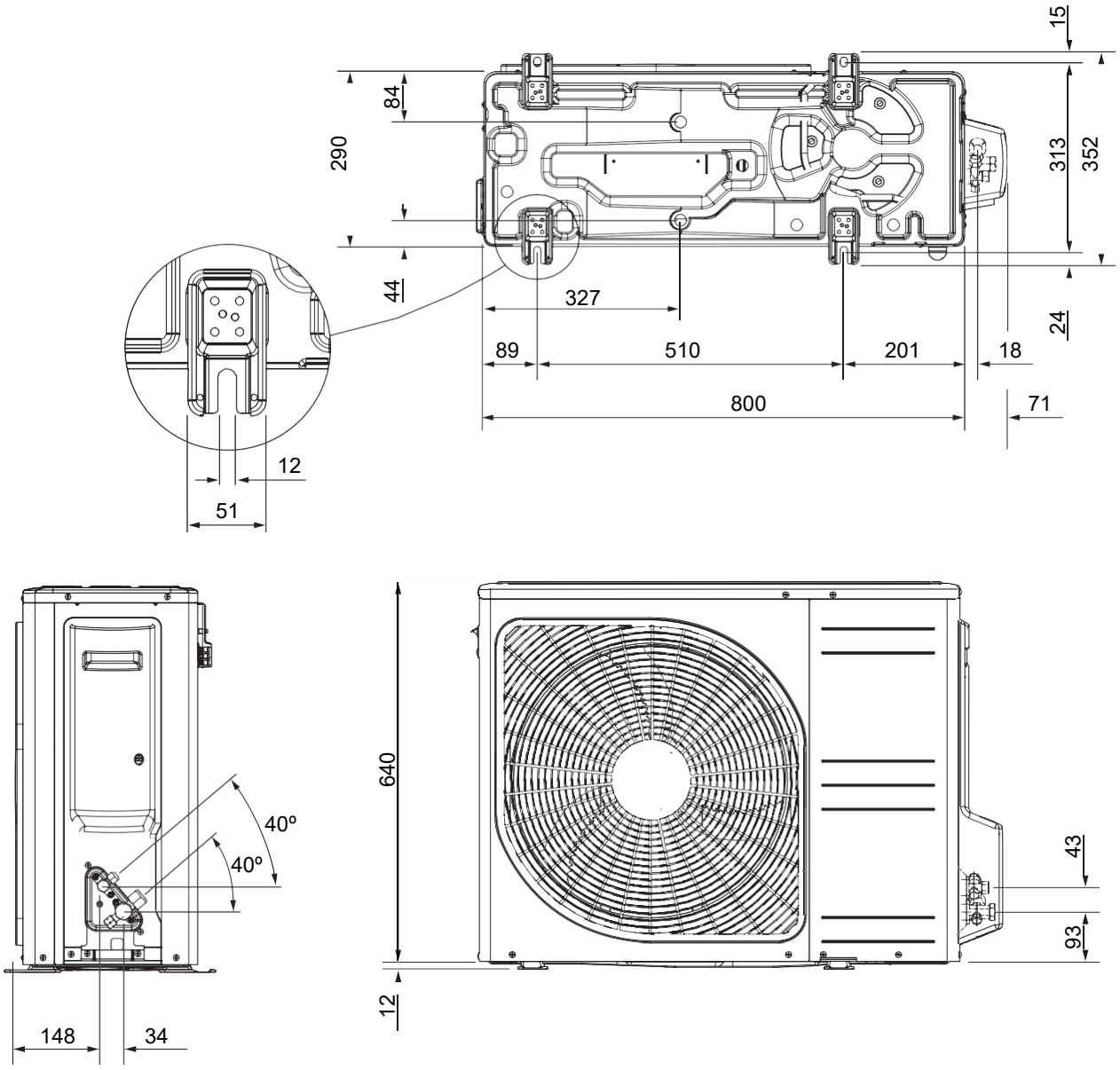
6 metres

Prod. no. M03217

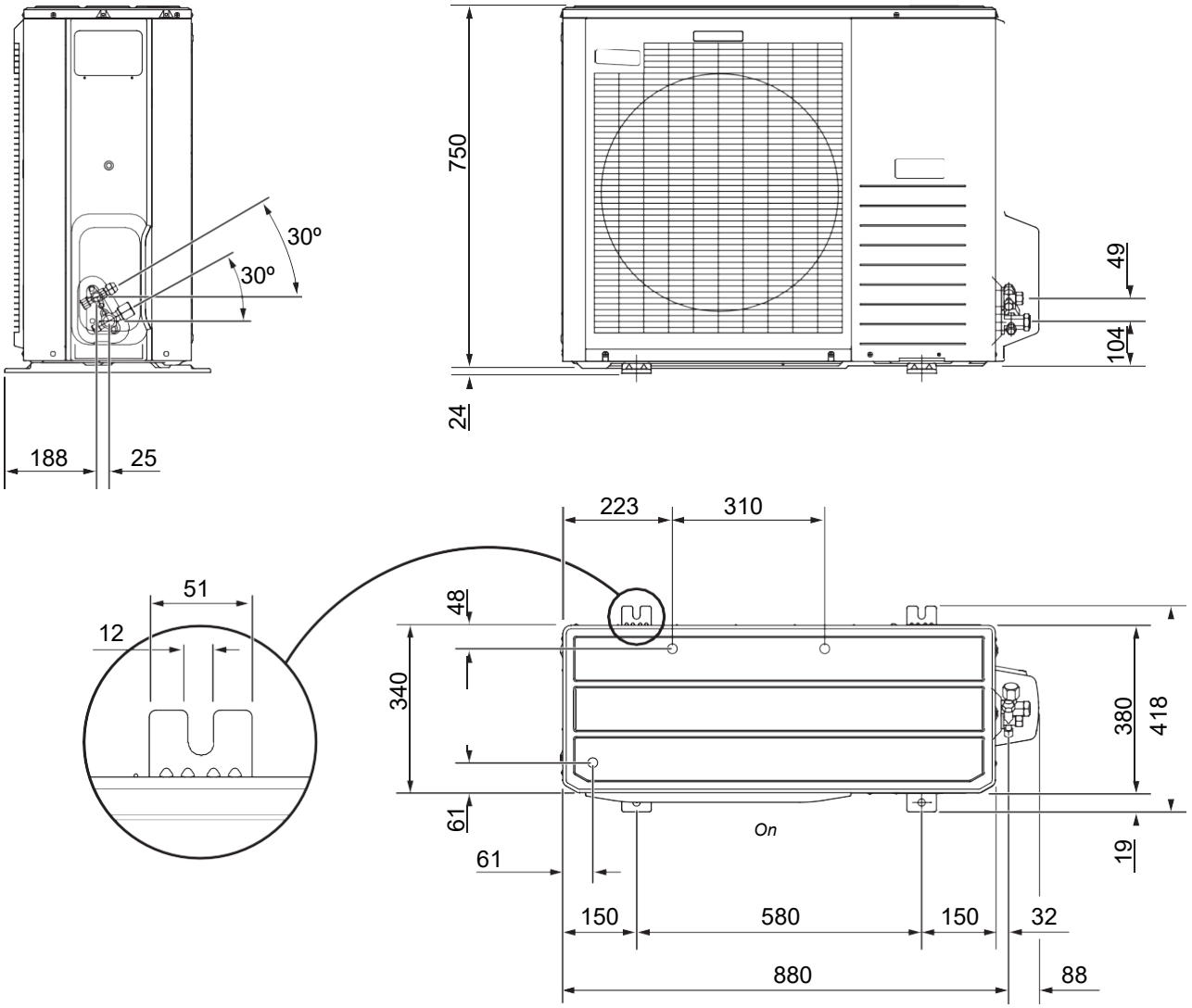
11 Technical specifications

Dimensions

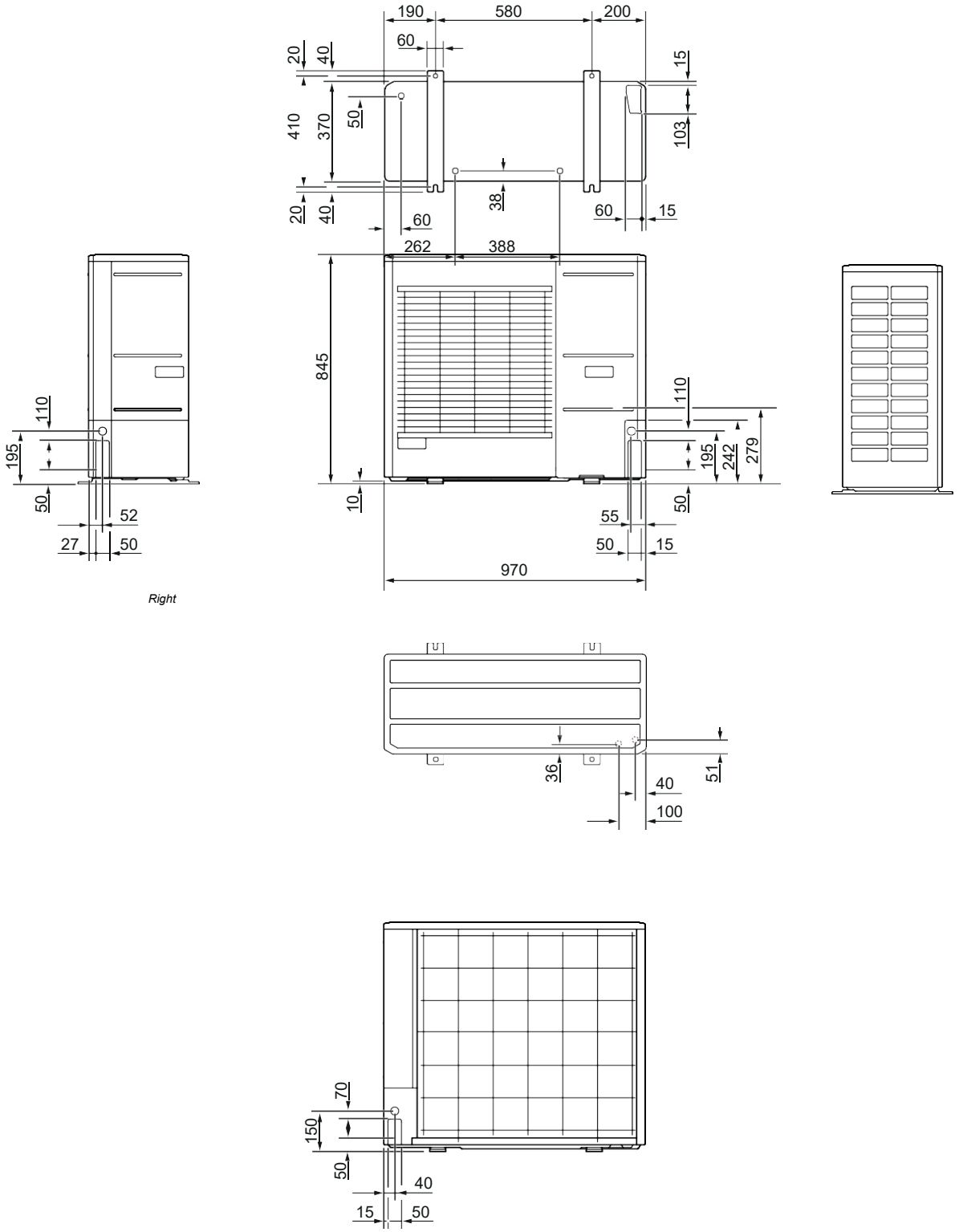
