

Air/Water Heat Pumps  
Outdoor installation

# Operating Manual

## L...Split – series





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# 1 Important information

## Installation data

Produkt	L...Split
Serial number	
Service code	
Installation date	
Installer	

Always specify the service code and serial number.

Certification that the installation is carried out according to instructions in the installer manual and applicable regulations.

Date \_\_\_\_\_ Signed \_\_\_\_\_

## 1.1 Safety information

This manual describes installation and service procedures for implementation by specialists. The manual must be left with the customer.

## 1.2 Personnel qualifications

All instructional information in this operating manual is solely directed at qualified, skilled personnel.

Only qualified, skilled personnel are able to carry out the work on the unit safely and correctly. Interference by unqualified personnel can cause life-threatening injuries and damage to property.

- ▶ Ensure that the personnel are familiar with the local regulations, especially those on safe and hazard-aware working.
- ▶ Only allow qualified personnel with “electrical” training to carry out work on the electrical and electronic systems.
- ▶ Allow qualified, skilled personnel only to do any other work on the system, e.g.
  - Heating installer
  - Plumbing installer
  - Refrigeration system installer (maintenance work)



## 1.3 Symbols



### NOTE

This symbol indicates danger to person or machine.



### CAUTION

This symbol indicates important information about what you should observe when maintaining your installation.



### TIP

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

## 1.4 Safety precautions

### CAUTION

**Install the system in full accordance with this installation manual.**

Incorrect installation can cause bursts, personal injury, water leaks, refrigerant leaks, electric shocks and fire.

**Pay attention to the measurement values before working on the cooling system, especially when servicing in small rooms, so that the limit for the refrigerant's concentration is not exceeded.**

Consult an expert to interpret the measurement values. If the refrigerant concentration exceeds the limit, there may be a shortage of oxygen in the event of any leak, which can cause serious injury.

**Use original accessories and the stated components for the installation.**

If parts other than those stated by us are used, water leaks, electric shocks, fire and personal injury may occur as the unit may not work properly.

**Ventilate the working area well – refrigerant leakage may occur during service work.**

If the refrigerant comes into contact with naked flames, poisonous gas is created.

**Install the unit in a location with good support.**

Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury. Installation without sufficient support can also cause vibrations and noise.

**Ensure that the unit is stable when installed, so that it can withstand earthquakes and strong winds.**

Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.

**The electrical installation must be carried out by a qualified electrician and the system must be connected as a separate circuit.**

Power supply with insufficient capacity and incorrect function can cause electric shocks and fire.

**Use the stated cables for the electrical connection, tighten the cables securely in the terminal blocks and relieve the wiring correctly to prevent overloading the terminal blocks.**

Loose connections or cable mountings can cause abnormal heat production or fire.



**Check, after completed installation or service, that no refrigerant leaks from the system in gas form.** If refrigerant gas leaks into the house and comes into contact with an aerotemp, an oven or other hot surface, poisonous gases are produced.

**Switch off the compressor before opening/breaching the refrigerant circuit.**

If the refrigerant circuit is breached /opened whilst the compressor is running, air can enter the process circuit. This can cause unusually high pressure in the process circuit, which can cause bursts and personal injury.

**Switch off the power supply in the event of a service or inspection.**

If the power supply is not shut off, there is a risk of electric shocks and damage due to the rotating fan.

**Do not run the unit with removed panels or protection.**

Touching rotating equipment, hot surfaces or high voltage parts can cause personal injury due to entrapment, burns or electric shocks.

**Cut the power before starting electrical work.**

Failure to cut the power can cause electric shocks, damage and incorrect function of the equipment.

## CARE

**Carry out the electrical installation with care.**

Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting.

**Use main switch with sufficient breaking capacity.**

If the switch does not have sufficient breaking capacity, malfunctions and fire can occur.

**Always use a fuse with the correct rating in the locations where fuses are to be used.**

Connecting the unit with copper wire or other metal thread can cause unit breakdown and fire.

**Cables must be routed so that they are not damaged by metal edges or trapped by panels.**

Incorrect installation can cause electric shocks, heat generation and fire.

**Do not install the unit in close proximity to locations where leakage of combustible gases can occur.** If leaking gases collect around the unit, fire may occur.

**Do not install the unit where corrosive gas (for example nitrous fumes) or combustible gas or steam (for example thinner and petroleum gases) can build up or collect, or where volatile combustible substances are handled.**

Corrosive gas can cause corrosion to the heat exchanger, breaks in plastic parts etc. and combustible gas or steam can cause fire.

**Do not use the unit where water splashes may occur, for example in laundries.**

The indoor section is not waterproof and electric shocks and fire can therefore occur.

**Do not use the unit for specialist purposes such as for storing food, cooling precision instruments, freeze-conservation of animals, plants or art.**

This can damage the items.

**Do not install and use the system close to equipment that generates electromagnetic fields or high frequency harmonics.**

Equipment such as inverters, standby sets, medical high frequency equipment and telecommunications equipment can affect the unit and cause malfunctions and breakdowns. The unit can also affect medical equipment and telecommunications equipment, so that it functions incorrectly or not at all.

**Do not install the outdoor unit in the locations stated below.**

- Locations where leakage of combustible gas can occur.
- Locations where carbon fibre, metal powder or other powder that can enter the air.
- Locations where substances that can affect the unit, for example, sulphide gas, chlorine, acid or alkaline substances can occur.
- Locations with direct exposure to oil mist or steam.
- Vehicles and ships.
- Locations where machines that generate high frequency harmonics are used.
- Locations where cosmetic or special sprays are often used.
- Locations that can be subjected to direct salty atmospheres. In this case, the outdoor unit must be protected against direct intakes of salty air.
- Locations where large amounts of snow occur.
- Locations where the system is exposed to chimney smoke.



**If the bottom frame of the outdoor section is corroded, or in any other way damaged, due to long periods of operation, it must not be used.**

Using an old and damaged frame can cause the unit to fall and cause personal injury.

**If soldering near the unit, ensure that solder residue does not damage the drip tray.**

If solder residue enters the unit during soldering, small holes can appear in the tray resulting in water leakage. To prevent damage, keep the indoor unit in its packing or cover it.

**Do not allow the drainage pipe to exit into channels where poisonous gases, containing sulphides for example, can occur.**

If the pipe exits into such a channel, any poisonous gases will flow into the room and seriously affect the user's health and safety.

**Insulate the unit's connection pipes so that the ambient air moisture does not condense on them.**

Insufficient insulation can cause condensation, which can lead to moisture damage on the roof, floor, furniture and valuable personal property.

**Do not install the outdoor unit in a location where insects and small animals can inhabit.**

Insects and small animals can enter the electronic parts and cause damage and fire. Instruct the user to keep the surrounding equipment clean.

**Take care when carrying the unit by hand.**

If the unit weighs more than 20 kg, it must be carried by two people. Wear safety gloves to minimise the risk of cuts.

**Dispose of any packaging material correctly.**

Any remaining packaging material can cause personal injury as it may contain nails and wood.

**Do not touch any buttons with wet hands.**

This can cause electric shocks.

**Do not touch any refrigerant pipes with your hands when the system is in operation.**

During operation the pipes become extremely hot or extremely cold, depending on the method of operation. This can cause burn injuries or frost injuries.

**Do not shut off the power supply immediately after operation has started.**

Wait at least 5 minutes, otherwise there is a risk of water leakage or breakdown.

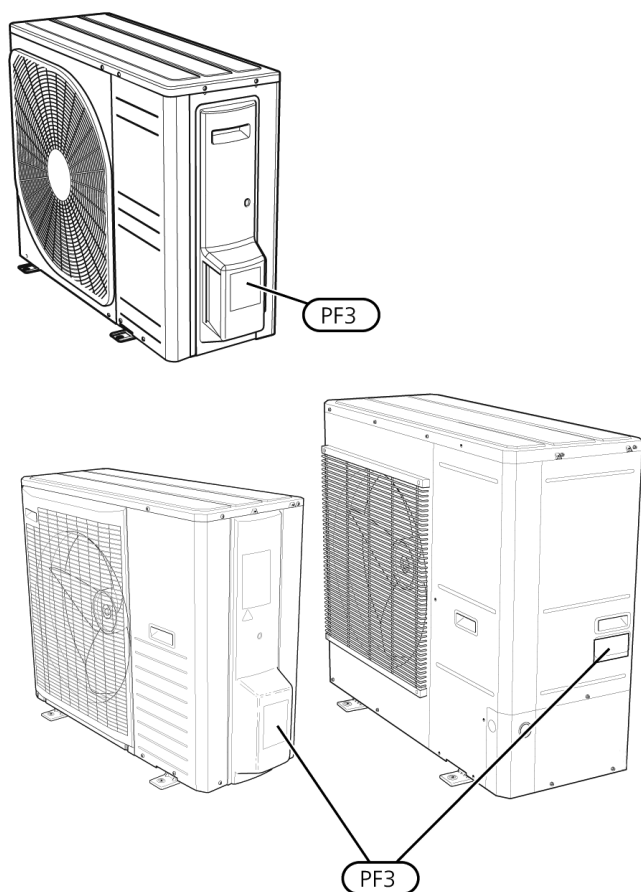
**Do not control the system with the main switch.**

This can cause fire or water leakage. In addition, the fan can start unexpectedly, which can cause personal injury.



## 1.5 Serial number

You can find the service code and the serial number (PF3) on the right-hand side of L...Split.



### CAUTION

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

## 1.6 Maintenance of L...Split

### Regular checks

Your HSV Split only requires minimal maintenance. The condensation hose should be checked to ensure that condensation can run out to a drain. If there is any suspicion of leakage, pipe connections on L...Split should be checked.



### NOTE

Insufficient oversight can cause serious damage to L...Split which is not covered by the guarantee.

### Checking grilles and bottom panel on L...Split

Check that the inlet grille is not clogged by leaves, snow or anything else regularly throughout the year.

You should be vigilant during windy conditions and/or in the event of snow as the grilles can become blocked.

Also check that the drain holes in the bottom panel (three) are free from dirt and leaves.

Regularly check that condensation is routed away correctly through the condensation pipe. Ask your installer for assistance if required.

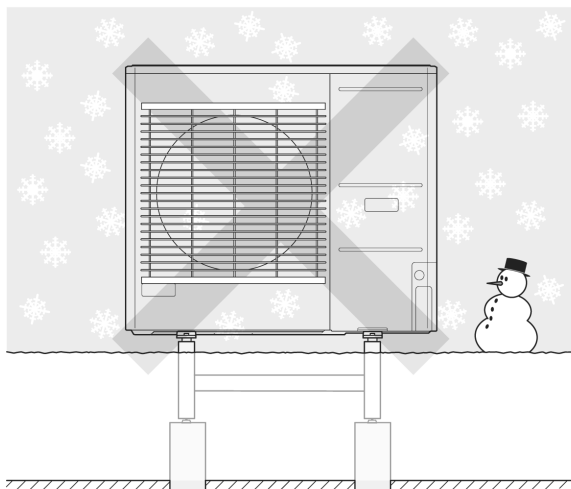
### Cleaning the outer casing

If necessary the outer casing can be cleaned using a damp cloth. Care must be exercised so that the heat pump is not scratched when cleaning. Avoid spraying water into the grilles or the sides so that water penetrates into L...Split. Prevent L...Split coming into contact with alkaline cleaning agents.

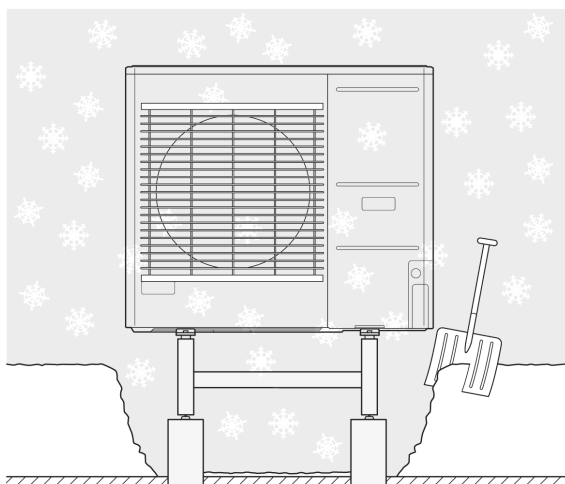




## Keep free of snow and ice



Prevent snow from building up and covering the grilles and drain holes on L...Split.



Keep free of snow and/or ice.

## Silent mode

The heat pump can be set to "silent mode", which reduces the heat pump's noise level. The function is useful when L...Split must be placed in noise sensitive areas. The function should only be used for limited periods as L...Split may not reach its dimensioned output.

## Saving tips

Your heat pump installation produces heat and cooling and/or hot water. This occurs via the control settings you made.

Factors that affect the energy consumption are, for example, indoor temperature, hot water consumption, the insulation level of the house and whether the house has many large window surfaces. The position of the house, e.g. wind exposure is also an affecting factor.

### Also remember:

- Open the thermostat valves completely (except in the rooms that are to be kept cooler for various reasons, e.g. bedrooms). The thermostats slow the flow in the heating system, which the heat pump wants to compensate with increased temperatures. It then works harder and consumes more electrical energy.
- Reduce or adjust the settings for heating in any external control systems.

## 1.7 Recovery



Leave the disposal of the packaging to the installer who installed the product or to special waste stations.



