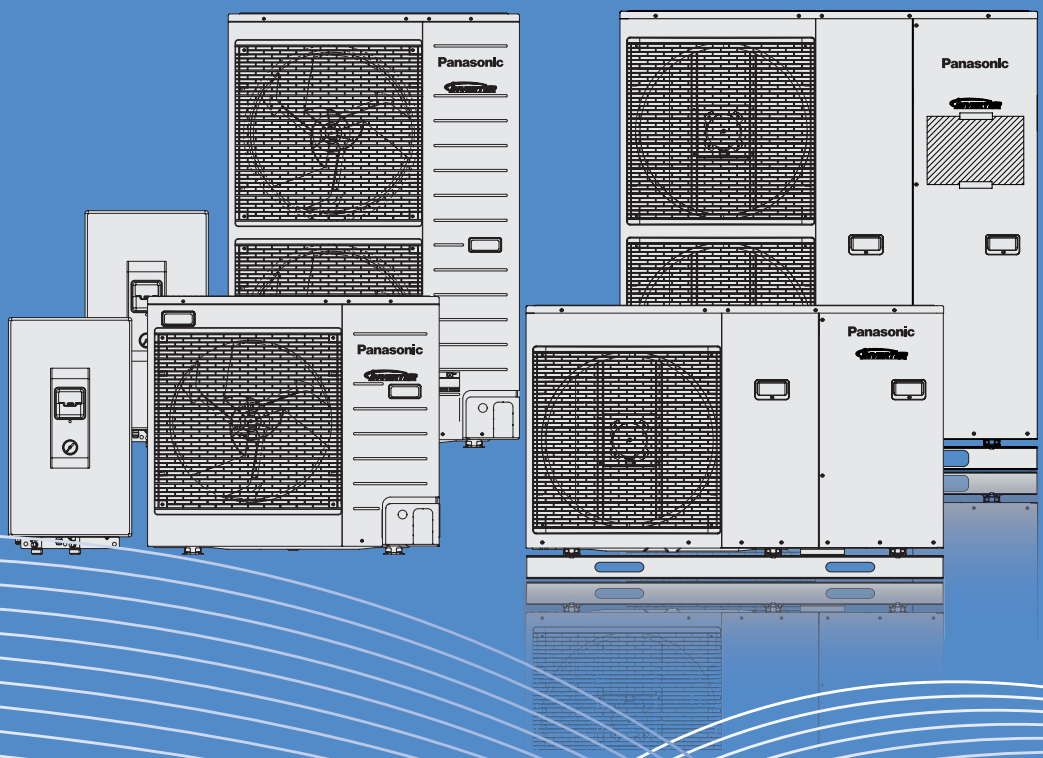
Order Nr. A2W-SPX-130305-021

Panasonic

heatingandcoolingsystems

Aquarea Air / Water Heat Pump – Heating and Cooling Systems 2014



INSTALLATION MANUAL

for Monobloc and Split Systems C, D and E Series

Service

For any questions on

Commissioning

Malfunctions

Technical support

our hotline is available
around the clock at

01344 853393

- Nationwide service organisation
- 24/7 emergency service
- Commissioning
- Maintenance
- Professional service processing
- If required, cooling system installation support
- Central spare part supply
- Central call centre number for:
  - Commissioning
  - Malfunctions
  - Technical support

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1 Introduction

1.1 About this manual

This manual provides you with information on simple and correct mounting, as well as hydraulic and electric installation.

Ensure that you have read and understood the installation and safety instructions in this manual before you start work. Incorrect installation due to a failure to follow instructions in this manual, or insufficient compliance with the instructions, can result in damage.

If you are unsure about the installation, please contact our service team for clarification: **01344 853393.**

1.2 Target audience

This manual is intended for qualified installation engineers and electricians. It is not intended for unqualified persons.

Electrical and plumbing installation work must be performed by a qualified electrician or plumber.

1.3 Products covered

This manual covers the following Aquarea heat pump systems:

1.3.1 Monobloc Systems

Aquarea LT	WH-MDF06E3E5*, WH-MDF09E3E5*, WH-MDF09C3E5, WH-MDC09C3E5, WH-MDF09C3E8, WH-MDC09C3E8, WH-MDF12C6E5, WH-MDC12C6E5, WH-MDF12C9E8, WH-MDC12C9E8, WH-MDF14C6E5, WH-MDC14C6E5, WH-MDF14C9E8, WH-MDC14C9E8, WH-MDF16C6E5, WH-MDC16C6E5, WH-MDF16C9E8, WH-MDC16C9E8
Aquarea T-CAP	WH-MXF09D3E5, WH-MXC09D3E5, WH-MXF09D3E8, WH-MXC09D3E8, WH-MXF12D6E5, WH-MXC12D6E5, WH-MXF12D9E8, WH-MXC12D9E8
Aquarea HT	WH-MHF09D3E5, WH-MHF09D3E8, WH-MHF12D6E5, WH-MHF12D9E8

* Devices have a high efficiency pump and fulfill the criteria of the Ecodesign Directive valid from 2015 for energy related products (ErP)

1.3.2 Split Systems

Series	Hydro module	Outdoor unit
Aquarea LT	WH-SDF03E3E5*	WH-UD03EE5
	WH-SDF05E3E5*	WH-UD05EE5
	WH-SDC03E3E5*	WH-UD03EE5
	WH-SDC05E3E5*	WH-UD05EE5
	WH-SDF07C3E5	WH-UD07CE5
	WH-SDC07C3E5	WH-UD07CE5
	WH-SDF09C3E5	WH-UD09CE5
	WH-SDC09C3E5	WH-UD09CE5
	WH-SDF09C3E8	WH-UD09CE8
	WH-SDC09C3E8	WH-UD09CE8
	WH-SDF12C6E5	WH-UD12CE5
	WH-SDC12C6E5	WH-UD12CE5
	WH-SDF12C9E8	WH-UD12CE8
	WH-SDC12C9E8	WH-UD12CE8
	WH-SDF14C6E5	WH-UD14CE5
	WH-SDC14C6E5	WH-UD14CE5
	WH-SDF14C9E8	WH-UD14CE8
	WH-SDC14C9E8	WH-UD14CE8
	WH-SDF16C6E5	WH-UD16CE5
	WH-SDC16C6E5	WH-UD16CE5
	WH-SDF16C9E8	WH-UD16CE8
	WH-SDC16C9E8	WH-UD16CE8

Series	Hydro module	Outdoor unit
Aquarea T-CAP	WH-SXF09D3E5	WH-UX09DE5
	WH-SXC09D3E5	WH-UX09DE5
	WH-SXF09D3E8	WH-UX09DE8
	WH-SXC09D3E8	WH-UX09DE8
	WH-SXF12D6E5	WH-UX12DE5
	WH-SXF12D9E8	WH-UX12DE5
	WH-SXF12D9E8	WH-UX12DE8
	WH-SXC12D9E8	WH-UX12DE8
Aquarea HT	WH-SHF09D3E5	WH-UH09DE5
	WH-SHF09D3E8	WH-UH09DE8
	WH-SHF12D6E5	WH-UH12DE5
	WH-SHF12D9E8	WH-UH12DE8

*Devices have a high efficiency pump and fulfil the criteria of the Ecodesign Directive valid from 2015 for energy-related products (ErP)

1.4 Symbols used

The warnings in this manual absolutely must be heeded, as they are safety-critical. The symbols have the following meanings:

Danger! Danger of fatal injury from electric shock if not observed

Danger! Danger of fatal injury or damage to health if not observed

Warning! Material damage if not observed

NOTE Further information

➤ Identification of a step

1.5 Tools required

1.5.1 Monobloc systems

We recommend that you use the following tools:

- Phillips-head screwdriver
- Spirit level
- Electric drill
- Set of spanners
- Knife
- Tape measure
- Multimeter
- Torque wrench, 39.2 Nm
- Torque wrench, 58.8 Nm
- Gas leak detector

1.5.2 Split systems

We recommend that you use the following tools:

- Philiips head screwdriver
- Spirit level
- Electric drill, drill bit (ø 70 mm)
- Allen key (4 mm)
- Set of spanners
- Pipe cutter
- Deburrer
- Knife
- Gas leak detector
- Tape measure
- Thermometer
- Multimeter
- Torque wrench, 18 Nm
- Torque wrench, 55 Nm
- Torque wrench, 65 Nm
- Vacuum pump
- Manometer station

1.6 To be provided by customer

1.6.1 Monobloc systems

The following components must be provided by the customer:

- 2-way directional valve set
- 3-way directional valve set
- Analogue room thermostat (e.g. RAA20 Siemens) or programmable room thermostat (e.g. REV200 Siemens)
- Anchoring to prevent tipping over
- Dirt trap (mesh width at least 500 to 600 µm)
- Propylene glycol antifreeze mixture
- Flush-mounted box for fitting the wired remote control
- Heating circuit mixer closed-loop control
- Dew point monitor
- Device for draining the system
- Insulation for pipelines

1.6.2 Split systems

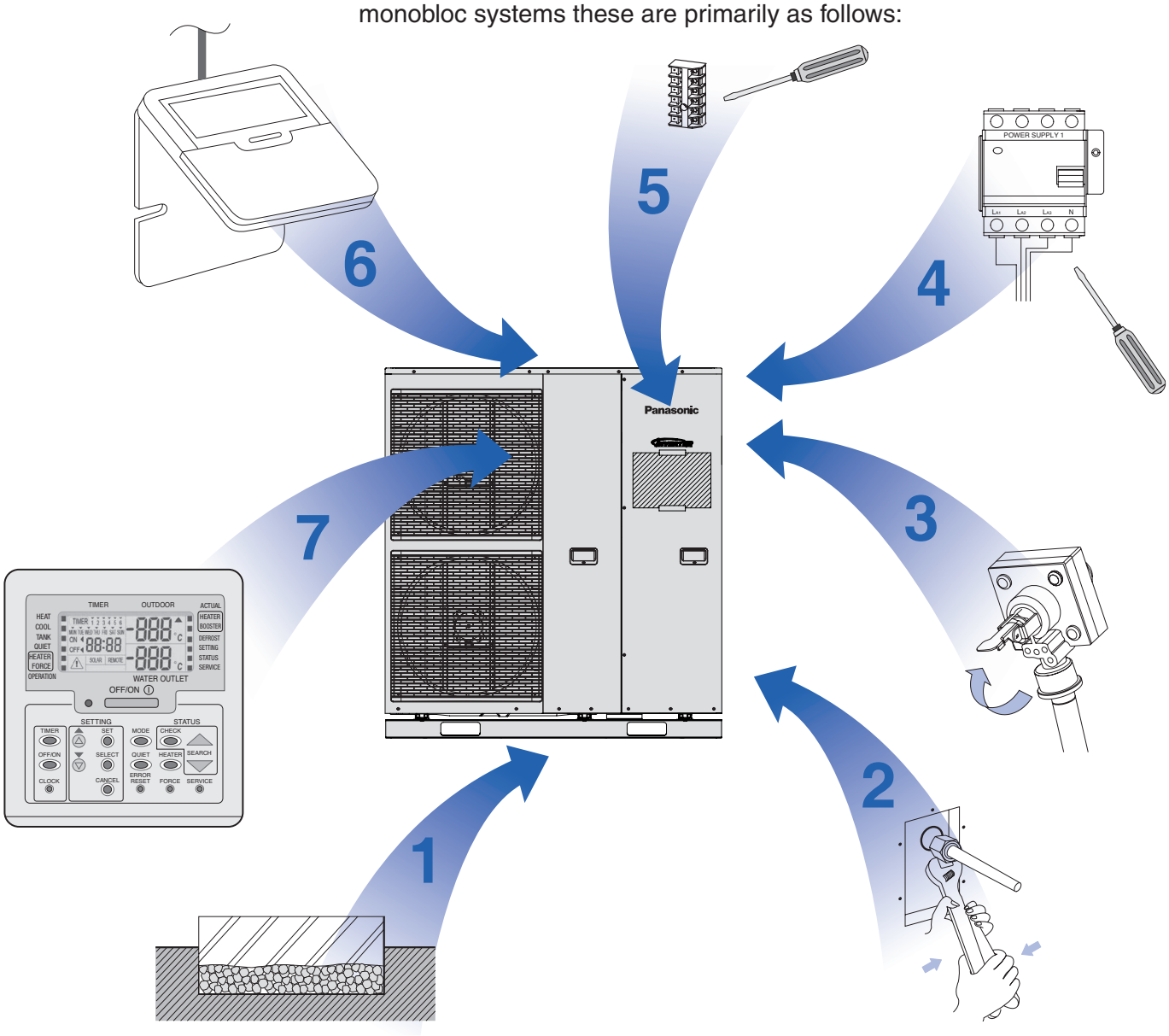
The following components must be provided by the customer:

- Wall penetration or bushing DN 70
- Sealant for wall penetration
- Drain hose internal diameter 15 mm
- Drain hose internal diameter 17 mm (if a drain elbow is used)
- Hose clamp
- Thermal insulation or filler to seal the outdoor unit
- M8 hexagonal screws, washers and anchors with threaded inserts for the hydro module mounting plate
- Insulation for pipelines
- Heating circuit mixer closed-loop control
- Refrigerant R410A (R407C for HT series)
- Vacuum pump for manometer station

1.7 Installation sequence

1.7.1 Monobloc systems

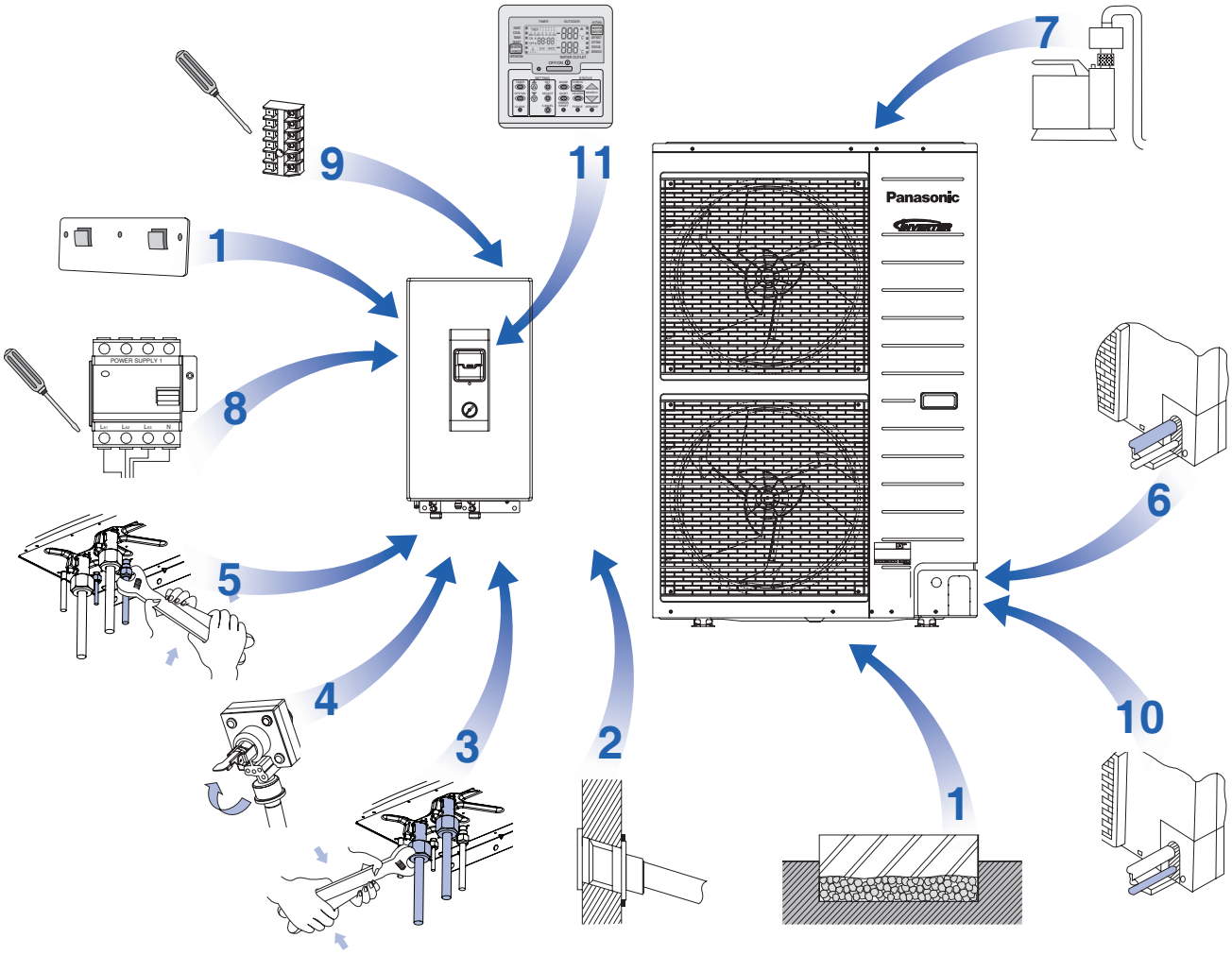
This installation manual is written so that the sequence of sections corresponds to the sequence of installation steps to be performed. For monobloc systems these are primarily as follows:



No.	Installation step	Section no.
1	Installing the device	4.1, 4.2
2	Connecting the water pipes	6
3	Filling and venting the system	6
4	Connecting the device to the electricity mains	8.1
5	Connecting inputs and outputs (interfaces)	8.2, 8.3.1
6	Installing the wired remote control	8.4
7	Commissioning	9.1, 9.2 ... 9.5

1.7.2 Split systems

This installation manual is written so that the sequence of sections corresponds to the sequence of installation steps to be performed. For split systems these are primarily as follows:



No.	Installation step	Section no.
1	Installing the device	4.1, 4.2
2	Creating a wall penetration	4.3
3	Connecting water pipes to the hydro module	7.1
4	Filling and venting the water pipes	7.1
5	Connecting refrigerant pipes to the hydro module	7.2
6	Connecting the hydro module and outdoor unit (refrigeration circuit)	7.4
7	Evacuating the refrigerant circuit	7.6
8	Connecting the hydro module to the electricity mains	8.1.2
9	Connecting inputs and outputs (interfaces) to the hydro module	8.2, 8.3.2
10	Connecting the hydro module and outdoor unit electrically	8.3.3
11	Commissioning	9.2 ... 9.5

2 Safety instructions

2.1 General hazard instructions for avoiding electric shocks

Danger!

Observe and comply with the following hazard instructions.
If you fail to do so, there is a danger of electric shock or fire.

- Only qualified electricians may perform the electrical installation work.
- All service and maintenance work must also be performed by a certified electrician or an authorised dealer.
- Keep children and persons who are unfamiliar with the system clear of the working area.
- When working on the device, comply with the national and local standards and regulations.
- The cables and electricity connections, including existing connections, must be suitable for the electrical capacity of the heat pump.
- Do not use non-approved mains cables, modified cables or extension cables to connect to the electricity mains.
- The device must be earthed correctly. It may not be earthed to gas or water pipes, lightning conductors or the earthing of the telephone system.
- Comply with the respective national wiring rules and safety precautions for fault current. Panasonic recommends that you use a RCD.

2.2 General hazard instructions to avoid damage to health

Danger!

Observe and comply with the following hazard instructions. If you fail to do so, there is a risk of fatal injury or damage to health.

- Work involving the refrigerant may only be performed by a qualified person or an authorised dealer with a refrigerant handling certificate.
- The refrigerant can cause freezing if it comes in contact with skin.
- Only use the refrigerant specified. The refrigerant may not be mixed with other types of refrigerant or replaced with other types of refrigerant. Using other refrigerants can damage the device and result in safety problems. The manufacturer accepts no responsibility or warranty if

refrigerants of types other than R410A are used for the Aquarea LT series and T-CAP or R407C for the Aquarea HT series.

- If there is a refrigerant leak during installation or operation, ventilate the room and extinguish any sources of fire. If you do not do so, contact with fire can result in toxic gases.
- Do not install the device in locations where leaks of flammable gases can occur. Otherwise there is a risk of fire or explosions.
- Install the refrigerant pipes correctly before switching on the compressor. If the refrigerant pipes are not tightly connected when the compressor is running, and the valves are opened, air is drawn in. That increases the pressure in the refrigerant circuit and results in a risk of explosion and injury, amongst others. Stop compressor operation before you remove the refrigerant pipes.
- Only use the monobloc device in sealed water systems. Use in an open-vented system can result in excessive corrosion of the water pipes and increase the risk of bacteria colonies forming in the water, legionella in particular.

2.3 General hazard instructions for avoiding material damage

Warning!

Observe and comply with the following instructions. If you do not, there is a risk of material damage, e.g. via vibration, water leaks or fire.

- All installation work for the water circuit must comply with all relevant European and national regulations (including EN 61770).
- The monobloc unit is only intended for external installation and may not be installed indoors.
- Use only enclosed or specified parts.
- If the monobloc unit is to be installed close to the sea, in highly sulphurous regions or regions with high oil-contents (e.g. machine oil etc.), its service life may be reduced.

2.4 General further information

NOTE

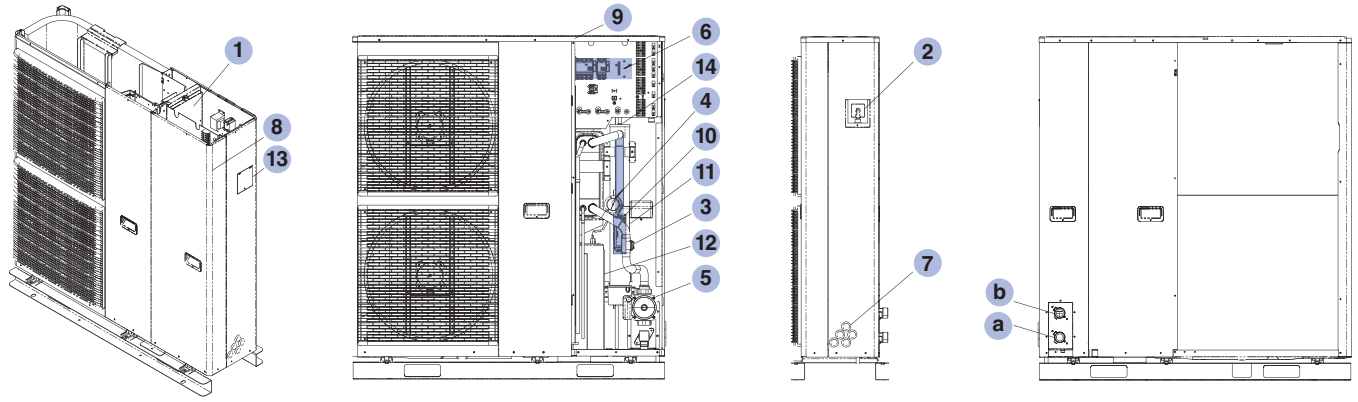
The following information provides recommendations or advanced assistance.