SPLIT 6



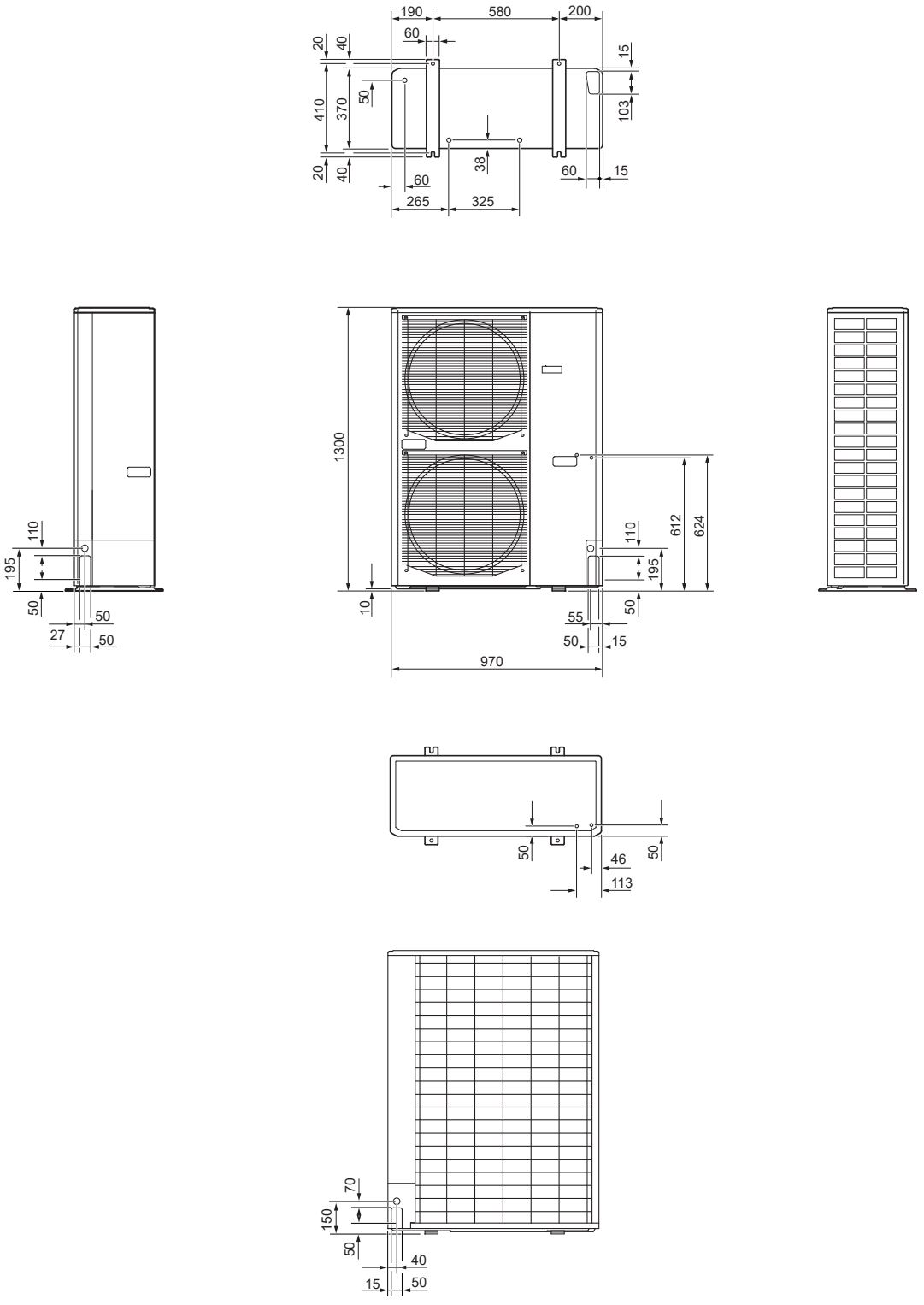
SPLIT 8


30º
30º
188
25
750
49
104
24
223
310
51
12
48
340
380
418
61
61
On
19
150
580
150
32
880
88