Do not dispose of used products with normal household waste. It must be disposed of at a special waste station or dealer who provides this type of service.

Improper disposal of the product by the user results in administrative penalties in accordance with current legislation.

## 1.8 Environmental information

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

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





## 1.9 Checklist: Checks before commissioning

Refrigerant system	Notes	Checked
Pipe length		<input type="checkbox"/>
Height difference		<input type="checkbox"/>
Pressurization test		<input type="checkbox"/>
Leak testing		<input type="checkbox"/>
End pressure vacuum		<input type="checkbox"/>
Pipe insulation		<input type="checkbox"/>

Electrical installation	Notes	Checked
Property's main fuse		<input type="checkbox"/>
Group fuse		<input type="checkbox"/>
Load monitor / current sensor (Connects to indoor module / control module.)		<input type="checkbox"/>
KWS		<input type="checkbox"/>
When installing L6 Split / HSV Split 6, check that the software version of the indoor module/ control module is at least v8320.		<input type="checkbox"/>

Cooling	Notes	Checked
Pipe system, condensation insulation		<input type="checkbox"/>



## 2 Delivery and handling

### 2.1 Transport and storage

L...Split must be transported and stored vertically.

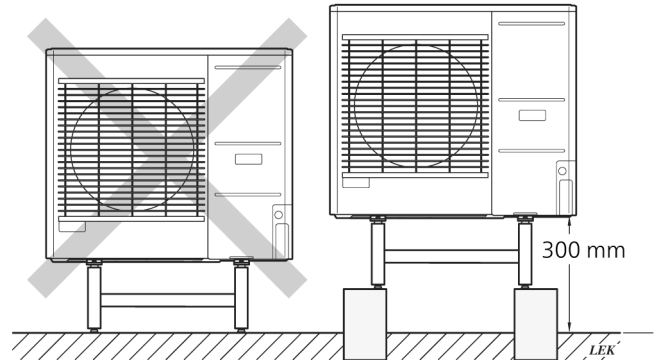


#### NOTE

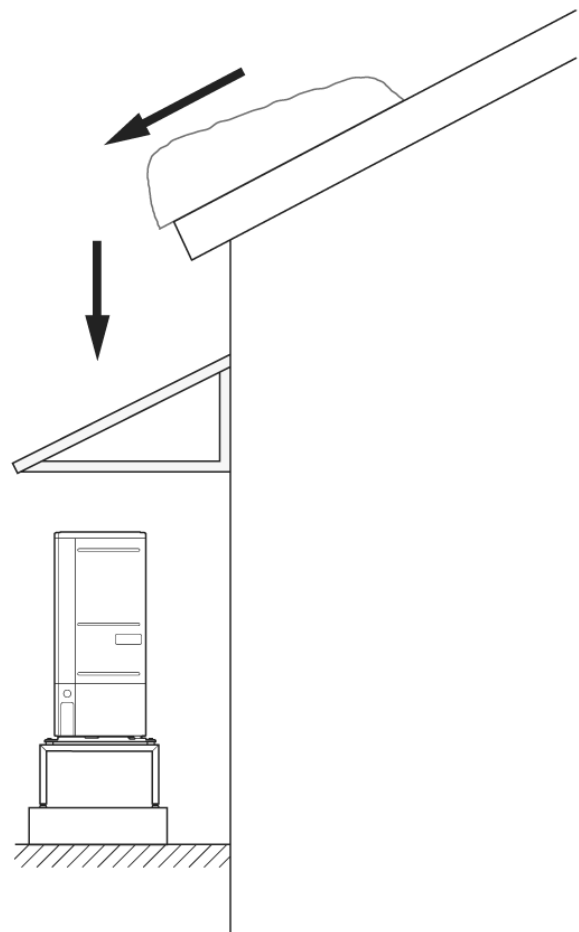
Ensure that the heat pump cannot fall over during transport.

### 2.2 Assembly

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



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



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



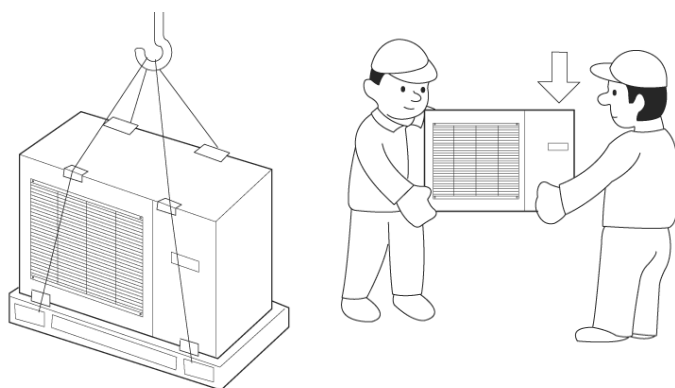
## Lift from the street to the set up location

If the base allows, the simplest thing is to use a pallet truck to move the L...Split to the set up location.



### NOTE

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



If L...Split needs to be transported across soft ground, such as a lawn, we recommend that a crane truck is used that can lift the unit to the installation location. When L...Split is lifted with a crane, the packaging must be undamaged and the load distributed with a boom, see the illustration above.

If a crane cannot be used L...Split can be transported using an extended sack truck. L...Split must be used on the side marked "heavy side" and two people are required to get the L...Split up.

## Lift from the pallet to final positioning

Before lifting remove the packaging and the securing strap to the pallet.

Place lifting straps around each machine foot. Lifting from the pallet to the base requires four persons, one for each lifting strap.

It is not permitted to lift anything other than the machine feet.

## Scrapping

When scrapping, the product is removed in reverse order. Lift by the bottom panel instead of a pallet!

## Condensation run off

Condensation runs out on to the ground below L...Split. To avoid damage to the house and heat pump, the condensation must be gathered and drained away.



### NOTE

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



### NOTE

To ensure this function, the accessory KWS should be used. (Not included)



### NOTE

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



### NOTE

Self regulating heating cables must not be connected.

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



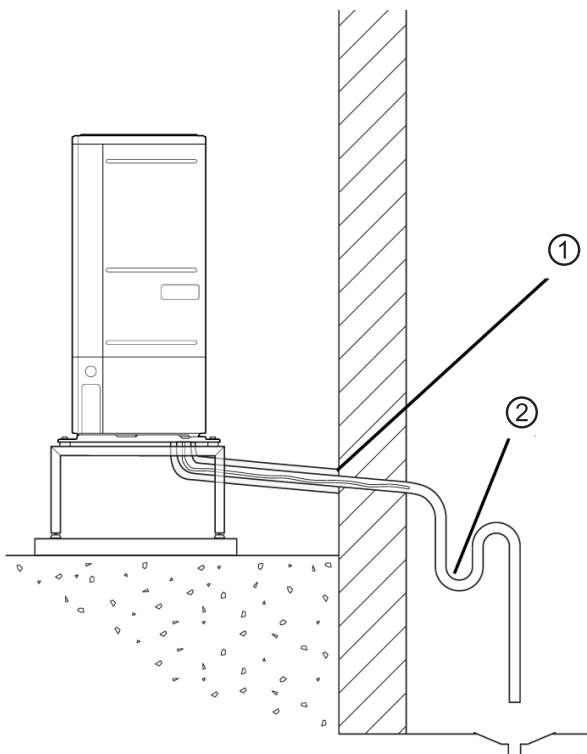
## Drain pan heater, control

The drain pan heater is supplied with power when one of the following conditions is met:

1. The compressor has been in operation for at least 30 minutes after last start..
2. The ambient temperature is lower than 1 °C.

## Recommended alternative for leading off condensation water

### Drain indoors



1	Joint
2	Water seal

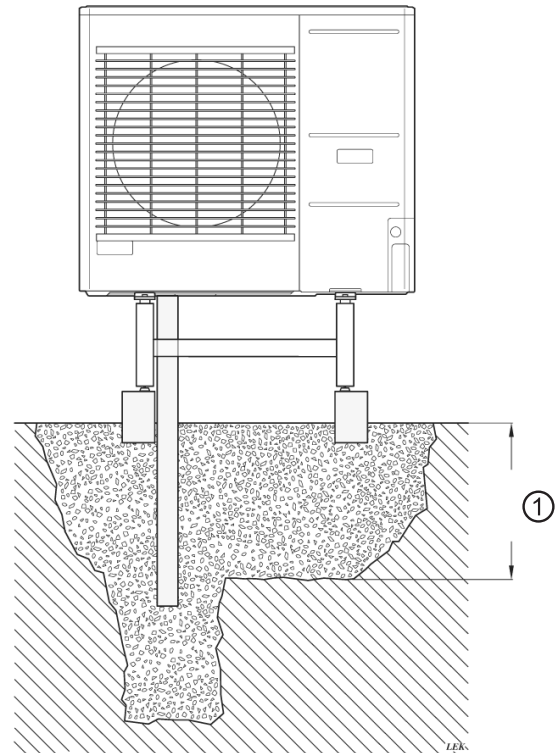
The condensation water is lead to an indoor drain (subject to local rules and regulations).

Route the pipe downward from the air/water heat pump.

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

KWS spliced as illustrated. Pipe routing inside house not included.

## Stone caisson



1	Frost proof depth
---	-------------------

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

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



## Gutter drainage



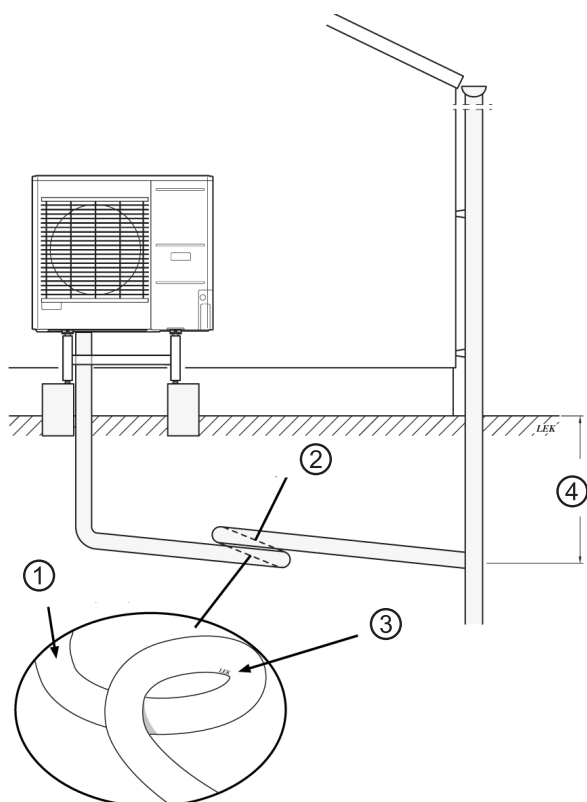
### NOTE

Bend the hose to create a water seal, see illustration.



### CAUTION

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



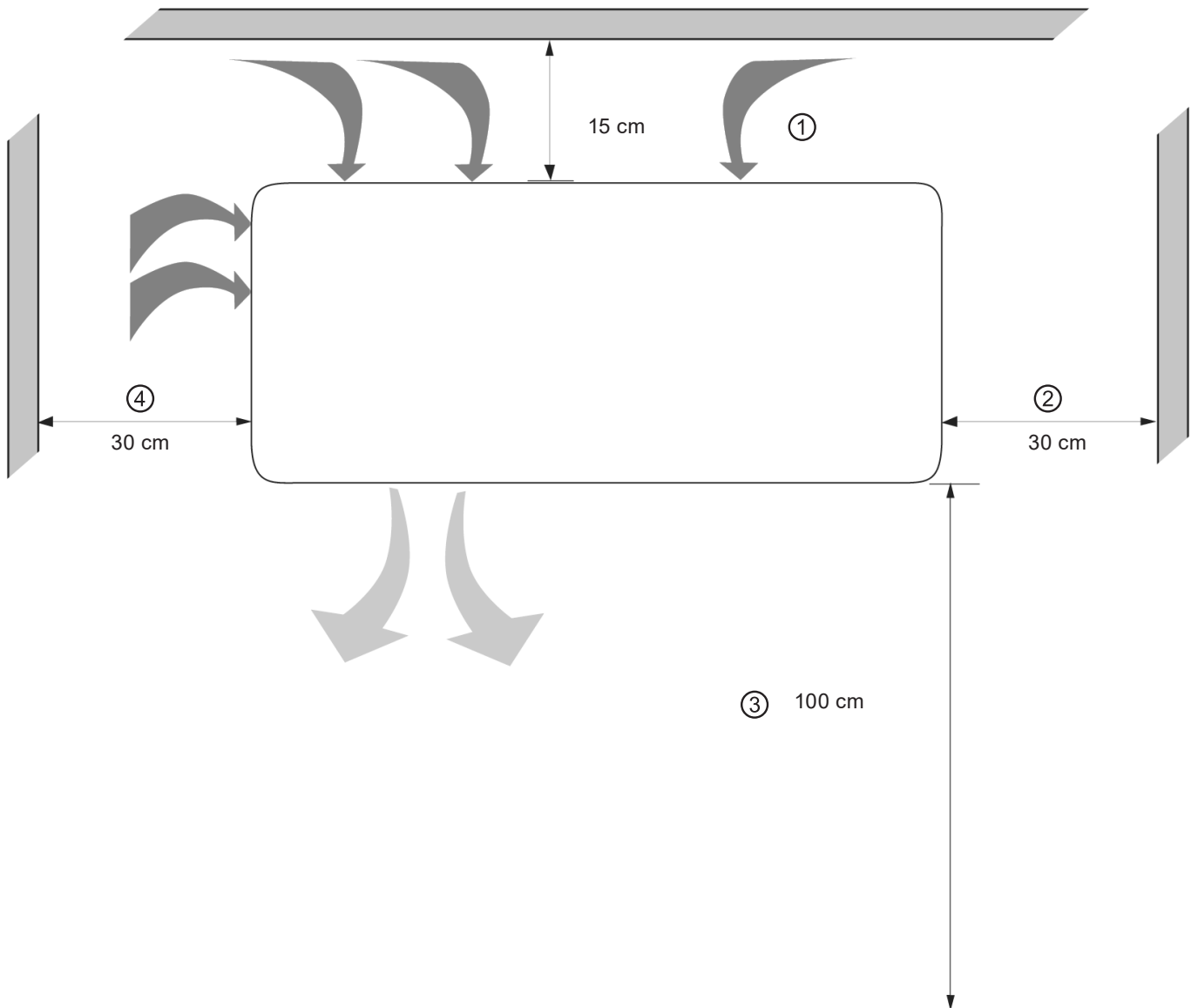
1	From air/water heat pump
2	Water seal
3	Water seal
4	Frost free depth

- The outlet of the condensation water pipe must be at frost free depth.
- Route the pipe downward from the air/water heat pump.
- The condensation water pipe must have a water seal to prevent air circulation in the pipe.
- The installation length can be adjusted by the size of the water seal.