- Air/water heat pumps require planning permission in Wales and Northern Ireland and must meet certain criteria in England and Scotland to be classed as a permitted development. If in doubt, check with your local planning office.
- For details on preventing water pipes freezing and heat and cold protection, see the WRAS guidelines and BS EN 806 and BS 6700.
- The design handbook for split systems and monobloc systems contains further information on the device.

3 Device overview

3.1 Components

3.1.1 Monobloc systems



Component name

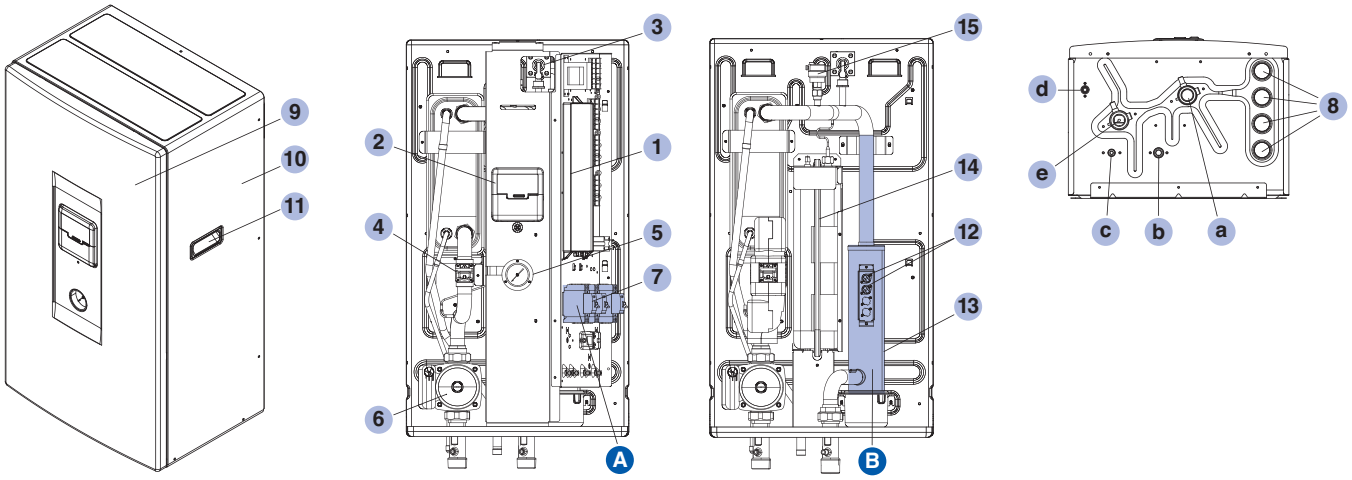
1. Electronic circuit board (view without upper cabinet panel)
2. Pressure relief valve (view without cover)
3. Flow rate cut-out
4. Manometer
5. 3-phase water recirculation pump (Figure shows standard pump)
6. RCD (differs from model to model)
7. Cable gland
8. Front panel
9. Upper cabinet panel
10. Temperature limit switch (differs from model to model)
11. Additional electric heater (3, 6 or 9 kW)
12. Expansion tank
13. Cover
14. Quick vent

Connection name

- a Water return Ø R 1¼
- b Water supply Ø R 1¼

Components of the monobloc unit with two fans

3.1.2 Split systems: Hydro module



Component name

1. Electronic circuit board
2. Operator control panel
3. Pressure relief valve
4. Flow rate cut-out
5. Manometer
6. 3-phase water circulation pump (Figure shows standard pump)
7. RCD (differs from model to model, see Detail A)
8. Cable gland
9. Chamber front panel
10. Chamber
11. Handle
12. Temperature limit switch (differs from model to model, see Detail B)
13. Additional electric heater for heat pump (3, 6 or 9 kW)
14. 10 l expansion tank
15. Quick vent

Connection name

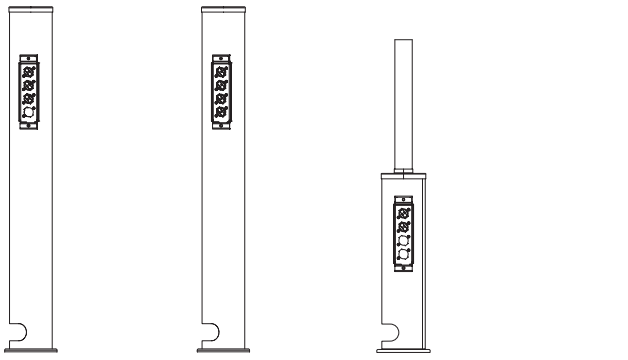
- a Water supply Ø R 1¼
- b Gas-side refrigerant connection (19.1 mm)
- c Liquid-side refrigerant connection (6.4 bis 9.5 mm)
- d Water drain
- e Water return Ø R 1¼