SPLIT 12


190
580
200
60
20
40
15
410
370
50
103
38
60
15
262
388
845
110
195
242
279
10
55
50
970
Right
36
40
51
100
70
150
50
40
15
50

SPLIT 16


190
580
200
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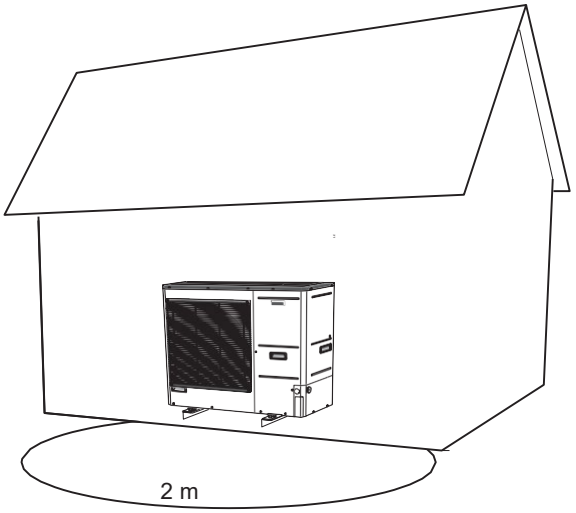
20
40
15
410
370
50
103
38
60
15
60
265
325
1300
110
195
50
27
50
50
612
624
10
55
50
970
46
113
70
150
40
15

Sound pressure levels

The outdoor unit is usually placed next to a house wall, which directs the travel of noise. This should be taken into consideration. As a result, every effort should be made to install the outdoor unit on the side of the house where the noise will be of minimal disturbance to the neighbours.

Because the sound pressure levels are further affected by walls, masonry, differences in ground level, etc., they should therefore only be considered suggestions.



Sound		*SPLIT 6*	*SPLIT 8*	*SPLIT 12*	*SPLIT 16*
Noise level* According to EN12102 at 7/45 (nominal)*	L_W(A)	51	55	58	62
Sound pressure level at a distance of 2 m free standing (nominal)*	dB(A)	37	41	44	48

* Free space.

Technical specifications

CE IP 21

SPLIT OUTDOOR UNIT

Outdoor unit		*SPLIT 6*	*SPLIT 8*	*SPLIT 12*	*SPLI T 16*
Output data according to EN14511 ΔT5K	Ambient temp./Supply temp.				
Heating Specified/supplied power/COP (kW/kW/-) - nominal	7/35 °C (floor)	2.67/0.5/5.32	3.86/0.83/4.65	5.21/1.09/4.78	7.03/1.45/4.85
	2/35 °C (floor)	2.32/0.55/4.2	5.11/1.36/3.76	6.91/1.79/3.86	9.33/2.38/3.92
	-7/35 °C (floor)	4.60/1.79/2.57	6.60/2.46/2.68	9.00/3.27/2.75	12.1/4.32/2.80
	7/45 °C	2.28/0.63/3.62	3.70/1.00/3.70	5.00/1.31/3.82	6.75/1.74/3.88
	2/45 °C	1.93/0.67/2.88	5.03/1.70/2.96	6.80/2.24/3.04	9.18/2.98/3.08
Cooling Specified/supplied power/EER - nominal	27/7 °C	5.87/1.65/3.56	7.52/2.37/3.17	9.87/3.16/3.13	13.30/3.99/3.33
	27/18 °C	7.98/1.77/4.52	11.20/3.20/3.50	11.70/3.32/3.52	17.70/4.52/3.91
	35/7 °C	4.86/1.86/2.61	7.10/2.65/2.68	9.45/3.41/2.77	13.04/4.53/2.88
	35/18 °C	7.03/2.03/3.45	9.19/2.98/3.08	11.20/3.58/3.12	15.70/5.04/3.12
Electrical data					
Rated voltage		230V 50 Hz, 230V 2AC 50Hz			
Max. current	A_{rms}	15	16	23	25
Recommended fuse	A_{rms}	16	16	25	25
Starting current	A_{rms}	5			
Max. airflow (heating,nominal)	m^3/h	2,530	3000	4380	6000
Fan output	W	50	86		2X86
Drip tray heater (built-in)	W	110	100	120	
Defrosting		Reverse cycle			
Enclosure rating		IP24			
Refrigerant circuit					
Refrigerant type		R410A			
GWP refrigerant		2,088			
Compressor		Twin Rotary			
Refrigerant amount	kg	1.5	2.55	2.90	4.0
CO_2 equivalent	t	3.13	5.32	6.06	8.35
Cut-out value pressostat HP	MPa (bar)	-	4.15 (41.5)		
Cut-out value, high pressure	MPa (bar)	4.5 (45)			
Cut-out value pressostat LP (15 s)	MPa (bar)	-	0.079 MPa (0.79)		
Max. length, refrigerant pipe, one coil	m	30*			
Max. height difference, refrigerant pipe	m	7			
Dimensions, refrigerant pipes		Gas pipe OD12,7 (1/2") Fluid line OD6.35 (1/4")	Gas pipe OD15.88 (5/8") Fluid line OD9.52 (3/8")		
Plumbing connections					
Plumbing connection alternative		Right side	Right side	Right/botto m/ backward	
Plumbing connections		Collar			
Dimensions and weight					
Width	mm	800	880 (+67 valve cover)	970	970
Depth	mm	290	340 (+ 110 with footrail)	370 (+ 80 with footrail)	
Height	mm	640	750	845	1,300
Weight	kg	46	60	74	105
Other					
Part no.		064 205	064 033	064 110	064 035

*SPLIT 6: If the refrigerant pipe is more than 15 metres in length, 0.02 kg of refrigerant per metre of pipe must be added.
SPLIT 8/12/16: If the refrigerant pipe is more than 15 metres in length, 0.06 kg of refrigerant per metre of pipe must be added.

SCOP & PDESIGNH

SCOP & Pdesignh according to EN 14825								
Outdoor unit SPLITBox	*Split 6 / SplitBox 6*		*Split 8 / SplitBox 8-12*		*Split 12 / SplitBox 8-12*		*Split 16 / SplitBox 8-12*	
	$P_{designh}$	SCOP	$P_{designh}$	SCOP	$P_{designh}$	SCOP	$P_{designh}$	SCOP
SCOP 35 Average climate	4.8	4.8	8.2	4.38	11.5	4.43	14.5	4.48
SCOP 55 Average climate	5.3	3.46	7.0	3.25	10	3.38	14	3.43
SCOP 35 Cold climate	4.0	3.65	9	3.55	11.5	3.63	15	3.68
SCOP 55 Cold climate	5.6	2.97	10	2.78	13	2.85	16	2.9
SCOP 35 Warm climate	4.2	6.45	8	5.7	12	5.8	15	5.95
SCOP 55 Warm climate	4.76	4.58	8	4.58	12	4.7	15	4.8

ENERGY RATING, TEMPERATE CLIMATE

Model		*Split 6 / SplitBox 6*	*Split 8 / SplitBox 8-12*	*Split 12 / SplitBox 8-12*	*Split 16 / SplitBox 8-12*
Model outdoor unit		*MCU*	*MCU*	*MCU*	*MCU*
Temperature application	*°C*	*35 / 55*	*35 / 55*	*35 / 55*	*35 / 55*
Seasonal space heating energy efficiency of the product[1)]		A++ / A++	A++ / A++	A++ / A++	A++ / A++
Seasonal space heating energy efficiency of the system[2)]		A+++ / A++	A+++ / A++	A+++ / A++	A+++ / A++