## Installation area

The recommended distance between L...Split and the house wall must be at least 15 cm. Clearance above L...Split should be at least 100 cm. However, free space in front must be 100 cm for future servicing.

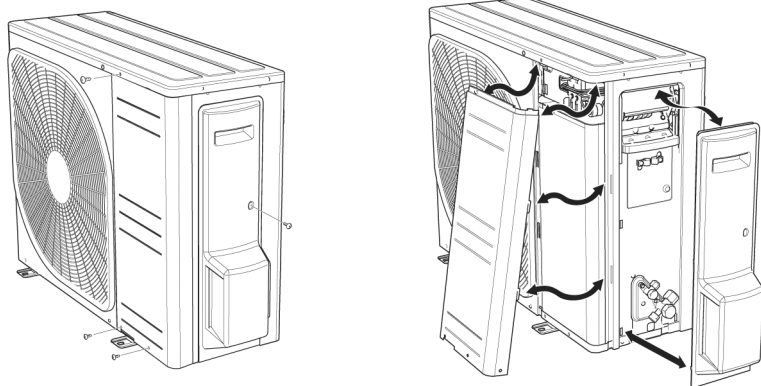


1	Free space behind
2	Minimum distance during use of several L...Split
3	However, the free space in front must be 100 cm for future servicing
4	Minimum distance during use of several L...Split

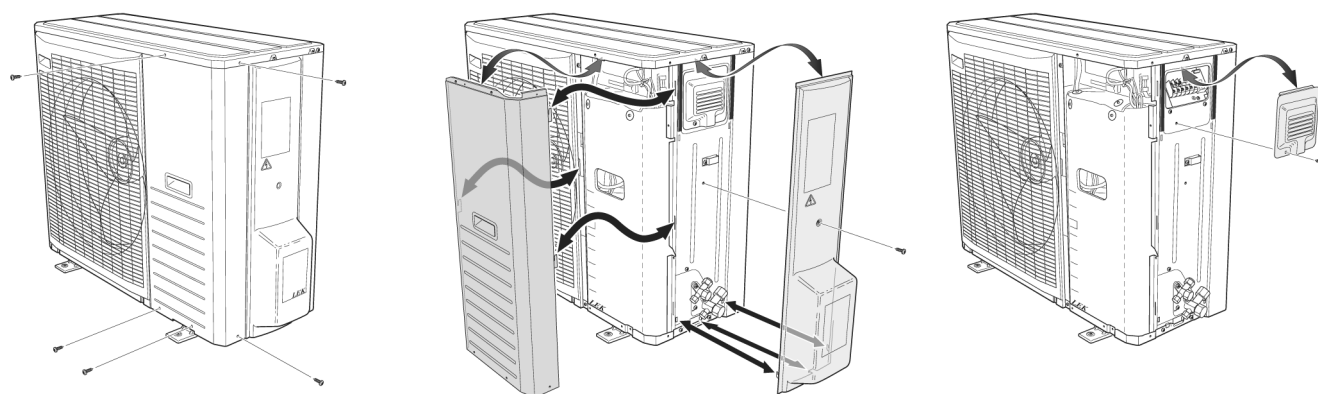


## 2.3 Removing the covers

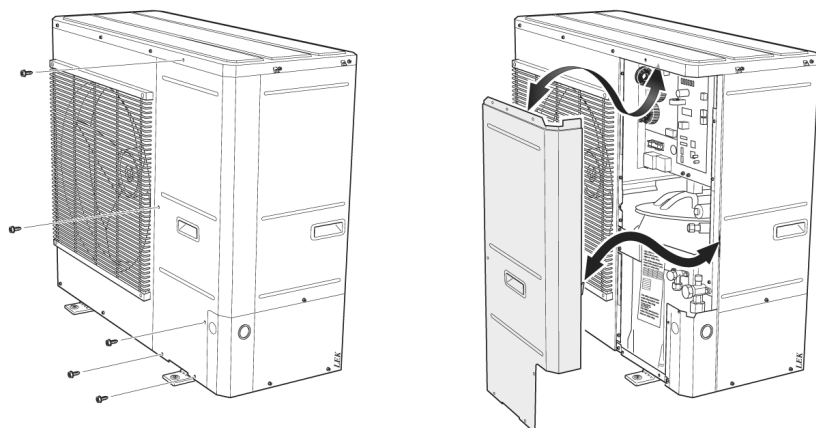
### L6 Split



### L8 Split



### L12 Split

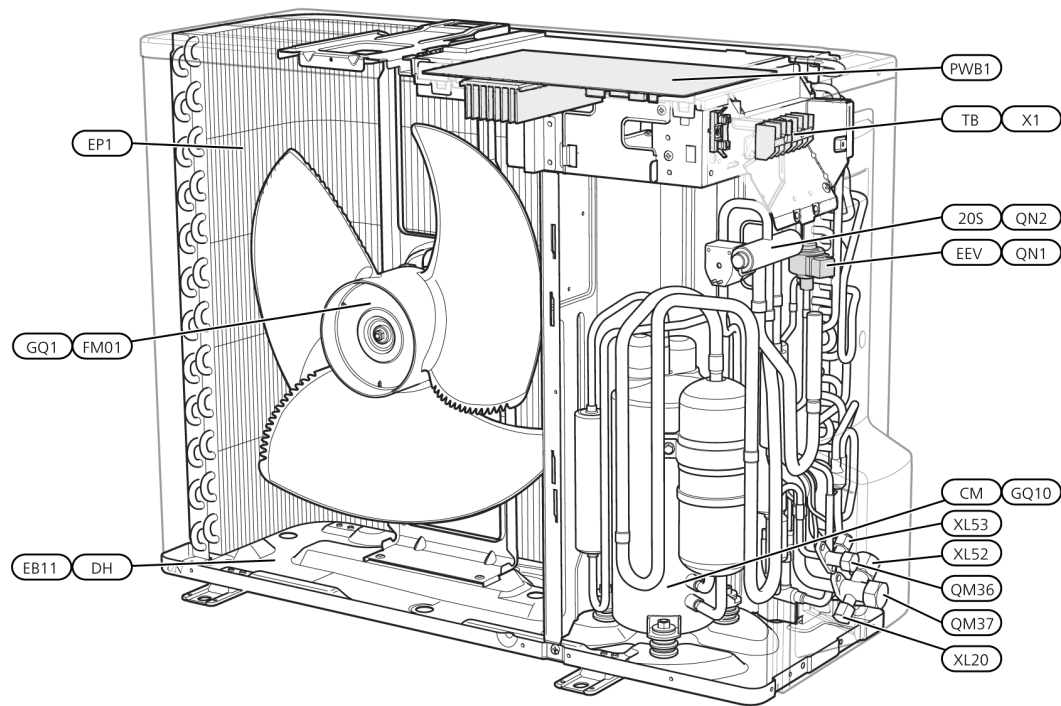




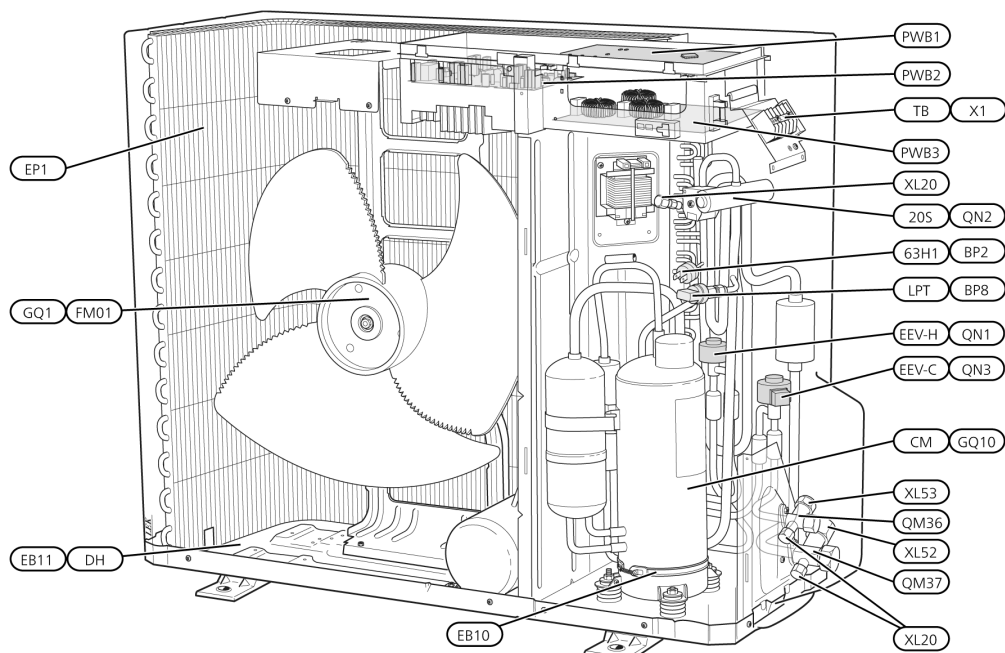


### 3 The heat pump design

#### Component locations L6 Split

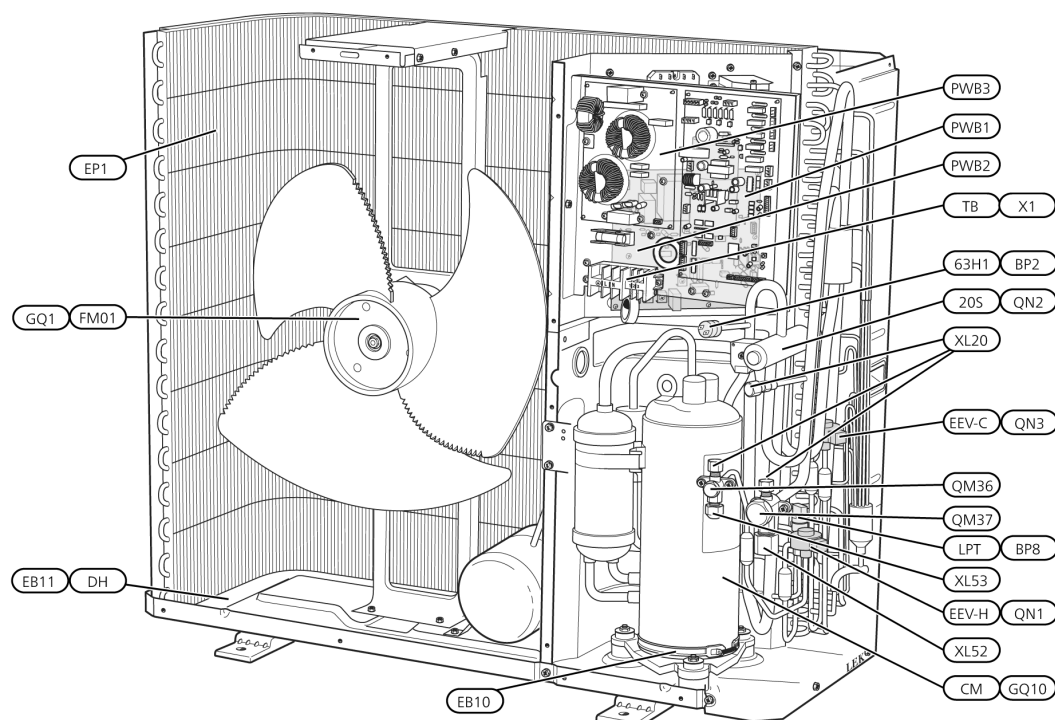


#### Component locations L8 Split





## Component locations L12 Split



### 3.1 List of components L...Split

#### Pipe connections

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

#### Electrical components

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

#### Cooling 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

#### Sensors etc.

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

#### Miscellaneous

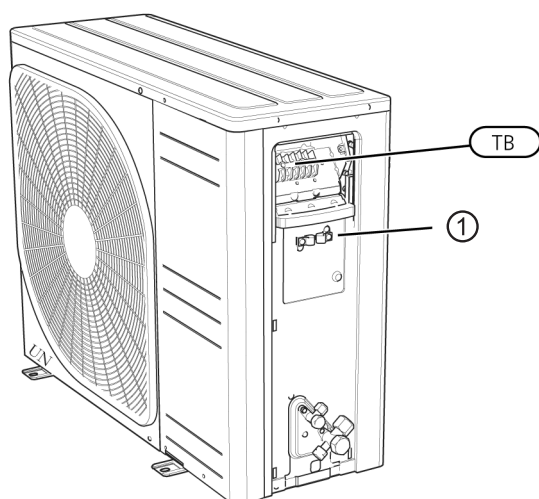
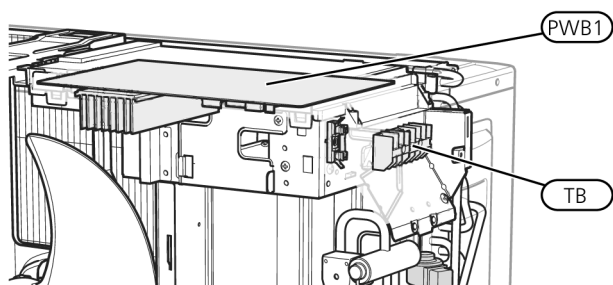
PF3	Serial number plate
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Designations at component positions according to standard EN 81346-2.  
Designations within brackets according to the supplier's standard.