A Different RCDs

Single and three-phase, 3 to 9 kW

Single and three-phase, 12 to 16 kW

B Different additional electric heaters and temperature limit switches



Single-phase, 7 to 9 kW

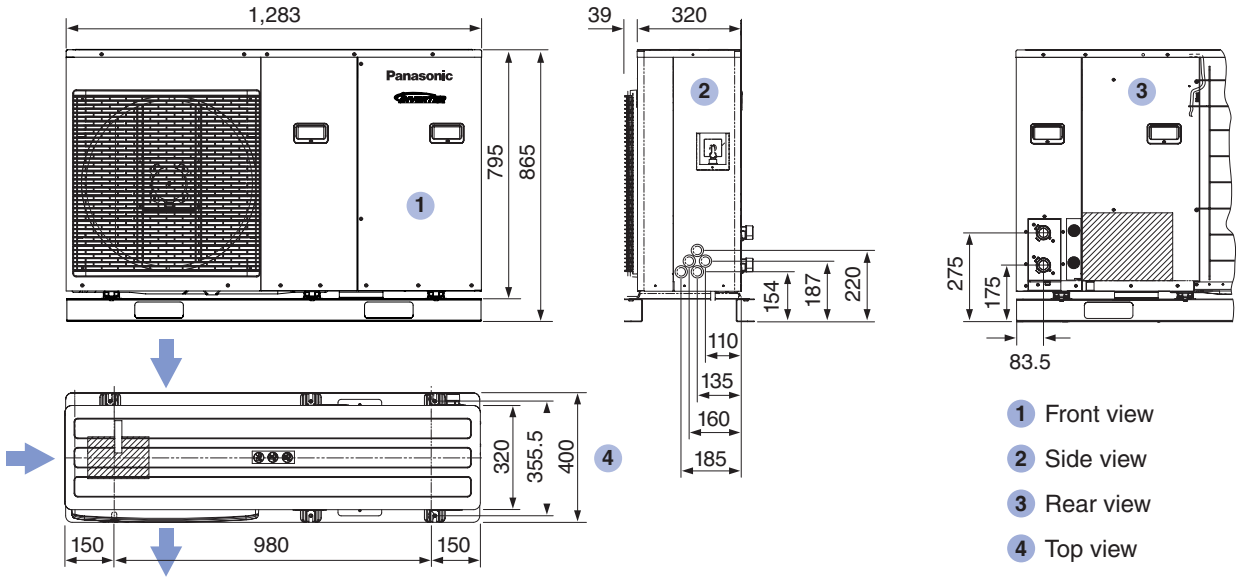
Single-phase, 12 to 16 kW

Three-phase, 12 to 16 kW and single-phase, 3 to 5 kW

Detail **A** (left) and **B** (right) for components of the hydro module

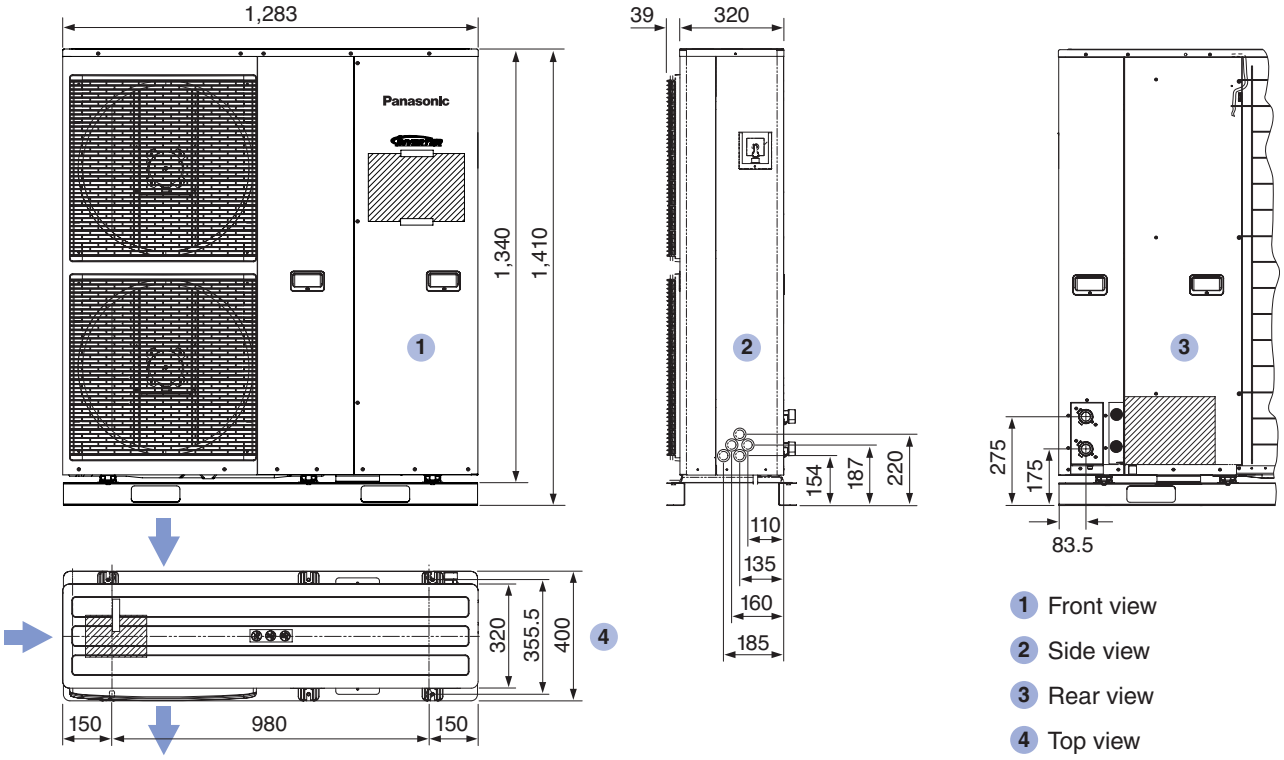
3.2 Dimensions diagram

3.2.1 Monobloc systems: Mini monobloc unit with a nominal output of 6 to 9 kW



Dimensions of monobloc unit with one fan in mm. The air flow is indicated by arrows.

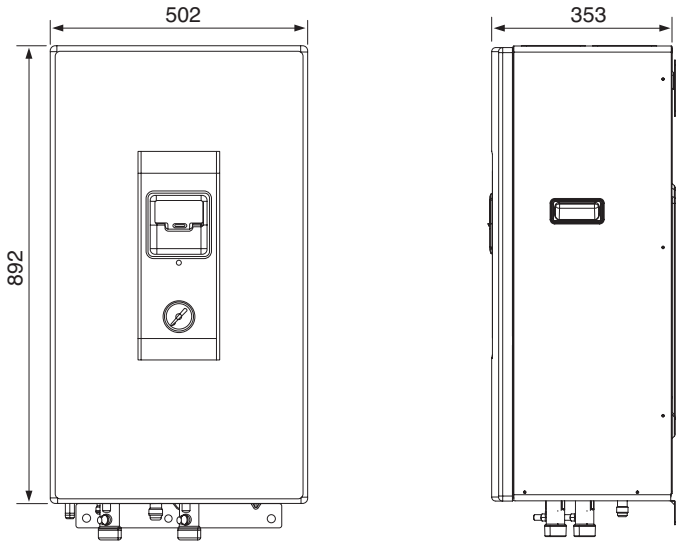
3.2.2 Monobloc systems: Monobloc unit with a nominal output of 9 to 16 kW

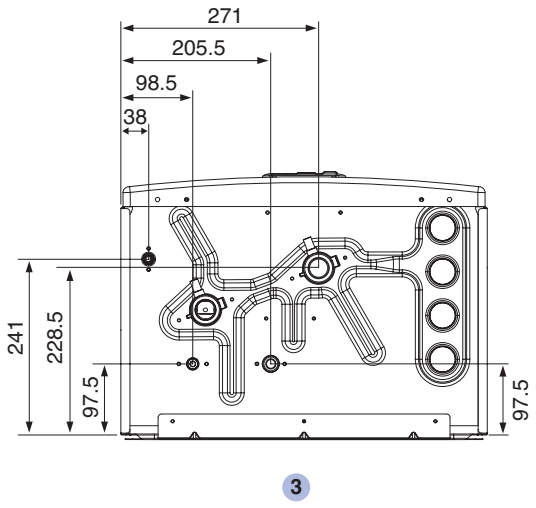


Dimensions of monobloc unit with two fans in mm. The air flow is indicated by arrows.

3.2.3 Split systems: Hydro module

1 Front view
2 Side view
3 Bottom view



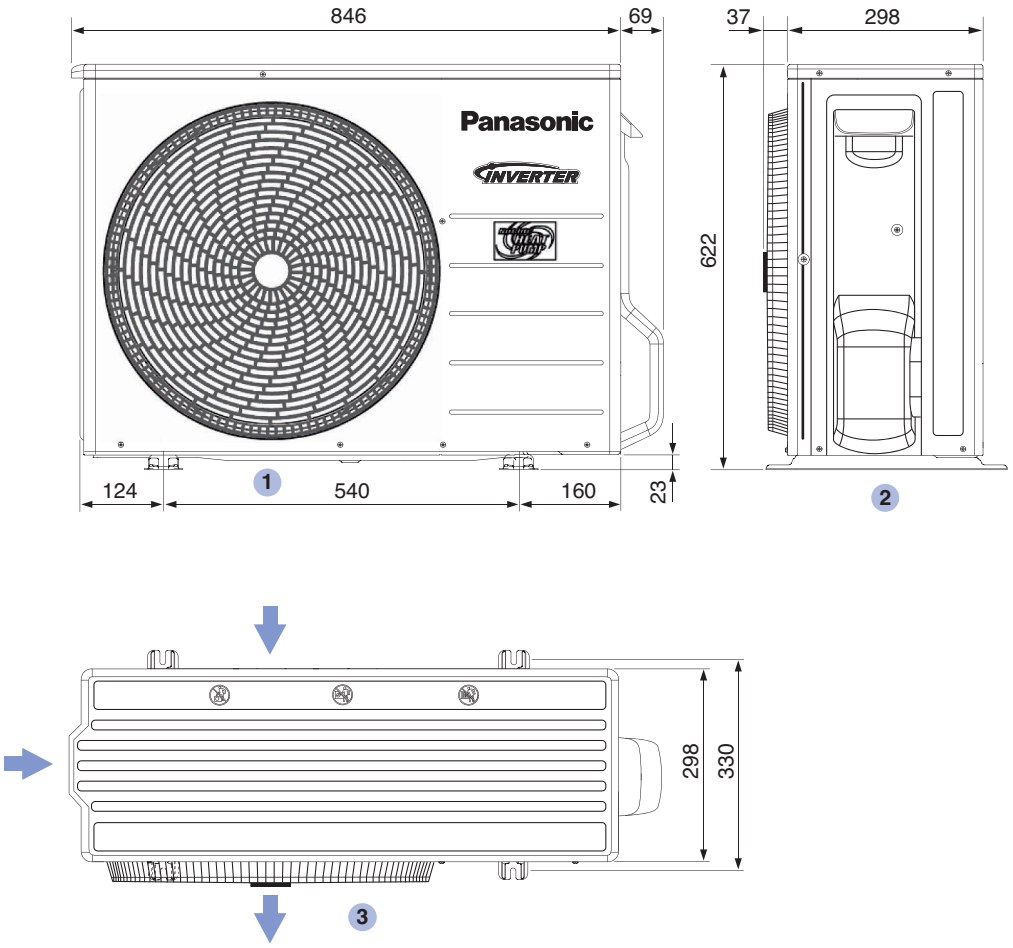


Hydro module dimensions in mm

3.2.4 Split systems: Outdoor units

Outdoor unit with one fan (3 and 5 kW)