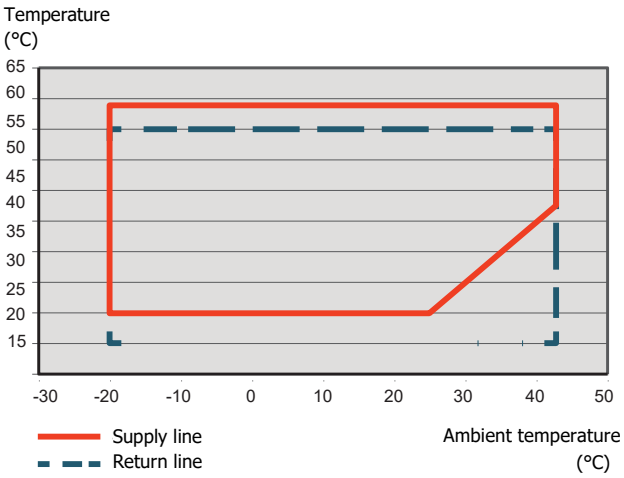
[1]Seasonal space heating energy efficiency of the product on a scale of A++ – G.

[2]Seasonal space heating energy efficiency of the system on a scale of A+++ – G.

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

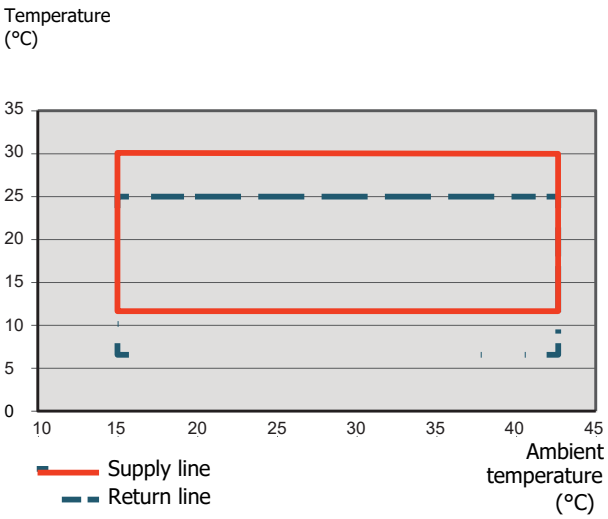
Working area

Compressor operation - heating



Lower operating temperatures are permitted for shorter durations on the heating side, such as during start-up.

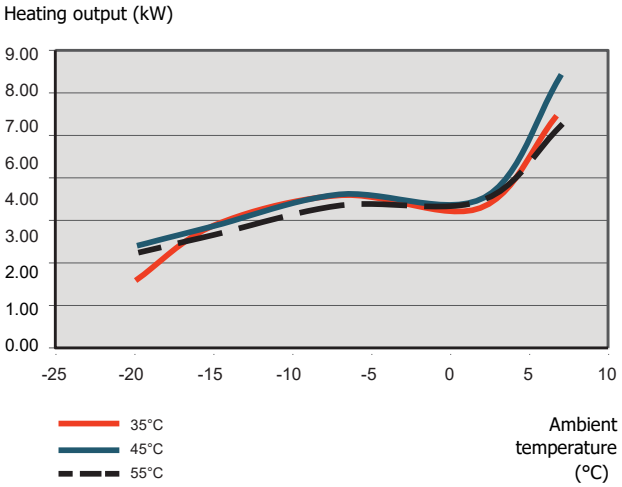
Compressor operation - cooling



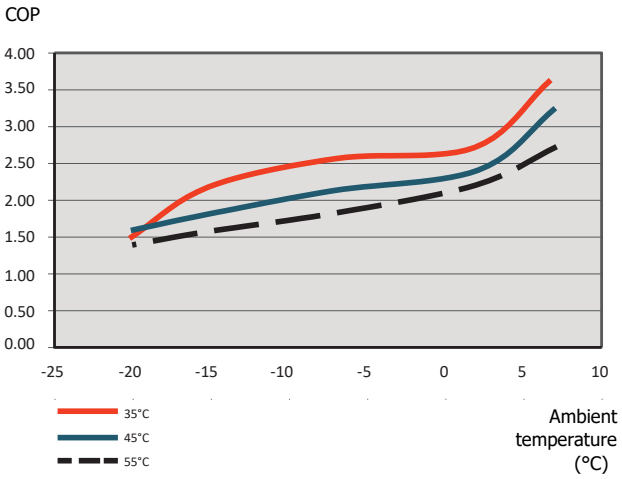
Output and COP

Output and COP at different supply temperatures. Max. specified output incl. defrosting.