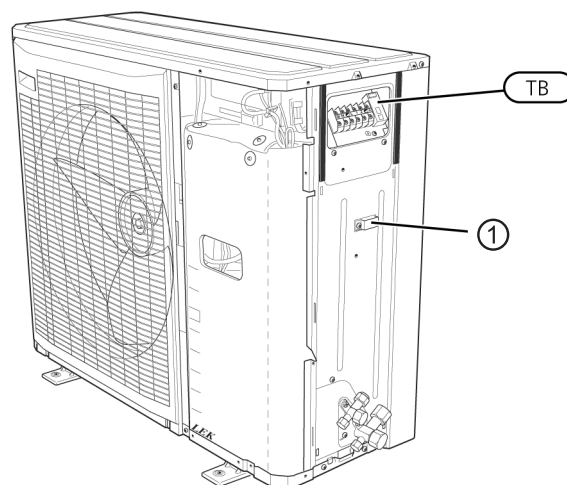
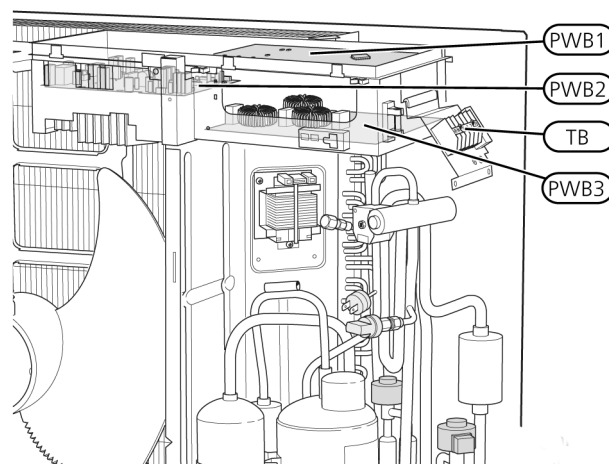


## 3.2 Electrical panel

### Component locations L...Split, L6 Split



### Component locations L8 Split



### Electrical components L...Split

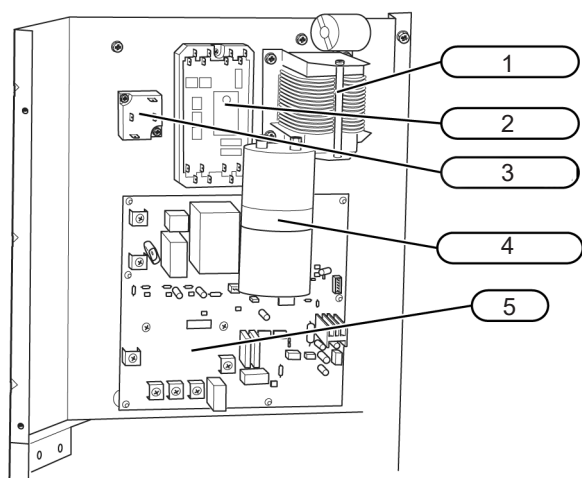
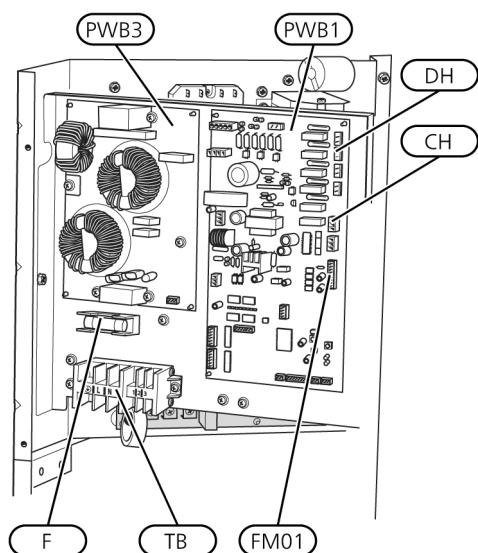
CH	Compressor heater
DH	Drain pan heater
F	Fuse
FM01	Fan motor
PWB1	Control board
PWB2	Inverter board
PWB3	Filter board
TB	Terminal block, incoming supply and communication
1	Cable holder

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

Designations within brackets according to the supplier's standard.



## Component locations L12 Split

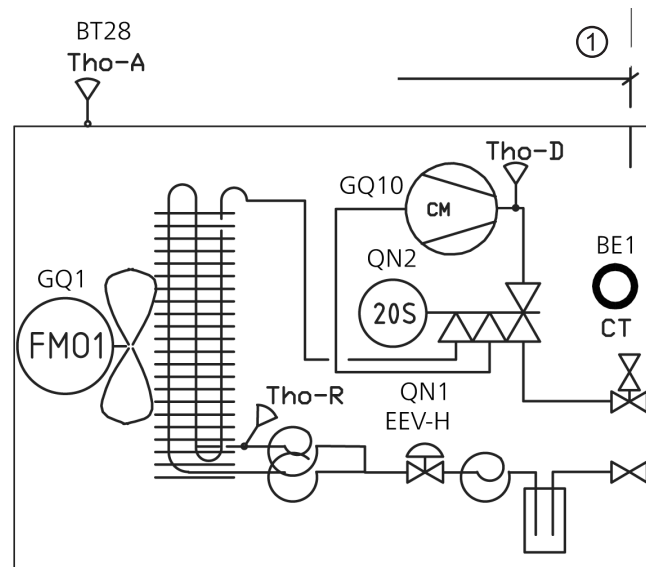


BE1(CT)	Current sensor
BT28(Tho-A)	Outdoor temperature
BP1(63H1)	High pressure pressostat
BP2(LPT)	Low pressure transmitter
GQ1(FM01)	Fan
GQ2(FM02)	Fan
GQ10(CM)	Compressor
1	Reactor
2	AF modul
3	Diode modul
4	Capacitor
5	PWB2

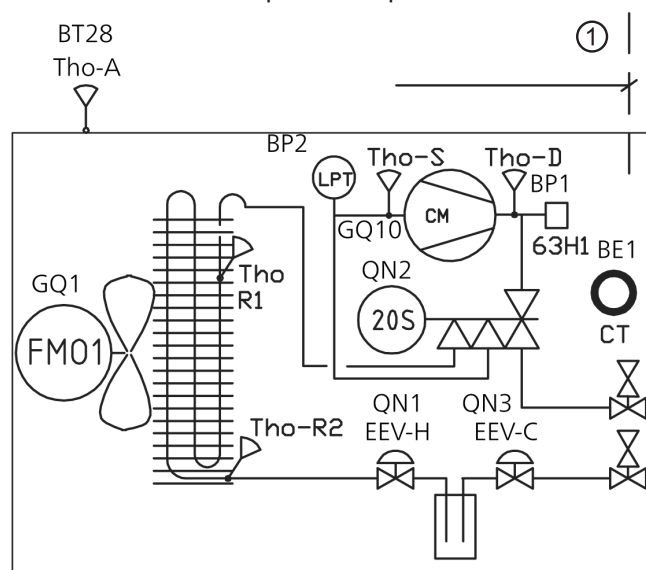
## 3.3 Sensor

### Positioning the temperature sensor

#### Outdoor module L6 Split



#### Outdoor module L8 Split / L12 Split

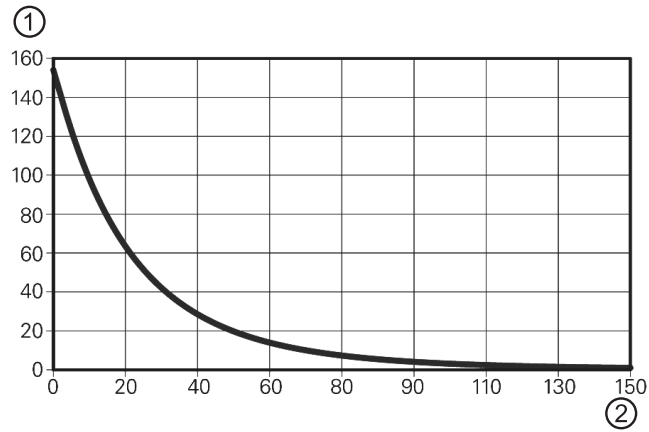


1	Incoming supply
QN1(EEV-H)	Expansion valve, heating
QN2(20S)	4-way valve
QN3(EEV-C)	Expansion valve, cooling
Tho-D	Hot gas sensor
Tho-R1	Evaporator sensor, out
Tho-R2	Evaporator sensor, in
Tho-S	Suction gas sensor

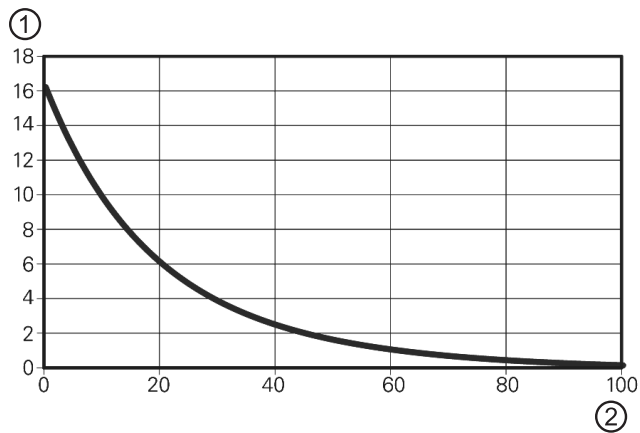


## Data for sensor in in L6 Split

Tho-D



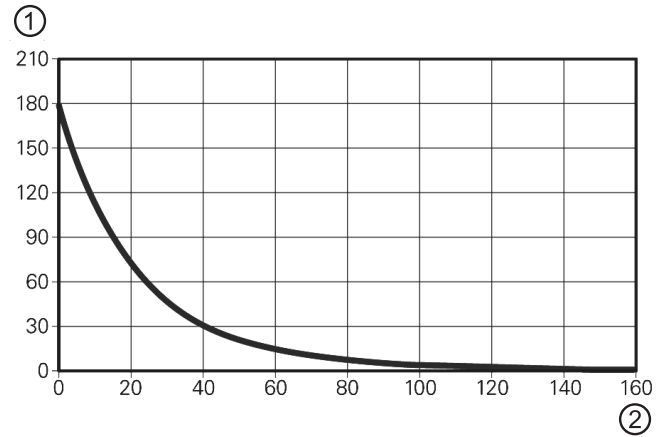
Tho-A, R



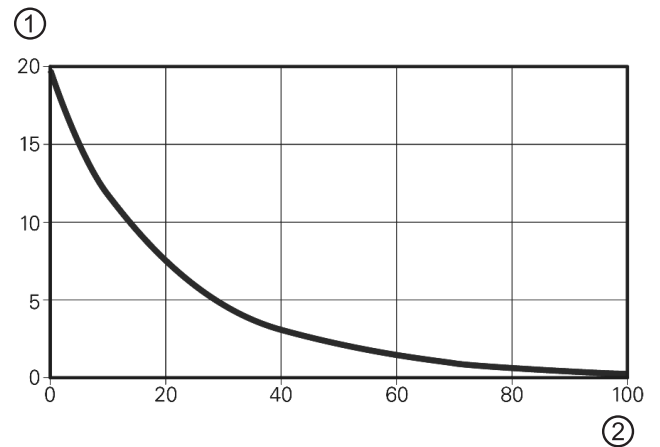
1	Resistance (k $\Omega$ )
2	Temperature (°C)

## Data for sensor in in L8 Split, L12 Split

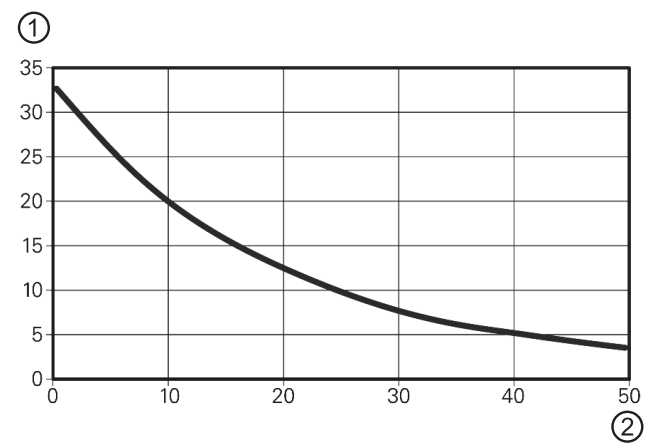
Tho-D



Tho-S, Tho-R1, Tho-R2



Tho-A (BT28)





## 4 Pipe connections

- For information: See chapter “Pipe connections” in the Installer Manual HSV Split.