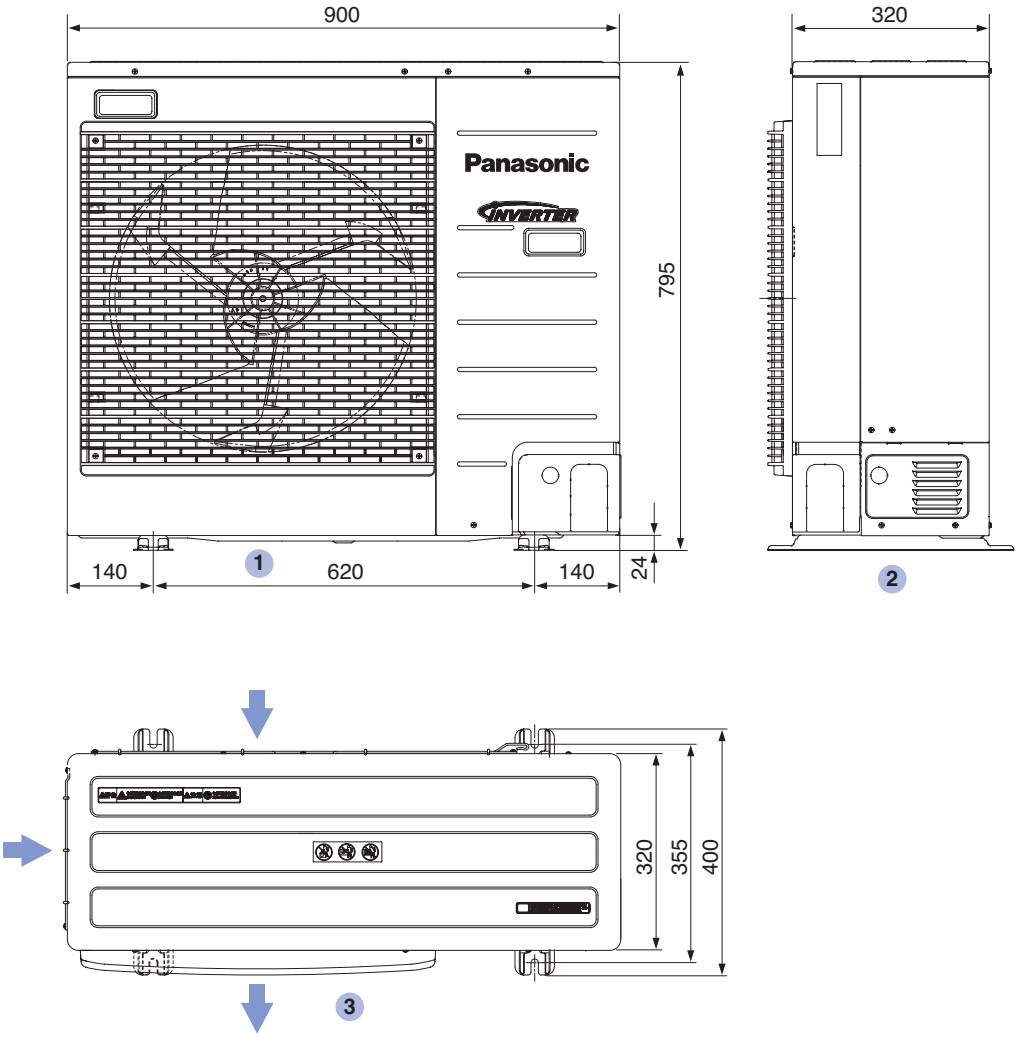
1. Front view
2. Side view
3. Top view



Dimensions of outdoor unit with one fan (3 and 5 kW) in mm.
The air flow is indicated by arrows.

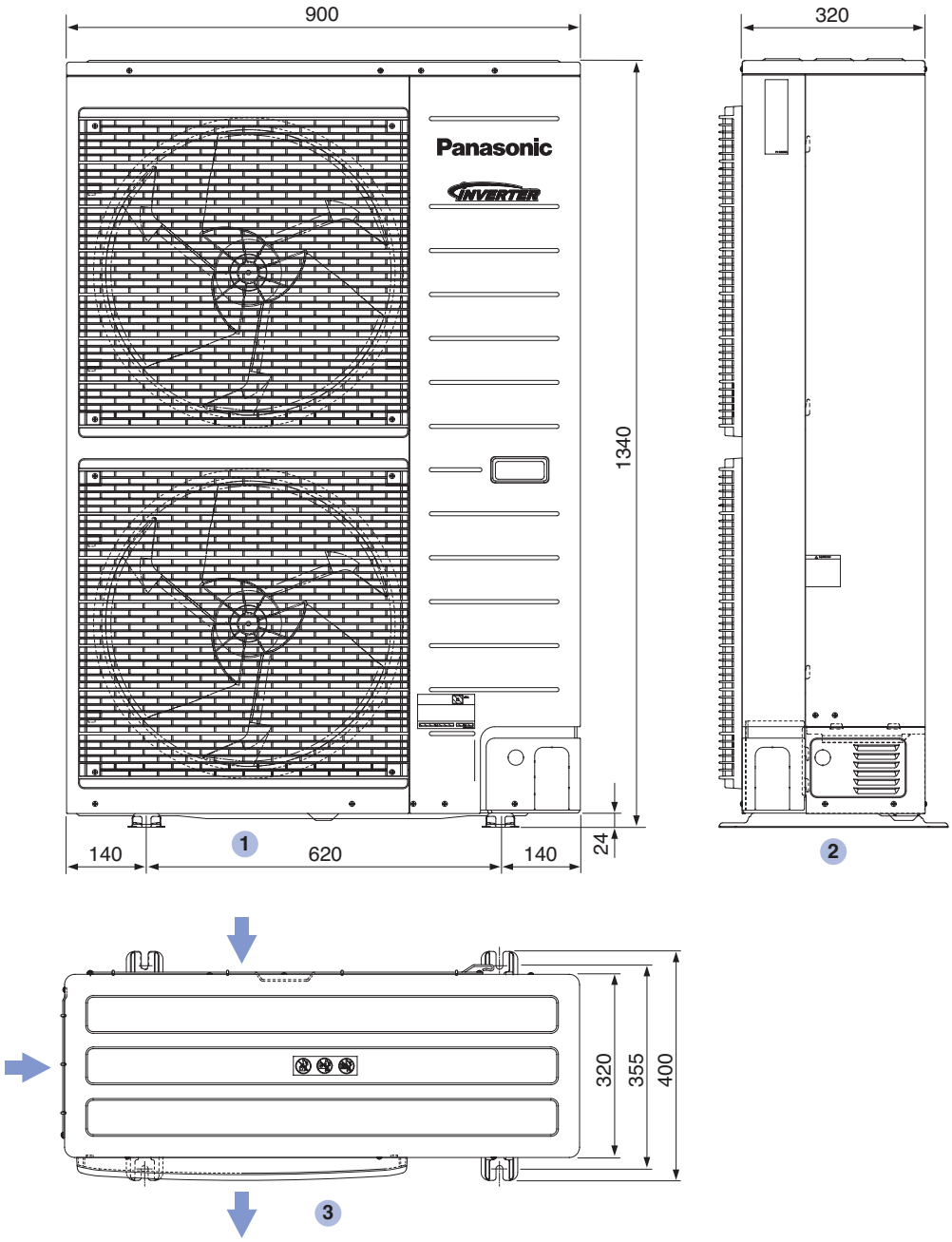
Outdoor unit with one fan (7 and 9 kW)

1 Front view
2 Side view
3 Top view



Dimensions of outdoor unit with one fan (7 and 9 kW) in mm.
The air flow is indicated by arrows.