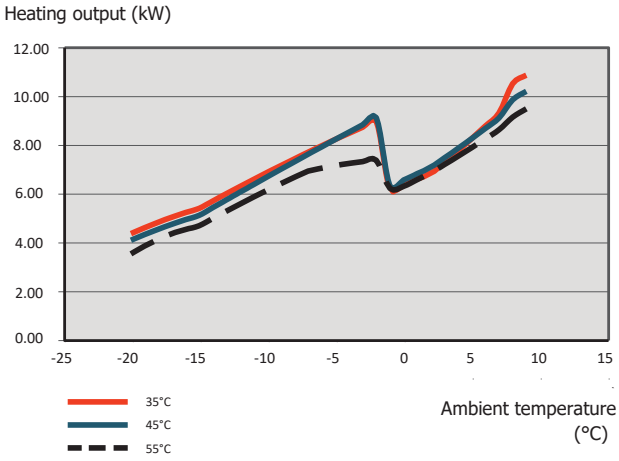
Max. specified output Split 6



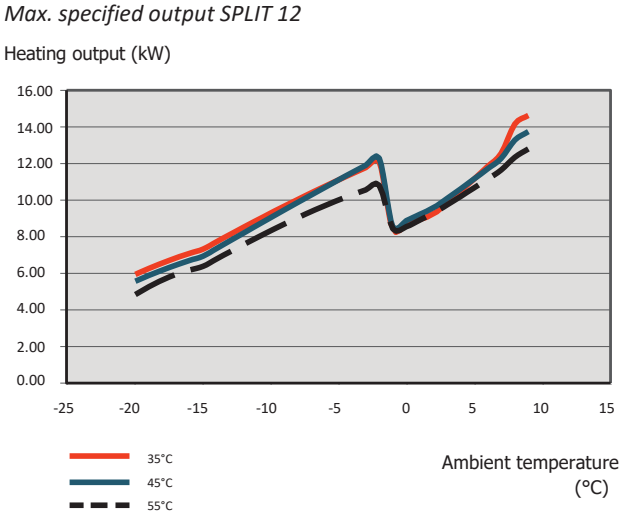
COP SPLIT 6



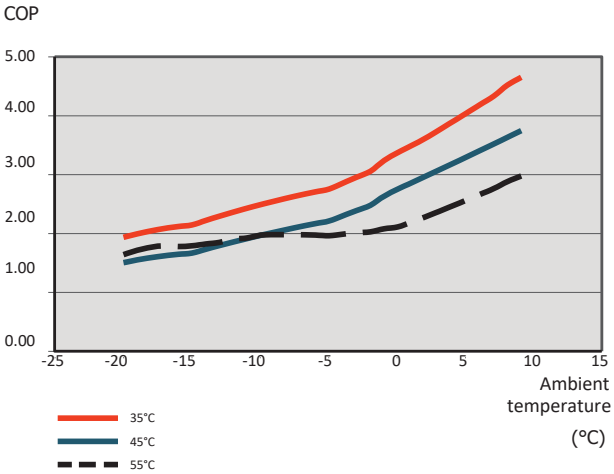
Max. specified output SPLIT 8



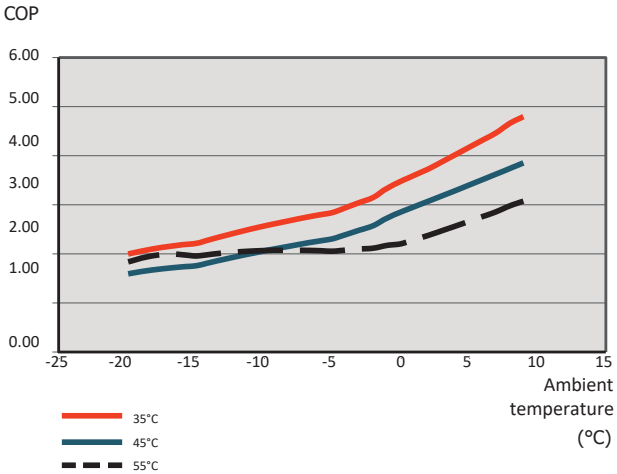
Max. specified output SPLIT 12



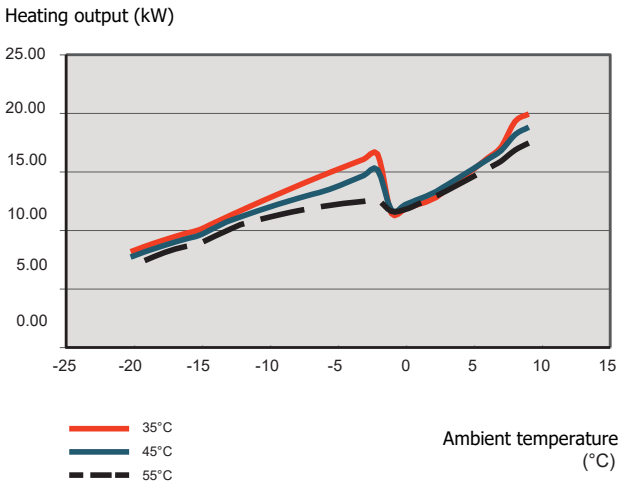
COP SPLIT 8



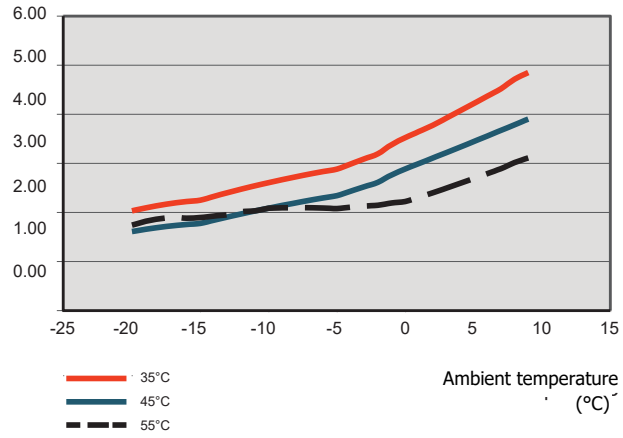
COP SPLIT 12



Max. specified output Split 16

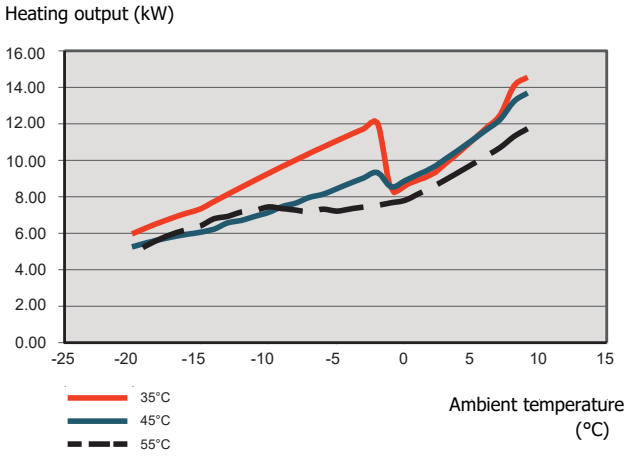


COP SPLIT 16

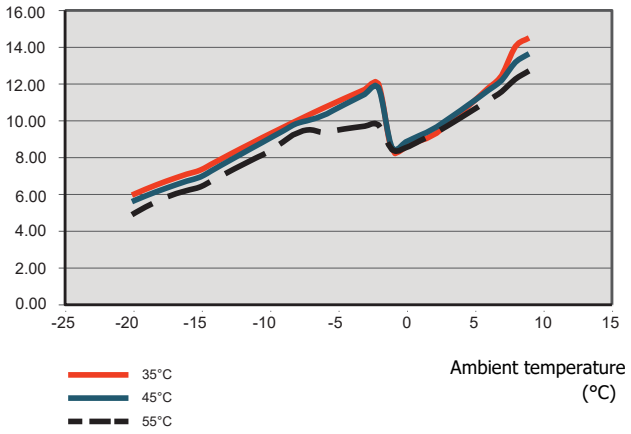


Output with a lower fuse rating than recommended

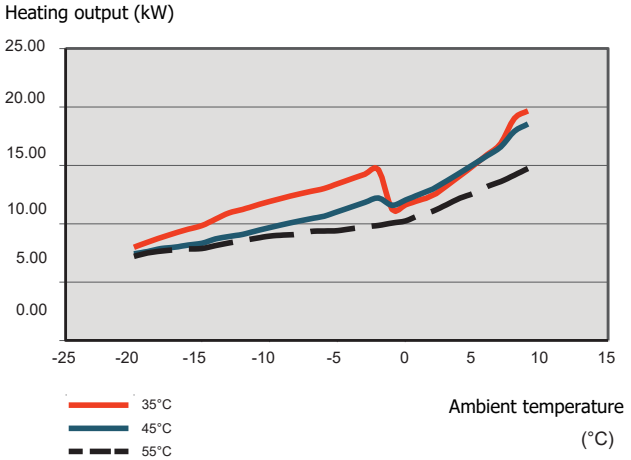
Specified output Split 12 fuse 16A



Specified output Split 12 fuse 20A



Specified output Split 16 fuse 20A



Energy rating

INFORMATION SHEET

Manufacturer		*Kaukora*			
Model		*Split 6 + SplitBox 6*	*Split 8 + SplitBox 8-12*	*Split 12 + SplitBox 8-12*	*Split 16 + SplitBox 16*
Temperature application	*°C*	*35 / 55*	*35 / 55*	*35 / 55*	*35 / 55*
Seasonal space heating energy efficiency class, average climate		A++ / A++	A++ / A++	A++ / A++	A++ / A++
Rated heat output (Pdesignh), average climate	kW	5 / 5	8 / 7	12 / 10	15 / 14
Annual energy consumption space heating, average climate	kWh	2,089 / 3,248	3,882 / 4,447	5,382 / 6,136	6,702 / 8,431
Seasonal space heating energy efficiency, average climate	%	188 / 131	172 / 127	174 / 132	176 / 134
Sound power level LWA indoors	dB	35	35	35	35
Rated heat output (Pdesignh), cold climate	kW	4 / 6	9 / 10	12 / 13	15 / 16
Rated heat output (Pdesignh), warm climate	kW	4 / 5	8 / 8	12 / 12	15 / 15
Annual energy consumption space heating, cold climate	kWh	2,694 / 4,610	6,264 / 8,844	7,798 / 11,197	10,040 / 13,629
Annual energy consumption space heating, warm climate	kWh	872 / 1,398	1,879 / 2,333	2,759 / 3,419	3,370 / 4,183
Seasonal space heating energy efficiency, cold climate	%	143 / 116	139 / 108	142 / 111	144 / 113
Seasonal space heating energy efficiency, warm climate	%	252 / 179	225 / 180	229 / 185	235 / 189
Sound power level L_{WA} outdoors	dB	51	55	58	62