## 5 Electrical connections

### 5.1 General

L...Split and HSV Split does not include an omnipolar circuit breaker on the incoming power supply. Therefore, its supply cables must 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 HSV Split and outdoor module L...Split before insulation testing the house wiring.
- For fuse ratings, see technical data, “Fuse protection”.
- If the building is equipped with an earth-fault breaker, L...Split 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.
- L...Split 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)
L 6 Split	15
L 8 Split	16
L 12 Split	23

- 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

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

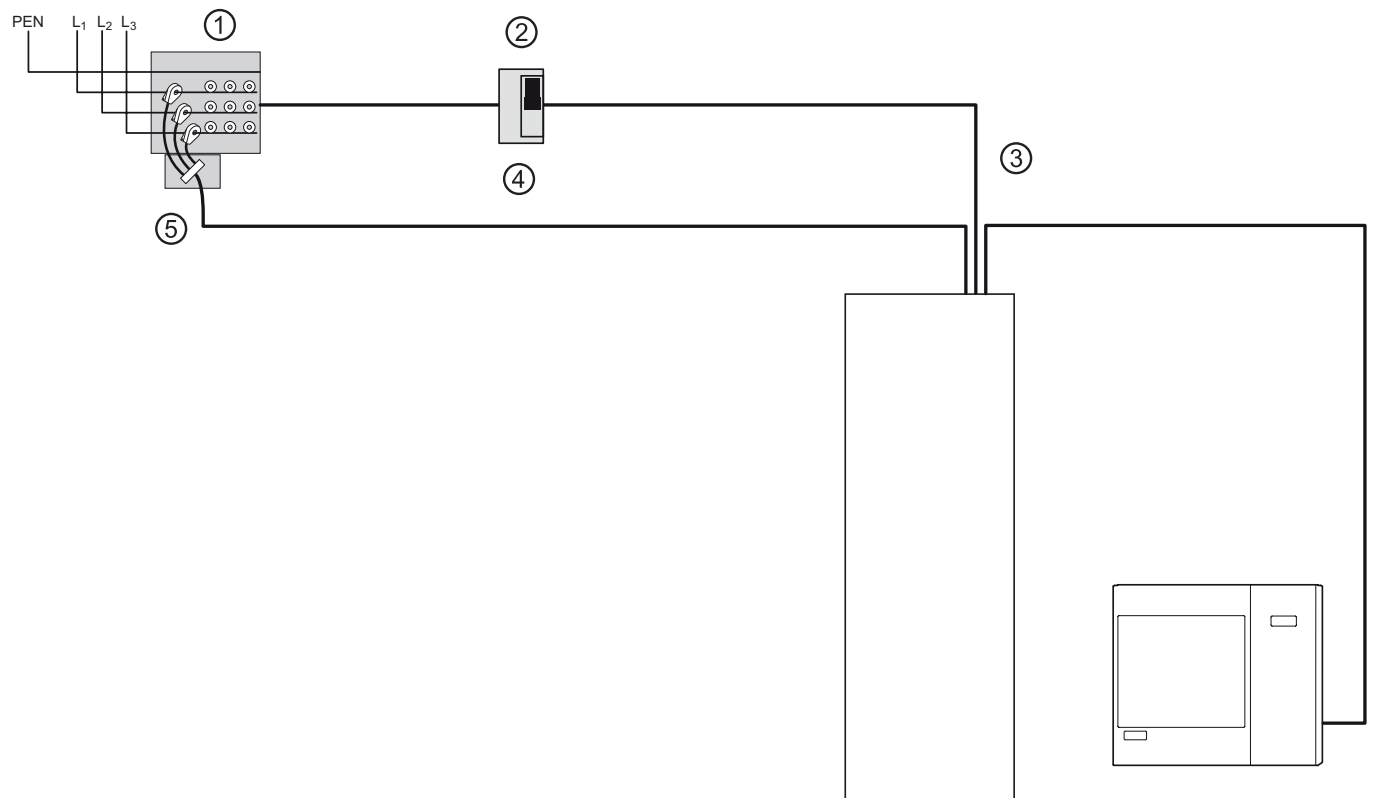


#### NOTE

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



## Principle diagram, electrical installation



\*Only in a 3-phase installation.

1	Switchbox
2	Switch
3	Current sensor*
4	Power cable and communication cable
5	Incoming supply

## 5.2 Electrical components

→ Chapter „The heat pump design“

## 5.3 Accessibility, electrical connection

### Removing the covers

→ Chapter „Removing the covers“





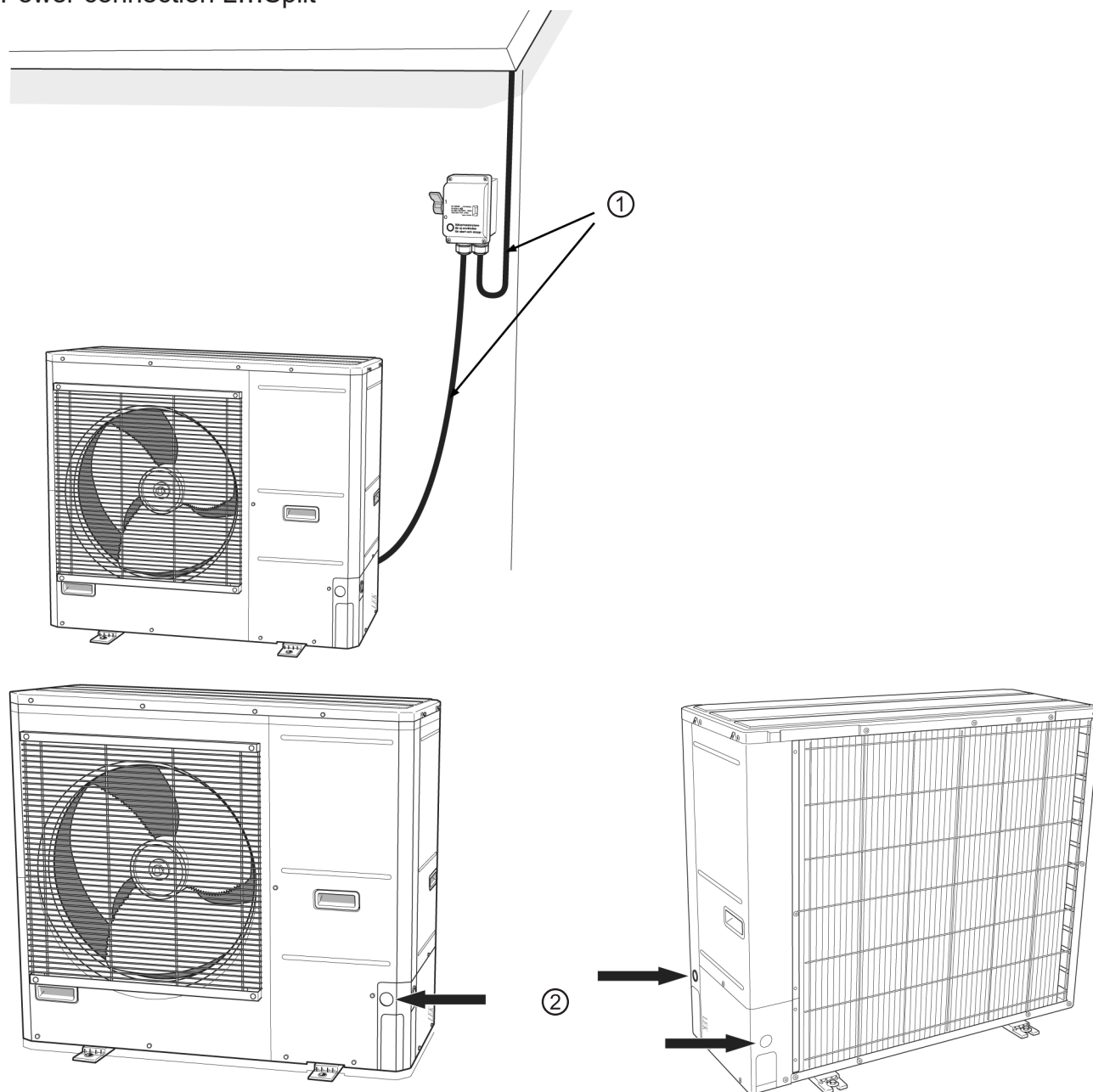
## 5.4 Connections



### NOTE

To prevent interference, unscreened communication and/or sensor cables to external connections must not be laid closer than 20 cm from high voltage cables.

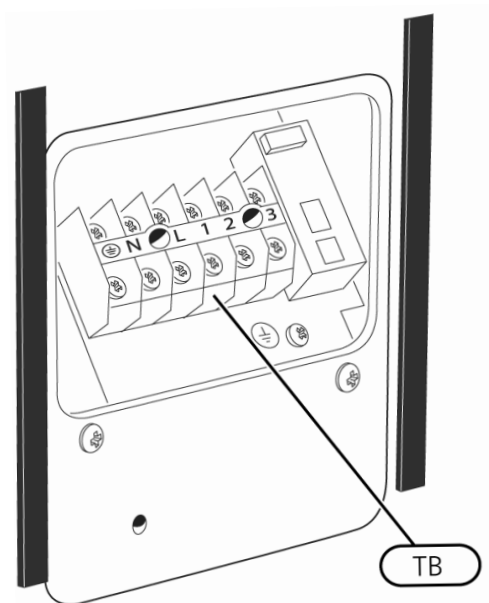
### Power connection L...Split



1	Incoming supply
2	Cable gland



## Communication connection



Communication is connected on terminal block TB.

→ Installer Manual for HSV Split.

## Connecting accessories

Instructions for connecting accessories are in the installation instructions provided for the respective accessory.

→ Chapter „Electrical connections“  
Installer Manual for HSV Split.

## 6 Commissioning and adjusting

### 6.1 Compressor heater

L...Split is equipped with a compressor heater (CH) that heats the compressor before start-up and when the compressor is cold. (Does not apply to L6 Split.)



#### NOTE

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

→ Chapter „Commissioning and adjustment“  
in the Installer Manual for the indoor module  
or control module.

## 7 Control - Heat pump

→ Chapter „Control – Heat pump“ in the Installer  
Manual for HSV Split



## 8 Disturbances in comfort

→ Chapter „Disturbances in comfort“ in the Installer Manual for HSV Split

### Troubleshooting



#### NOTE

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



#### TIP

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

### Basic actions

- Make sure that the air flow to L...Split is not blocked by foreign objects.
- Check that L...Split does not have any external damage.

### Ice build-up in the fan, grille and/or fan cone on L...Split

► Contact your installer!

### Water below L...Split (larger amount)

- Check that the water drainage via the condensation pipe (KWS) is working.
- Chapter „Disturbances in comfort“ in the Installer Manual for HSV Split

## 9 Accessories

Not all accessories are available on all markets.