Outdoor unit with two fans



1 Front view
2 Side view
3 Top view

Dimensions of outdoor unit with two fans in mm. The air flow is indicated by arrows.

3.3 Accessories

3.3.1 Monobloc systems

No.	Component	Quantity	Comments	Included
1	Drain elbow	1		×
2	Cable ties	3		×
3	Cable bush	2		×
4	Wired remote control	1		×
5	Add-on circuit board for solar thermal connection CZ-NS2P	1	Add-on circuit board for solar thermal connection (monobloc systems)	
6	Add-on circuit board for solar thermal connection CZ-NS2P	1	Add-on circuit board for solar thermal connection (mini monobloc systems)	
7	Hot-water tank WH-TD20E3E5-UK 200 litres WH-TD30E3E5-UK 300 litres	1	Stainless steel tank	
8	Hot-water tank HR 200 200 litres HR 300 300 litres	1	Enamelled	
9	Hot-water tank HR 300 300 litres HR 500 500 litres	1	Enamelled	
10	Temperature sensor installation set **CZ-TK1** for third party tanks	1	Sensor with cable and immersion sleeve for installation in third party tanks	
11	Additional casing heater unit **CZ-NE1P** for series: Aquarea T-CAP, Aquarea HT, Aquarea LT series mini monobloc units	1	Heating band attached on the floor plate inside the unit's casing to prevent the water incurred during defrosting from freezing	

3.3.2 Split systems

No.	Component	Quantity	Comments	Included
1	Mounting plate 1	1	For hydro module	×
2	Drain bend	1		×
3	Cable ties	3		×
4	Cable bush	2		×
5	Screw	3		×
6	Mounting plate 2	1	For hydro module	×
7	PS moulded part	2		×
8	Cable tie, long	4		×
9	Seal	1		×
10	Add-on circuit board for solar thermal connection CZ-NS1P	1	Add-on circuit board for solar thermal connection	
11	Hot-water tank WH-TD20E3E5-UK 200 litres, WH-TD30E3E5-UK 300 litres	1	Stainless steel tank	
12	Hot-water tank HR 200 200 litres HR 300 300 litres	1	Enamelled	
13	Hot-water tank HRS 300 300 litres HRS 500 500 litres	1	Enamelled	
14	Temperature sensor installation set **CZ-TK1** for third party tanks	1	Sensor with cable and immersion sleeve for installation in third party tanks	
15	Additional casing heater unit **CZ-NE1P** for series: Aquarea T-CAP Aquarea HT Mini monobloc unit from the Aquarea LT series	1	Heating band attached on the floor plate inside the unit's casing to prevent the water incurred during defrosting from freezing	

4 Location / Installing and fastening the devices

4.1 Location

4.1.1 Monobloc systems or splitsystem outdoor units

Weights of the monobloc units

Aquarea LT single-phase (one fan)	112 kg
Aquarea LT single-phase	153 kg
Aquarea LT three-phase	157 kg
Aquarea T-CAP single-phase	155 kg
Aquarea T-CAP three-phase	158 kg
Aquarea HT single-phase	155 kg
Aquarea HT three-phase	158 kg

Weights of the split system outdoor units

Outdoor unit 3 and 5 kW (one fan)	39 kg
Outdoor unit 7 and 9 kW (one fan)	66 kg
Outdoor unit* (two fans)	105 or 110 kg

*Depending on type

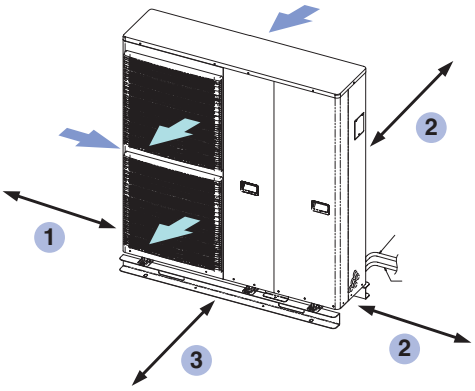
The installation location must meet the following criteria:

General

- Even and horizontal
- Load-bearing (see device weight table)
- No outside temperature under -20 °C (monobloc systems)
- Installation at a height sufficient to protect against weather influences such as snow or water levels
- The height difference of the liquid system circuit may not exceed 7 m (monobloc systems)
- Easy access for maintenance work
- Condensate must drain away easily
- No damage to other objects if water leaks
- If a solar installation is connected, the connection cable between the solar pump station and the monobloc unit may not be longer than 10 metres

Minimum clearances

- The minimum clearances (see Figure) must be observed.



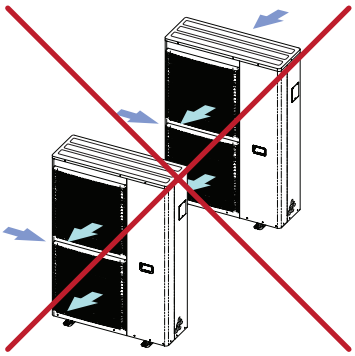
1	Minimum clearance	100 mm
2	Minimum clearance:	
	Monobloc systems	300 mm
	Split systems	100 mm
3	Minimum clearance	1,000 mm

Minimum clearances of the monobloc unit or split system outdoor unit to adjacent walls and objects, indicating the air flow direction.

Air circulation

- In general, choose an installation location with good air circulation
- No additional guards such as awnings etc.
- No sources of heat or steam nearby
- No objects nearby which could short circuit the exhaust air
- No direct wind impact on the suction side of the unit
- If multiple units are used, observe the minimum clearance between units

Incorrect



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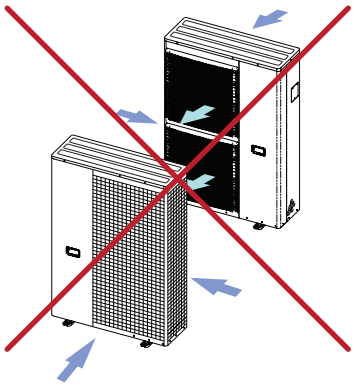
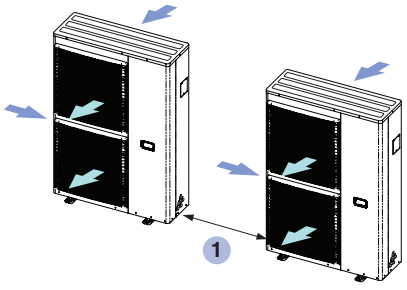


Correct



1 Minimum clearance 100 mm

Correct alignment of multiple monobloc units or split system outdoor units

Note
The design handbook for split systems and monobloc systems contains further information on soundproofing.

Soundproofing

- The operating noise of the monobloc unit or split system outdoor unit must not bother the user or neighbours.
- The sound output direction of the monobloc unit or split system outdoor unit should face the street side if possible, as neighbouring rooms which require protection seldom face in this direction.