PACKAGE ENERGY EFFICIENCY INFORMATION

Model		*Split 6 + SplitBox 6*	*Split 8 + SplitBox 8-12*	*Split 12 + SplitBox 8-12*	*Split 16 + SplitBox 16*
Model outdoor unit		*SMO*	*SMO*	*SMO*	*SMO*
Temperature application	*°C*	*35 / 55*	*35 / 55*	*35 / 55*	*35 / 55*
Temperature controller, class		VI			
Temperature controller, effect on efficiency	%	4.0			
Seasonal space heating energy efficiency of the package, average climate	%	192 / 135	176 / 131	178 / 136	180 / 138
Seasonal space heating energy efficiency class of the package, average climate		A+++ / A++	A+++ / A++	A+++ / A++	A+++ / A++
Seasonal space heating energy efficiency of the package, cold climate	%	147 / 120	143 / 112	146 / 115	148 / 117
Seasonal space heating energy efficiency of the package, warm climate	%	256 / 183	229 / 184	233 / 189	239 / 193

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

TECHNICAL DOCUMENTATION

Model		*Split 6 + SplitBox 6*					
Heat pump type		☒ Air-water Exhaust ☐ air-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		☒ Temperature application ☐ Cold ☐ Warm					
Temperature application		☒ Average (55 °C) ☐ Low (35 °C)					
Applicable standards		EN14511 / EN14825 / EN12102					
Rated heat output	Prated	5.3	kW	*Seasonal space heating energy efficiency*	η_s	131	%
Declared capacity for space heating at part load and at ambient temperature Tj				*Declared coefficient of performance for space heating at part load and at ambient temperature Tj*			
Tj = -7 °C	Pdh	4.7	kW	Tj = -7 °C	COPd	1.88	-
Tj = +2 °C	Pdh	2.8	kW	Tj = +2 °C	COPd	3.26	-
Tj = +7 °C	Pdh	1.8	kW	Tj = +7 °C	COPd	4.72	-
Tj = +12 °C	Pdh	2.7	kW	Tj = +12 °C	COPd	6.47	-
Tj = biv	Pdh	4.7	kW	Tj = biv	COPd	1.88	-
Tj = TOL	Pdh	4.1	kW	Tj = TOL	COPd	1.77	-
Tj = -15 °C (jos TOL < -20 °C)	Pdh		kW	Tj = -15 °C (jos TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-7	°C	Min. ambient temperature	TOL	-10	°C
Capacity in cycling	Pcych		kW	COP in cycling	COPcyc		-
Degradation coefficient	Cdh	0.99	-	Max. water supply temperature	WTOL	58	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.007	kW	Rated heat output	Psup	1.2	kW
Thermostat off mode	P_{TO}	0.012	kW				
Standby	P_{SB}	0.012	kW	Energy input type	Electricity		
Crank case heater mode	P_{CK}	0	kW				
Other data							
Capacity control	Variable			Rated airflow (air-water)		2,526	m^3/h
Sound power level, indoors/outdoors	L_{WA}	35 / 51	dB	Nominal heating medium flow			m^3/h
Annual energy consumption	Q_{HE}	3,248	kWh	Heat collection flow brine-water or water-water heat pumps			m^3/h
Contact details	*Kaukora Oy Tuotekatu 11, 21200 Raisio FINLAND*						

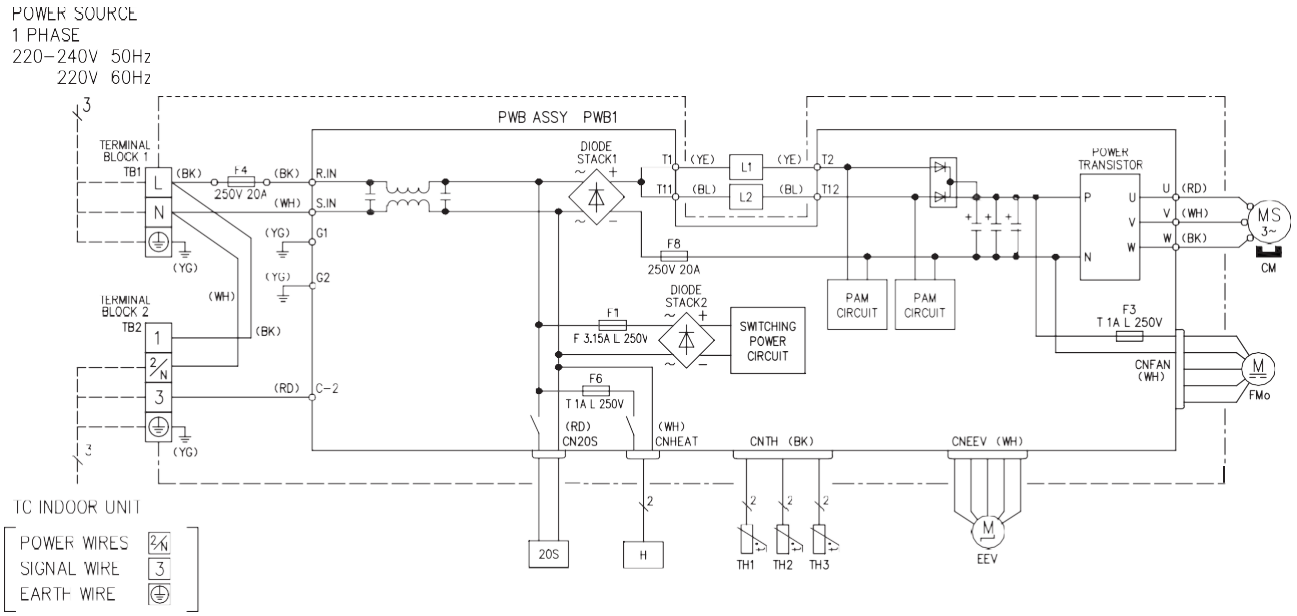
Model		*Split 8 + SplitBox 8-12*					
Heat pump type		☒ Air-water ☐ Exhaust air-water ☐ Brine-water ☐ Water-water					
Low-temperature heat pump		☐ Yes ☒ No					
Integrated immersion heater for additional heat		☐ Yes ☒ No					
Heat pump combination heater		☐ Yes ☒ No					
Climate		☒ Average ☐ Cold ☐ Warm					
Temperature application		☒ Average (55 °C) ☐ Low (35 °C)					
Applicable standards		EN14825 / EN14511 / EN12102					
Rated heat output	Prated	7	kW	*Seasonal space heating energy efficiency*	η_s	127	%
Declared capacity for space heating at part load and at ambient temperature Tj				*Declared coefficient of performance for space heating at part load and at ambient temperature Tj*			
Tj = -7 °C	Pdh	6.3	kW	Tj = -7 °C	COPd	1.94	-
Tj = +2 °C	Pdh	3.9	kW	Tj = +2 °C	COPd	3.11	-
Tj = +7 °C	Pdh	2.6	kW	Tj = +7 °C	COPd	4.42	-
Tj = +12 °C	Pdh	3.7	kW	Tj = +12 °C	COPd	5.93	-
Tj = biv	Pdh	6.6	kW	Tj = biv	COPd	1.83	-
Tj = TOL	Pdh	5.9	kW	Tj = TOL	COPd	1.86	-
Tj = -15 °C (jos TOL < -20 °C)	Pdh		kW	Tj = -15 °C (jos TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-9	°C	Min. ambient temperature	TOL	-10	°C
Capacity in cycling	Pcych		kW	COP in cycling	COPcyc		-
Degradation coefficient	Cdh	0.97	-	Max. water supply temperature	WTOL	58	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.002	kW	Rated heat output	Psup	1.1	kW
Thermostat off mode	P_{TO}	0.010	kW				
Standby	P_{SB}	0.015	kW	Energy input type		Electricity	
Crank case heater mode	P_{CK}	0.030	kW				
Other data							
Capacity control		Variable		Rated airflow (air-water)		3,000	m3/h
Sound power level, indoors/outdoors	L_{WA}	35 / 55	dB	Nominal heating medium flow		0.60	m3/h
Annual energy consumption	Q_{HE}	4,447	kWh	Heat collection flow brine-water or water-water heat pumps			m3/h
Contact details	*Kaukora Oy Tuotekatu 11, 21200 Raisio FINLAND*						