### Refrigerant pipe kit

1/4"-1/2", 12 m, insulated,

for L6 Split

3/8"-5/8", 12 m, insulated,

for L8 Split and L12 Split

### Condensation water pipe

KWS 3/1Split

1 m

KWS 3/3Split

3 m

KWS 3/6Split

6 m

### Stand and brackets

Ground stand BKS Split

For L6 Split , L8 Split, L12 Split

### Wall bracket WKS Split

For L6 Split , L8 Split, L12 Split



## 10 Alarm list

Alarm	Alarm text on the display	Description	May be due to
162	High condenser out	Too high temperature out from the condenser. Self-resetting.	<ul style="list-style-type: none"><li>• Low flow during heating operation</li><li>• Too high set temperatures</li></ul>
163	High condenser in	Too high temperature into the condenser. Self-resetting.	<ul style="list-style-type: none"><li>• Temperature generated by another heat source</li></ul>
183	Defrosting in progress	Not an alarm, but an operating status.	<ul style="list-style-type: none"><li>• Set when the heat pump runs the defrosting procedure</li></ul>
220	HP alarm	The high pressure switch (63H1) deployed 5 times within 60 minutes or for 60 minutes continuously.	<ul style="list-style-type: none"><li>• Insufficient air circulation or blocked heat exchanger</li><li>• Open circuit or short circuit on input for high pressure switch (63H1)</li><li>• Defective high pressure switch</li><li>• Expansion valve not correctly connected</li><li>• Service valve closed</li><li>• Defective control board in L...Split</li><li>• Low or no flow during heating operation</li><li>• Defective circulation pump</li><li>• Defective fuse, F(4A)</li></ul>
221	LP alarm	Too low a value on the low pressure sensor (LPT) 3 times within 60 minutes.	<ul style="list-style-type: none"><li>• Open circuit or short circuit on input for low pressure sensor</li><li>• Defective low pressure sensor (LPT)</li><li>• Defective control board in L...Split</li><li>• Open circuit or short circuit on input for suction gas sensor (Tho-S)</li><li>• Defective suction gas sensor (Tho-S)</li></ul>
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).	<ul style="list-style-type: none"><li>• Any circuit breakers for L...Split off</li><li>• Incorrect cable routing</li></ul>
224	Fan alarm	Deviations in the fan speed in L...Split.	<ul style="list-style-type: none"><li>• The fan cannot rotate freely</li><li>• Defective control board in L...Split</li><li>• Defective fan motor</li><li>• Control board in L...Split dirty</li><li>• Fuse (F2) blown</li></ul>



Alarm	Alarm text on the display	Description	May be due to
230	Continuously high hot gas	Temperature deviation on the hot gas sensor (Tho-D) twice within 60 minutes or for 60 minutes continuously.	<ul style="list-style-type: none"><li>• Sensor does not work → Section „Communication connection“</li><li>• Insufficient air circulation or blocked heat exchanger</li><li>• If the fault persists during cooling, there may be an insufficient amount of refrigerant.</li><li>• Defective control board in L...Split</li></ul>
254	Communication error	Communication fault with accessory board	<ul style="list-style-type: none"><li>• L...Split not powered</li><li>• Fault in the communication cable.</li></ul>
261	High temperature in heat exchanger	Temperature deviation on the heat exchanger sensor (Tho-R1/R2) five times within 60 minutes or for 60 minutes continuously.	<ul style="list-style-type: none"><li>• Sensor does not work → Section „Disturbances in comfort“</li><li>• Insufficient air circulation or blocked heat exchanger</li><li>• Defective control board in L...Split</li><li>• Too much refrigerant</li></ul>
262	Power transistor too hot	When IPM (Intelligent power module) displays FO-signal (Fault Output) five times during a 60-minute period.	<ul style="list-style-type: none"><li>• Can occur when 15V power supply to the inverter PCB is unstable.</li></ul>
263	Inverter error	Voltage from the inverter outside the parameters four times within 30 minutes.	<ul style="list-style-type: none"><li>• Incoming power supply interference</li><li>• Service valve closed</li><li>• Insufficient amount of refrigerant</li><li>• Compressor fault</li><li>• Defective circuit board for inverter in L...Split</li></ul>
264	Inverter error	Communication between circuit board for inverter and control board broken.	<ul style="list-style-type: none"><li>• Open circuit in connection between boards</li><li>• Defective circuit board for inverter in L...Split</li><li>• Defective control board in L...Split</li></ul>
265	Inverter error	Continuous deviation on power transistor for 15 minutes.	<ul style="list-style-type: none"><li>• Defective fan motor</li><li>• Defective circuit board for inverter in L...Split</li></ul>
266	Insufficient refrigerant	Insufficient refrigerant is detected upon start-up in cooling mode.	<ul style="list-style-type: none"><li>• Service valve closed</li><li>• Loose connection sensor (BT15, BT3)</li><li>• Defective sensor (BT15, BT3)</li><li>• Too little refrigerant</li></ul>
267	Inverter error	Failed start for compressor	<ul style="list-style-type: none"><li>• Defective circuit board for inverter in L...Split</li><li>• Defective control board in L...Split</li><li>• Compressor fault</li></ul>



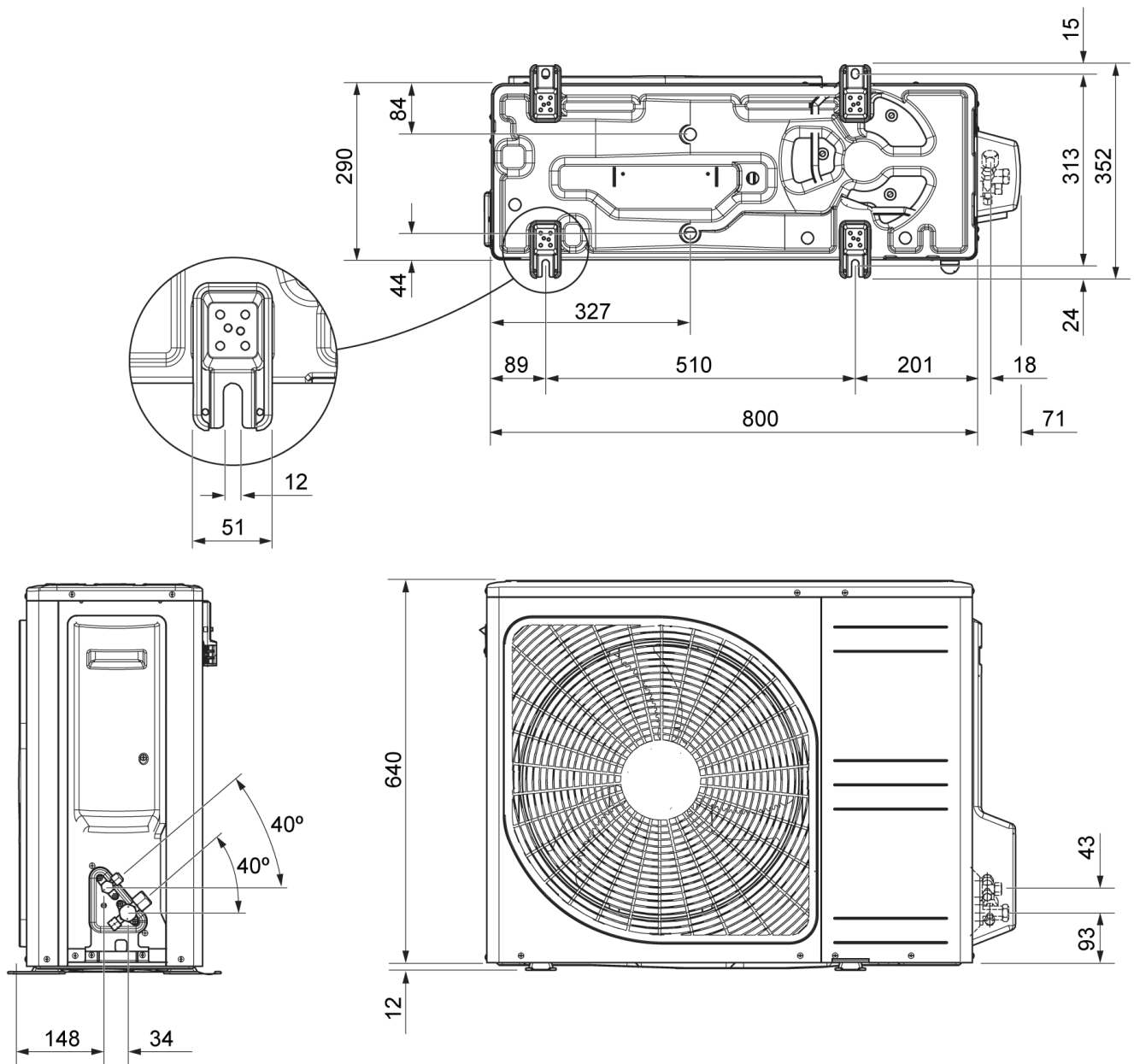
Alarm	Alarm text on the display	Description	May be due to
268	Inverter error	Overcurrent, Inverter A/F module	<ul style="list-style-type: none"> <li>• Sudden power failure</li> </ul>
271	Cold outdoor air	Temperature of BT28 (Tho-A) below the set value that permits operation	<ul style="list-style-type: none"> <li>• Cold weather conditions</li> <li>• Sensor fault</li> </ul>
272	Hot outdoor air	Temperature of BT28 (Tho-A) above the value that permits operation	<ul style="list-style-type: none"> <li>• Warm weather conditions</li> <li>• Sensor fault</li> </ul>
277	Sensor fault Tho-R	Sensor fault, heat exchanger in L...Split (Tho-R).	<ul style="list-style-type: none"> <li>• Open circuit or short circuit on sensor input</li> <li>• Sensor does not work → Section „Disturbances in comfort“</li> <li>• Defective control board in L...Split</li> </ul>
278	Sensor fault Tho-A	Sensor fault, outdoor temperature sensor in L...Split BT28 (Tho-A).	<ul style="list-style-type: none"> <li>• Open circuit or short circuit on sensor input</li> <li>• Sensor does not work → Section „Disturbances in comfort“</li> <li>• Defective control board in L...Split</li> </ul>
279	Sensor fault Tho-D	Sensor fault, hot gas in L...Split (Tho-D).	<ul style="list-style-type: none"> <li>• Open circuit or short circuit on sensor input</li> <li>• Sensor does not work → Section „Disturbances in comfort“</li> <li>• Defective control board in L...Split</li> </ul>
280	Sensor fault Tho-S	Sensor fault, suction gas in L...Split (Tho-S).	<ul style="list-style-type: none"> <li>• Open circuit or short circuit on sensor input</li> <li>• Sensor does not work → Section „Disturbances in comfort“</li> <li>• Defective control board in L...Split</li> </ul>
281	Sensor fault LPT	Sensor fault, low pressure transmitter in L...Split.	<ul style="list-style-type: none"> <li>• Open circuit or short circuit on sensor input</li> <li>• Sensor does not work → Section „Disturbances in comfort“</li> <li>• Fault in the refrigerant circuit</li> </ul>
294	Non-compatible outdoor air heat pump	Heat pump and indoor module (VVM) /control module (SMO) do not work properly together due to technical parameters.	<ul style="list-style-type: none"> <li>• Outdoor module and indoor module (VVM) / control module (SMO) are not compatible.</li> </ul>



## 11 Technical data

### 11.1 Dimensions

#### Dimensions L6 Split

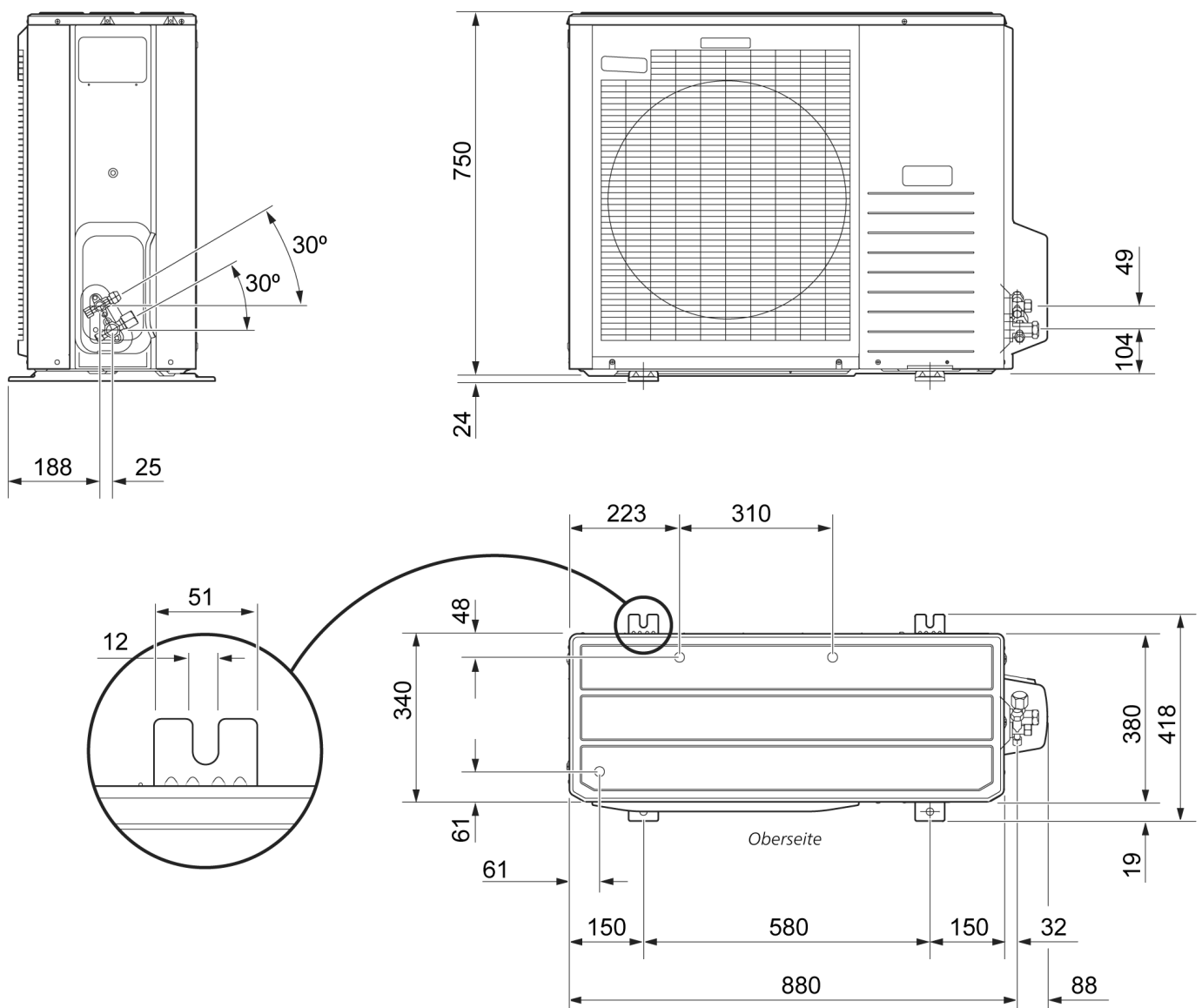


All dimensions in mm.