Model		*Split 12 + SplitBox 8-12*					
Heat pump type		☒ Air-water ☐ Exhaust air-water ☐ Brine-water ☐ Water-water					
Low-temperature heat pump		☐ Yes ☒ No					
Integrated immersion heater for additional heat		☐ Yes ☒ No					
Heat pump combination heater		☐ Yes ☒ No					
Climate		☒ Average ☐ Cold ☐ Warm					
Temperature application		☒ Average (55 °C) ☐ Low (35 °C)					
Applicable standards		EN14825 / EN14511 / EN12102					
Rated heat output	Prated	10	kW	*Seasonal space heating energy efficiency*	η_s	132	%
Declared capacity for space heating at part load and at ambient temperature Tj				*Declared coefficient of performance for space heating at part load and at ambient temperature Tj*			
Tj = -7 °C	Pdh	8.9	kW	Tj = -7 °C	COPd	1.99	-
Tj = +2 °C	Pdh	5.5	kW	Tj = +2 °C	COPd	3.22	-
Tj = +7 °C	Pdh	3.5	kW	Tj = +7 °C	COPd	4.61	-
Tj = +12 °C	Pdh	5.0	kW	Tj = +12 °C	COPd	6.25	-
Tj = biv	Pdh	9.2	kW	Tj = biv	COPd	1.90	-
Tj = TOL	Pdh	8.1	kW	Tj = TOL	COPd	1.92	-
Tj = -15 °C (jos TOL < -20 °C)	Pdh		kW	Tj = -15 °C (jos TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-8	°C	Min. ambient temperature	TOL	-10	°C
Capacity in cycling	Pcych		kW	COP in cycling	COPcyc		-
Degradation coefficient	Cdh	0.98	-	Max. water supply temperature	WTOL	58	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.002	kW	Rated heat output	Psup	1.9	kW
Thermostat off mode	P_{TO}	0.014	kW				
Standby	P_{SB}	0.015	kW	Energy input type		Electricity	
Crank case heater mode	P_{CK}	0.035	kW				
Other data							
Capacity control		Variable		Rated airflow (air-water)		4,380	m3/h
Sound power level, indoors/outdoors	L_{WA}	35 / 58	dB	Nominal heating medium flow		0.86	m3/h
Annual energy consumption	Q_{HE}	6,136	kWh	Heat collection flow brine-water or water-water heat pumps			m3/h
Contact details	*Kaukora Oy Tuotekatu 11, 21200 Raisio FINLAND*						

Model		*Split 16 + SplitBox 16*					
Heat pump type		☒ Air-water ☐ Exhaust air-water ☐ Brine-water ☐ Water-water					
Low-temperature heat pump		☐ Yes ☒ No					
Integrated immersion heater for additional heat		☐ Yes ☒ No					
Heat pump combination heater		☐ Yes ☒ No					
Climate		☒ Average ☐ Cold ☐ Warm					
Temperature application		☒ Average (55 °C) ☐ Low (35 °C)					
Applicable standards		EN14825 / EN14511 / EN12102					
Rated heat output	Prated	14	kW	*Seasonal space heating energy efficiency*	η_s	134	%
Declared capacity for space heating at part load and at ambient temperature Tj				*Declared coefficient of performance for space heating at part load and at ambient temperature Tj*			
Tj = -7 °C	Pdh	12.5	kW	Tj = -7 °C	COPd	2.01	-
Tj = +2 °C	Pdh	7.6	kW	Tj = +2 °C	COPd	3.29	-
Tj = +7 °C	Pdh	4.9	kW	Tj = +7 °C	COPd	4.68	-
Tj = +12 °C	Pdh	6.8	kW	Tj = +12 °C	COPd	6.51	-
Tj = biv	Pdh	12.7	kW	Tj = biv	COPd	1.95	-
Tj = TOL	Pdh	11.0	kW	Tj = TOL	COPd	1.95	-
Tj = -15 °C (jos TOL < -20 °C)	Pdh		kW	Tj = -15 °C (jos TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-8	°C	Min. ambient temperature	TOL	-10	°C
Capacity in cycling	Pcych		kW	COP in cycling	COPcyc		-
Degradation coefficient	Cdh	0.98	-	Max. water supply temperature	WTOL	58	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.002	kW	Rated heat output	Psup	1.2	kW
Thermostat off mode	P_{TO}	0.016	kW				
Standby	P_{SB}	0.015	kW	Energy input type		Electricity	
Crank case heater mode	P_{CK}	0.035	kW				
Other data							
Capacity control		Variable		Rated airflow (air-water)		6,000	m3/h
Sound power level, indoors/outdoors	L_{WA}	35 / 62	dB	Nominal heating medium flow		1.21	m3/h
Annual energy consumption	Q_{HE}	8,431	kWh	Heat collection flow brine-water or water-water heat pumps			m3/h
Contact details	*Kaukora Oy Tuotekatu 11, 21200 Raisio FINLAND*						

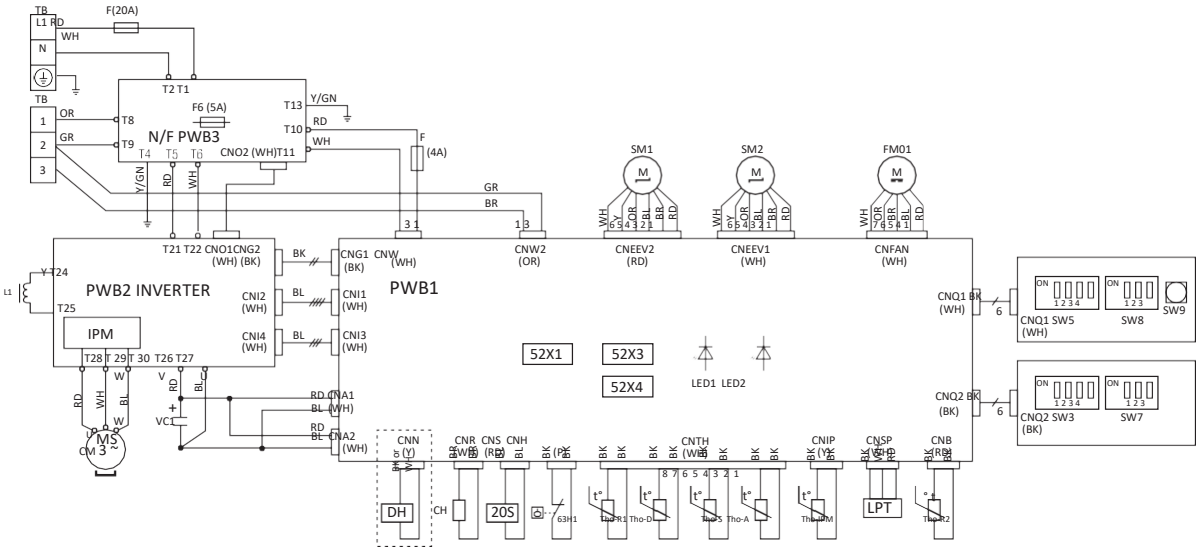
Electrical schematic

SPLIT 6



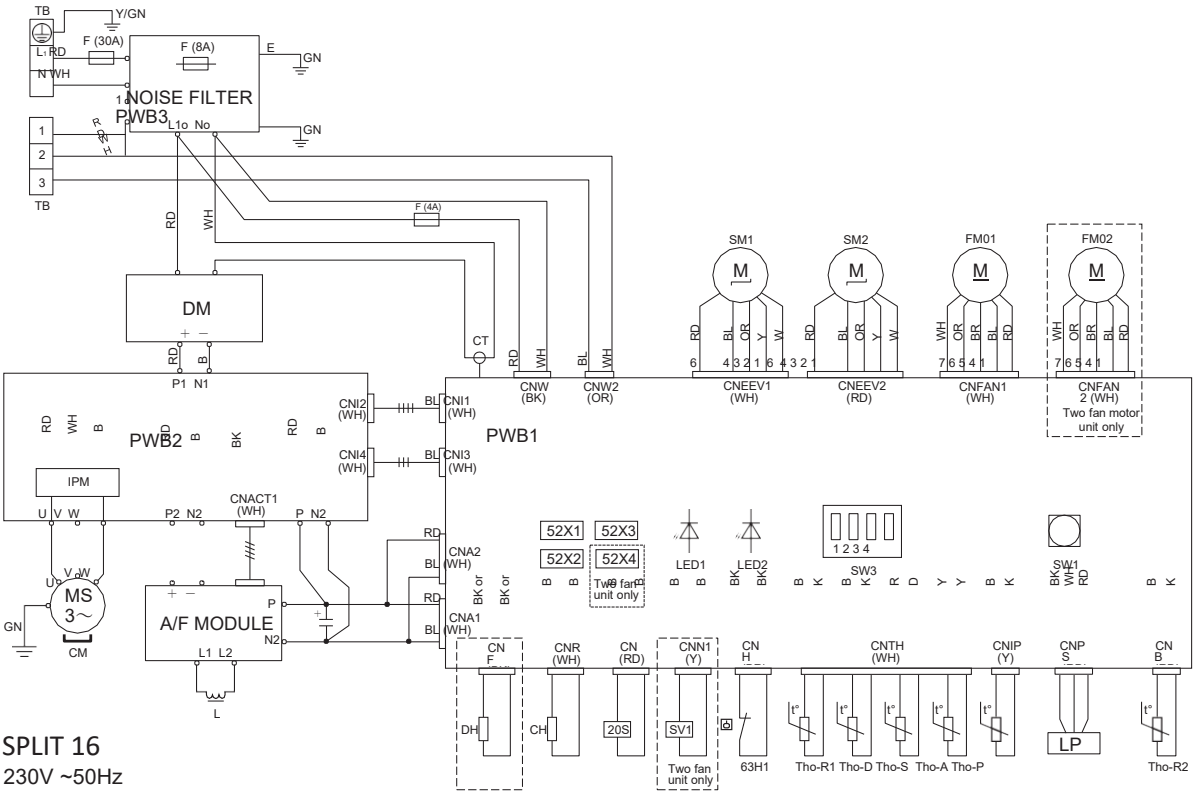
SPLIT 8

230V ~50Hz



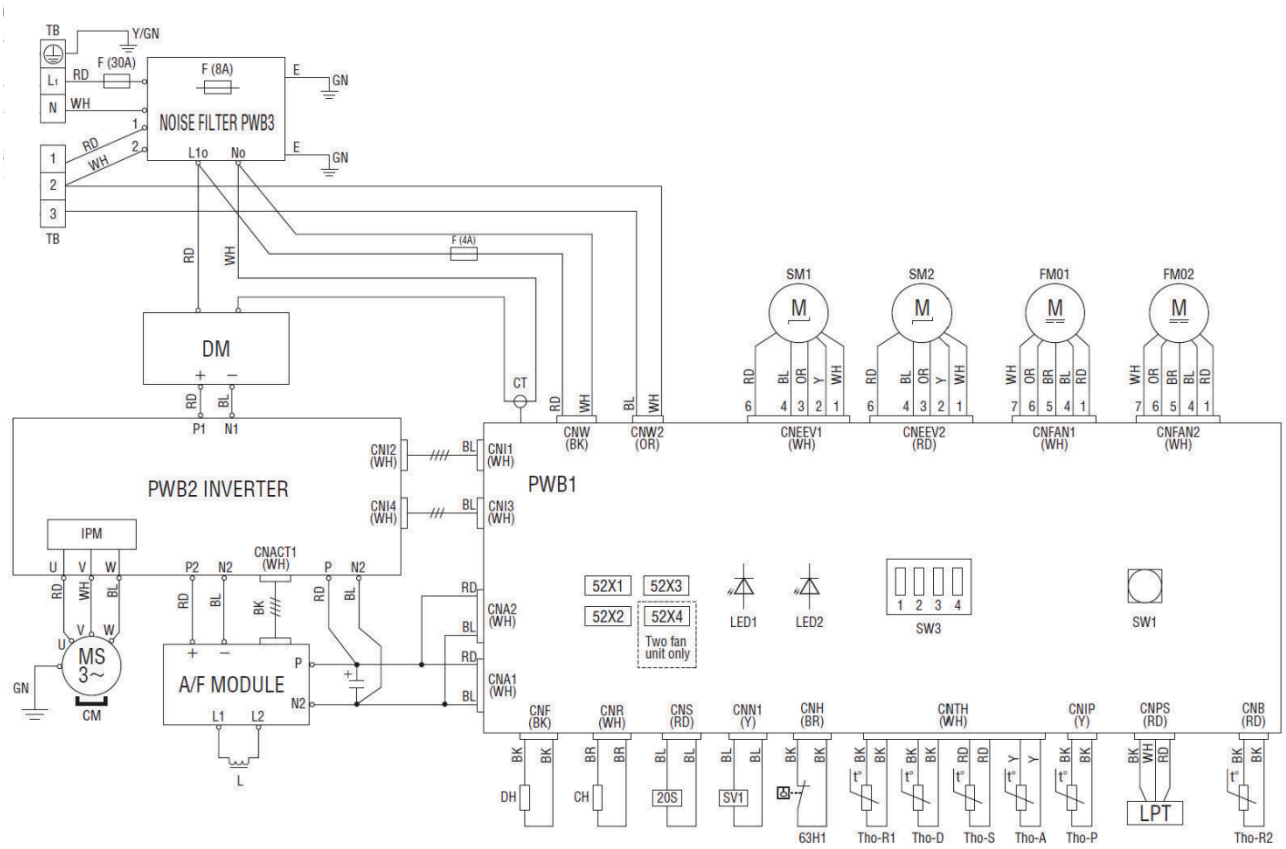
SPLIT 12

230V ~50Hz



SPLIT 16

230V ~50Hz



Markings	*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	Ylipaineensäädin
C1	Capacitor
CH	Compressor heater
CM	Compressor motor
CnA~Z	Terminal block
CT	Current sensor
DH	Drip tray 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)	Expansion valve, heating
QN3 (EEV-C)	Expansion valve, cooling
SW1, 9	Refrigerant recovery
SW3, 5, 7, 8	Local settings
TB	Terminal block
BT28 (Tho-A)	Temperature sensor, outdoor air
Tho-D	Temperature sensor, hot gas
Tho-R1	Temperature sensor, heat exchanger (out)
Tho-R2	Temperature sensor, heat exchanger (in)
Tho-S	Temperature sensor, suction gas
Tho-P	Temperature sensor, IPM

Contact details

Kaukora Oy
Tuotekatu 11
21200 Raisio

FINLAND

www.jaspi.fi