## Dimensions L8 Split



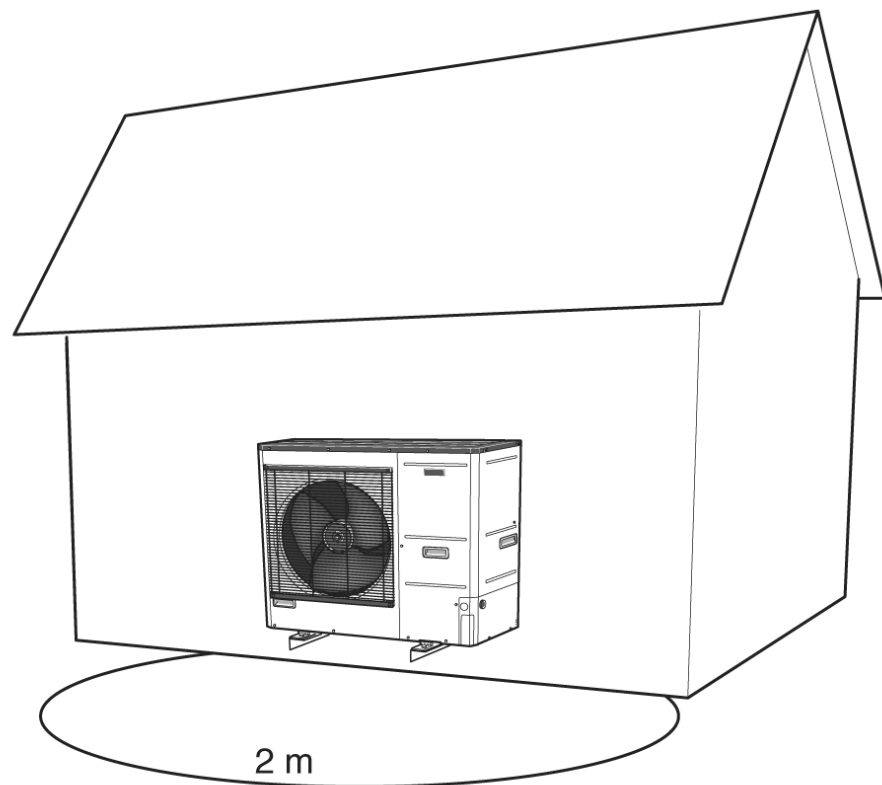
All dimensions in mm.





## 11.2 Sound pressure levels

L...Split is usually placed next to a house wall, which gives a directed sound distribution that should be considered. Accordingly, you should always attempt to find a placement on the side that faces the least sound sensitive neighbouring area. The sound pressure levels are further affected by walls, bricks, differences in ground level, etc and should therefore only be seen as guide values.



Noise		L6 Split	L8 Split	L12 Split
Sound power level, according to EN12102 at 7/35 °C (nominal)*	LW(A)	51	55	58
Sound pressure level at 2 m free standing (nominal)*	dB(A)	37	41	44

\* Free space.



## 11.3 Technical specifications

### L...Split

Outdoor module		L6 Split	L8 Split	L12 Split
Output data according to EN 14511 ΔT5K	Outdoor temp./ Supply temp.			
Heating Capacity / power input / COP (kW/kW/-) at nominal flow	7/35 °C (floor)	2,67/0,5/4,85	3,86/0,83/4,65	5,21/1,09/4,78
	2/35 °C (floor)	2,32/0,55/4,2	5,11/1,36/3,76	6,91/1,79/3,86
	-7/35 °C (floor)	4,60/1,79/2,57	6,60/2,46/2,68	9,00/3,27/2,75
	7/45 °C	2,28/0,63/3,62	3,70/1,00/3,70	5,00/1,31/3,82
	2/45 °C	1,93/0,67/2,88	5,03/1,70/2,96	6,80/2,24/3,04
Cooling Capacity / Power input / EER (kW/kW/-) at maximum flow	27/7 °C	5,87/1,65/3,56	7,52/2,37/3,17	9,87/3,16/3,13
	27/18 °C	7,98/1,77/4,52	11,20/3,20/3,50	11,70/3,32/3,52
	35/7 °C	4,86/1,86/2,61	7,10/2,65/2,68	9,45/3,41/2,77
	35/18 °C	7,03/2,03/3,45	9,19/2,98/3,08	11,20/3,58/3,12
Electrical data				
Rated voltage	230V 50 Hz, 230V 2WS 50 Hz			
Max. current	A <sub>rms</sub>	15	16	23
Recommended fuse rating	A <sub>rms</sub>	16	16	25
Starting current	A <sub>rms</sub>	5		
Max fan flow (heating, nominal)	m³/h	2 530	3 000	4 380
Fan rating	W	50	86	
Drain pan heater (integrated)	W	110	100	120
Defrosting	Reverse cycle			
Enclosure class	IP24			
Refrigerant circuit				
Type of refrigerant	R410A			
GWP refrigerant	2 088			
Compressor	Twin Rotary			
Refrigerant quantity	kg	1,5	2,55	2,90
CO <sub>2</sub> -equivalent	t	3,13	5,32	6,06
Cut-out value, pressure switch, high pressure	MPa (Bar)	-	4,15 (41,5)	
Breaking value high pressure	MPa (Bar)	4,15 (41,5)		
Cut-out value, pressure switch, lowpressure (15 s)	MPa (Bar)	-	0,079 MPa (0,79)	
Max. length, refrigerant pipe, one way	m	30*		
Max height difference, refrigerant pipe	m	7		
Dimensions, refrigerant pipe	Gas pipe: OD12,7 (1/2") Fluid pipe: OD6,35 (1/4")		Gas pipe: OD15,88 (5/8") Fluid pipe: OD9,52 (3/8")	
Pipe connections				
Pipe connection option	Right-hand side	Right-hand side	Right /bottom /reverse	
Pipe connections	Flare			

\* L6 Split: If the length of the refrigerant pipes exceeds 15 m, extra refrigerant must be added at a rate of 0.02 kg/m.

L8 Split, L12 Split: If the length of the refrigerant pipes exceeds 15 metres, extra refrigerant must be added at a rate of 0.06 kg/m.

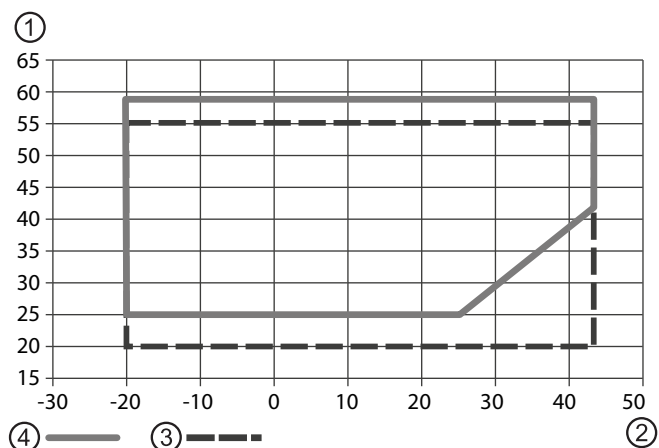


Dimensions and weight		L6 Split	L8 Split	L12 Split
Width	mm	800	880 (+67 valve protection)	970
Depth	mm	290	340 (+110 with footrail)	370 (+80 with footrail)
Height	mm	640	750	845
Weight	kg	46	60	74
Miscellaneous				
Part no.		064 205	064 033	064 110



## 11.4 Working area

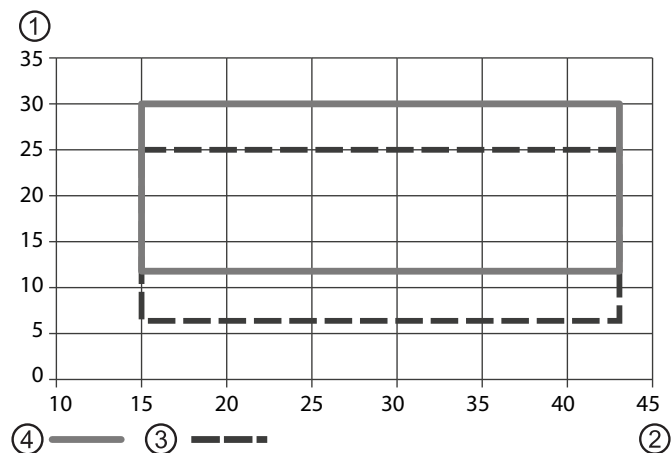
### Compressor operation – heating



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

1	Temperature (°C)
2	Outdoor temperature (°C)
3	Return pipe
4	Flow pipe

### Compressor operation – cooling

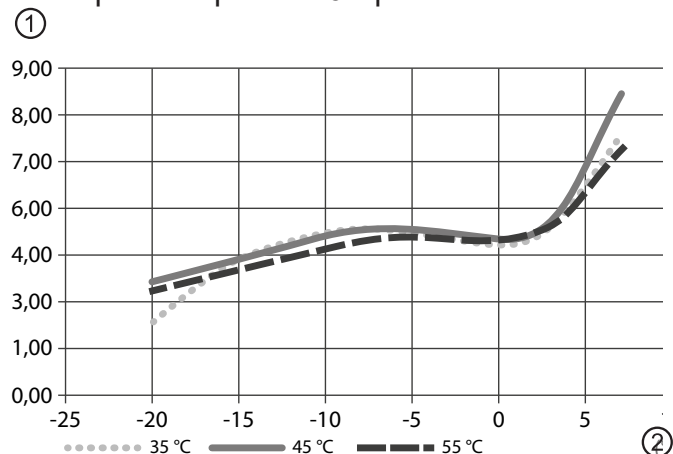


1	Temperature (°C)
2	Outdoor temperature (°C)
3	Return pipe
4	Flow pipe

## 11.5 Capacity and COP

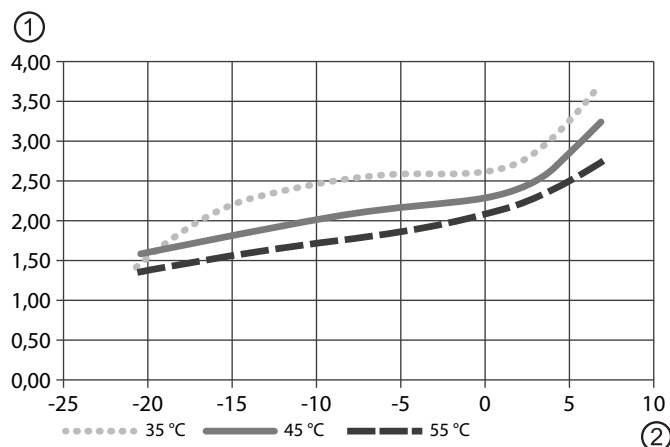
Capacity and COP at different supply temperatures. Maximum capacity including defrosting.

### Max. specified power L6 Split



1	Heating output (kW)
2	Outdoor temperature (°C)

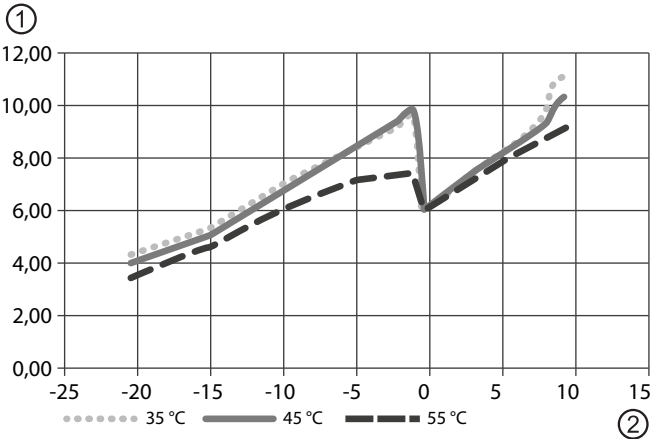
### COP L6 Split



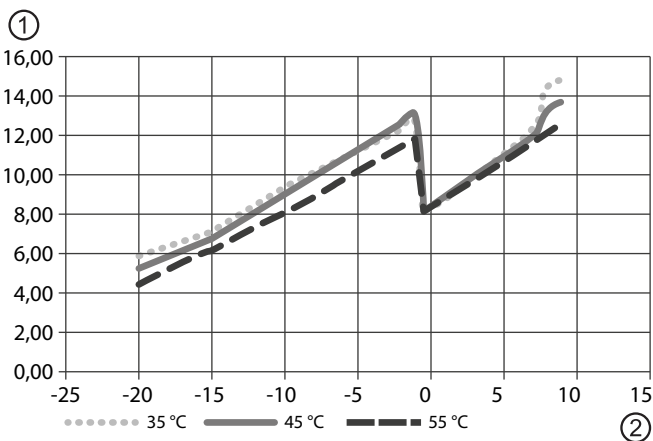
1	COP
2	Outdoor temperature (°C)



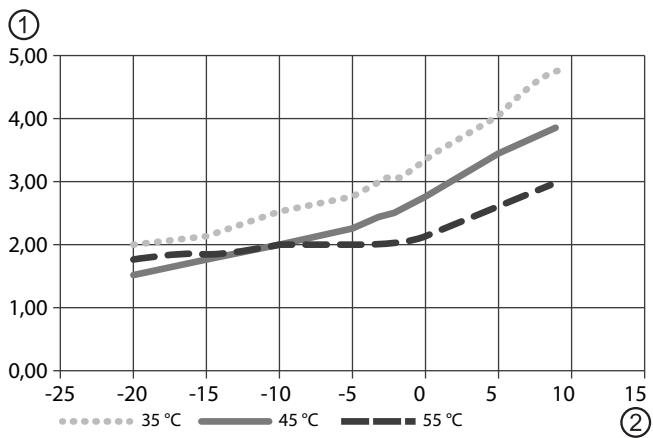
### Max. specified power L8 Split



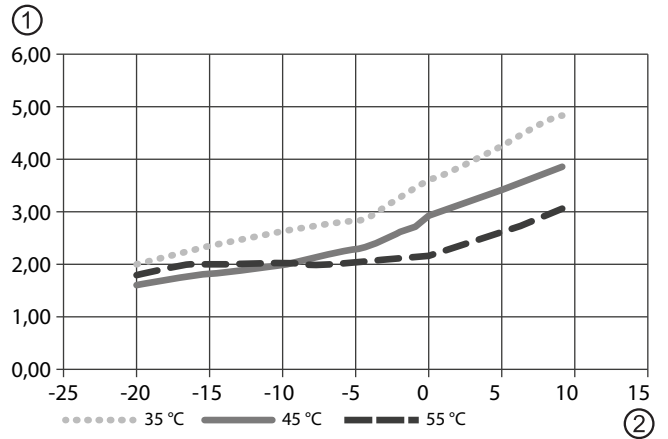
### Max. specified power L12 Split



### COP L8 Split

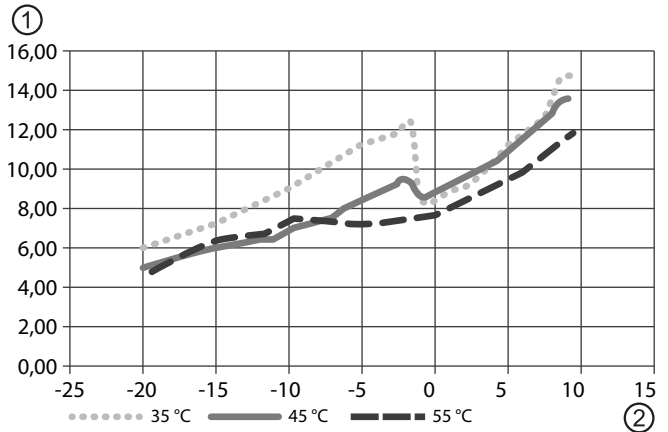


### COP L12 Split

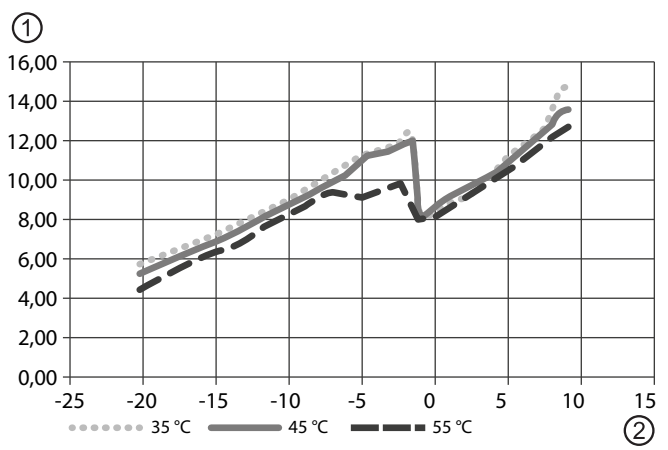


## 11.6 Output with lower fuse rating than recommended

### Capacity L12Split, fuse rating 16A



### Capacity L12Split, fuse rating 20A



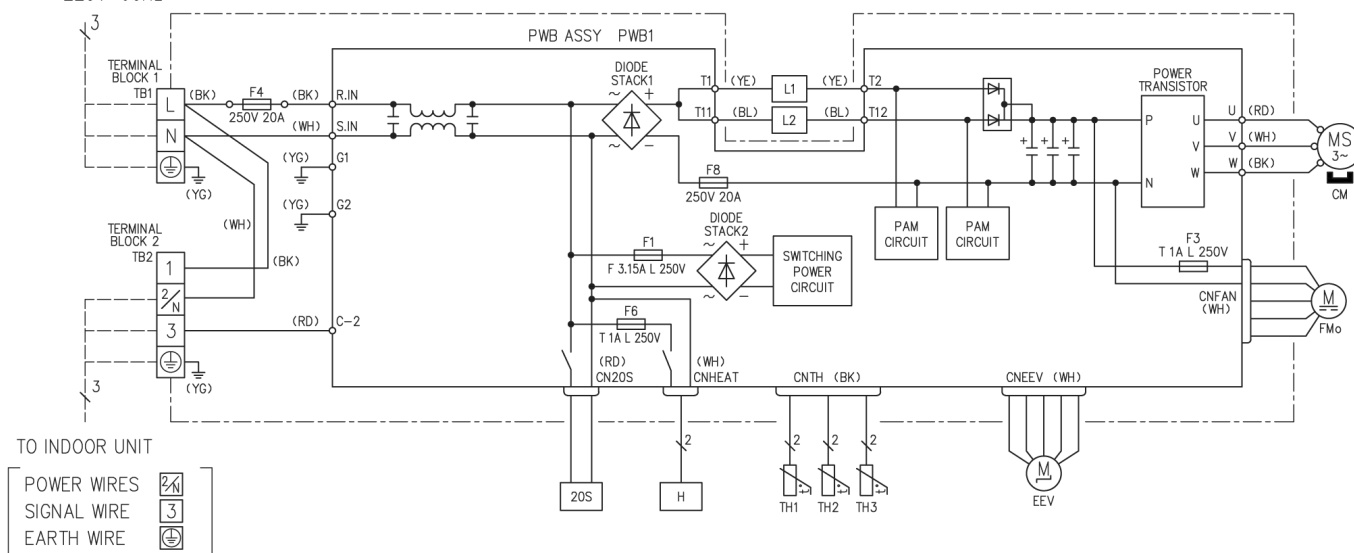




## 11.7 Electrical circuit diagram

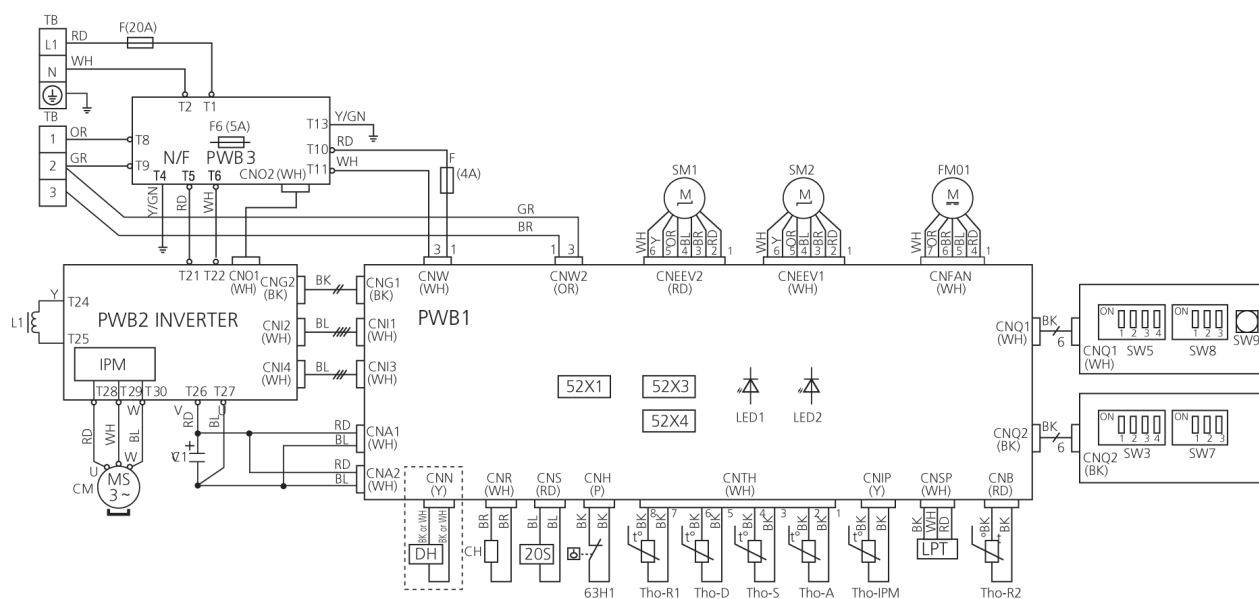
### Circuit diagram L6 Split

POWER SOURCE  
1 PHASE  
220-240V 50Hz  
220V 60Hz



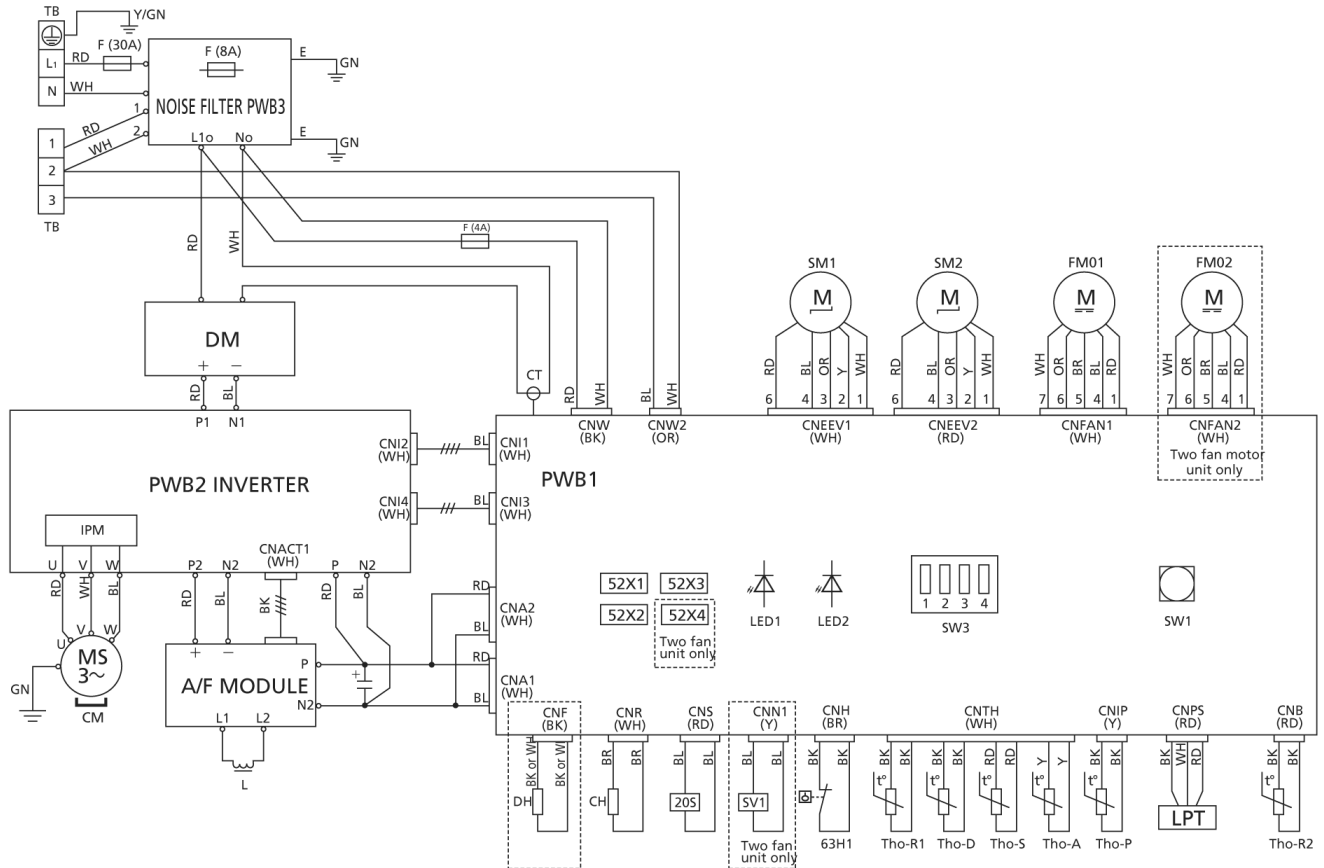
### Circuit diagram L8 Split

230 V ~ 50 Hz



### Circuit diagram L12 Split

230 V ~ 50 Hz



Designation	Description
20S	Solenoid for 4-way valve
52X1	Auxiliary relay (for CH)
52X2	Auxiliary relay (for DH)
52X3	Auxiliary relay (for 20S)
52X4	Auxiliary relay (for SV1)
63H1	High pressure pressostat
C1	Capacitor
CH	Compressor heater
CM	Compressor motor
CnA~Z	Terminal block
CT	Current sensor
DH	Drain pan heater
DM	Diode module
F	Fuse
FM01, FM02	Fan motor
IPM	Intelligent power module

Designation	Description
L/L1	Induction coil
LED1	Indication lamp (red)
LED2	Indication lamp (green)
LPT	Low pressure transmitter
QN1 (EEV-H)	Expansion valve for heating
QN3 (EEV-C)	Expansion valve for cooling
SW1, 9	Pumpdown
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





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