4.1.2 Split systems: Height and length limitations

Warning!

The following criteria for the clearance between the hydro module and outdoor unit must be observed:

- The maximum length of the refrigerant pipelines between the hydro module and outdoor unit is 30 or 40 m depending on the model (see table or technical data). This value may not be exceeded.
- The minimum length of the refrigerant pipelines between the hydro module and outdoor unit is 3 m. Shorter pipelines are not permitted.
- The maximum height difference between the hydro module and outdoor unit is 5 up to 30 m depending on the model (see table or technical data). This value may not be exceeded.
- If the refrigerant pipelines are longer than the prefilled pipe length of the device, the stated quantity of additional refrigerant must be added, see the following table:

Model	Nominal length (m)	Max. height difference (m)	Min. pipe length (m)	Max. pipe length (m)	Prefilled pipe length (m)	Additional refrigerant fill quantity per metre (g/m)
SDF03E3E5 / UD03EE5 SDF05E3E5 / UD05EE5 SDC03E3E5 / UD03EE5 SDC05E3E5 / UD05EE5	7	5	3	15	10	20
SDC07C3E5 / UD07CE5 SDC09C3E5 / UD09CE5 SDF07C3E5 / UD07CE5 SDF09C3E5 / UD09CE5	7	20	3	30	10	30
SDC09C3E8 / UD09CE8 SDC12C9E8 / UD12CE8 SDC14C9E8 / UD14CE8 SDC16C9E8 / UD16CE8 SDC12C6E5 / UD12CE5 SDC14C6E5 / UD14CE5 SDC16C6E5 / UD16CE5 SDF09C3E8 / UD09CE8 SDF12C9E8 / UD12CE8 SDF14C9E8 / UD14CE8 SDF16C9E8 / UD16CE8 SDF12C6E5 / UD12CE5 SDF14C6E5 / UD14CE5 SDF16C6E5 / UD16CE5	7	30	3	40	30	50
SXC09D3E5 / UX09DE5 SXC12D6E5 / UX12DE5 SXC09D3E8 / UX09DE8 SXC12D9E8 / UX12DE8 SXF09D3E8 / UX09DE8 SXF12D9E8 / UX12DE8 SXF09D3E5 / UX09DE5 SXF12D6E5 / UX12DE5	7	20	3	30	15	50
SHF09D3E5 / UH09DE5 SHF12D6E5 / UH12DE5	7	20	3	30	15	70

4.1.3 Split systems: Hydro module

NOTE

Depending on the model, the hydro modules weigh between 43 and 52 kg.

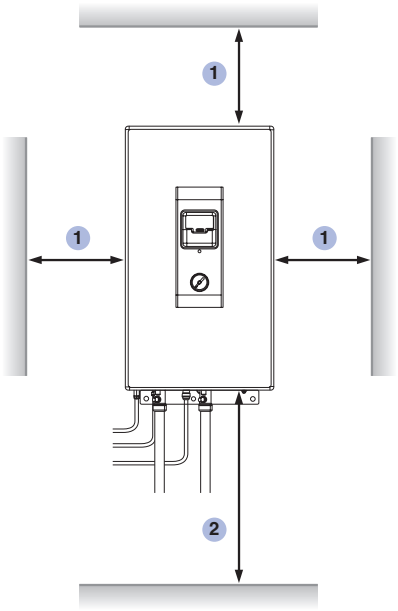
Warning!

The installation location must meet the following criteria:

- The hydro module is only suitable for indoor installation.
- The hydro module may not be installed in the vicinity of sources of heat or steam. Laundry rooms or other very humid rooms are unsuitable, as the humidity can cause rust and damage the device.
- Good air circulation must be guaranteed.
- The room must have at least a minimum room volume of V_{min}, if no special machine room in accordance with BS EN 378 – Part 1 is available as a location.

$$V_{min} = \frac{G}{c}$$

G = Refrigerant fill quantity in kg
c = Practical limit in kg/m³ (for R410A c = 0.44 kg/m³ and for R407C c = 0.31 kg/m³)



1 Minimum clearance 300 mm
2 Minimum clearance 600 mm

Minimum clearances of the hydro module to walls, ceiling and floor

- The condensate from the condensate outlet of the hydro module must drain away without trouble, as it can cause damage if not drained correctly.
- The hydro module must be installed vertically on the wall. The wall must be strong and solid to prevent vibrations.
- Mount the device close to the door.
- It must be installed at a height of at least 800 mm.
- Observe the minimum clearances (see figure).

The following must also be observed:

- Consider the noise the circulation pump causes in the room.
- If the optional solar pump station cable is connected to the hydro module and the solar pump station, the two devices should be between two and eight metres apart. The solar pump station cable must be at least 10 metres long. If not, system malfunctions can result.

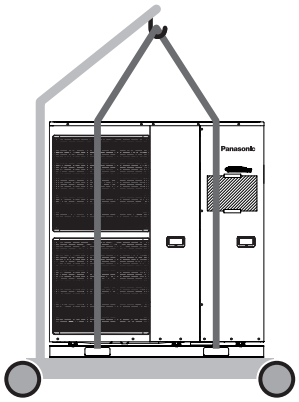
4.2 Installation

4.2.1 Installing the monobloc unit or split system outdoor unit

Danger!

Multiple persons are required to install the monobloc unit or split system outdoor unit. Otherwise, the weight of the unit can lead to injuries.

Transport and lifting equipment must be suitable for the unit weight.

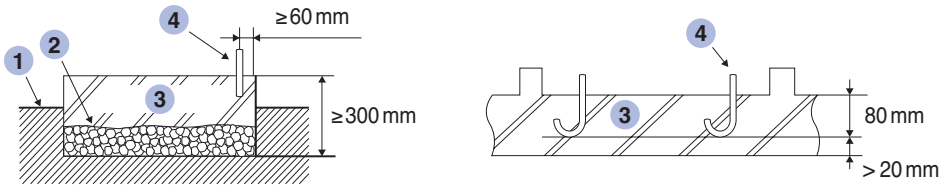


If possible, the monobloc unit or split system outdoor unit should only be moved with the appropriate transport and lifting equipment. The lifting equipment can be attached to the base structure of the unit using lugs.

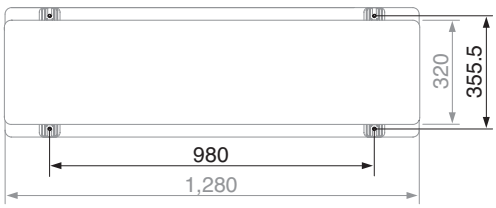
- ➤ Transport the unit to the planned installation location.
- ➤ Remove the packaging carefully.
- ➤ Fasten the unit with four M12 anchor bolts (tightening force > 15,000 N)

Transport the unit carefully to avoid damage. That includes placing/ lowering the unit in the installation location.

1. Floor
2. Stone / gravel
3. Concrete or floor plate
4. Anchor bolt



Minimum requirements for anchoring the monobloc unit to the floor or a foundation (left) or directly to a base plate (right)



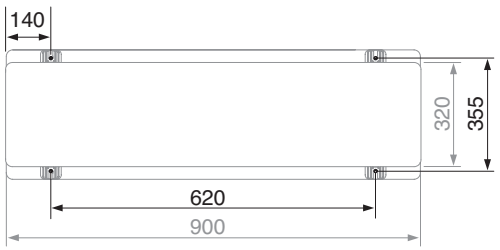
Monobloc unit drilling template

Warning!

A correct drain or soak away must be installed to allow the condensate from the condenser to disperse fully. Failure to observe this may cause a slip hazard if allowed to freeze around the condenser. Internal damage can also occur if not drained correctly.

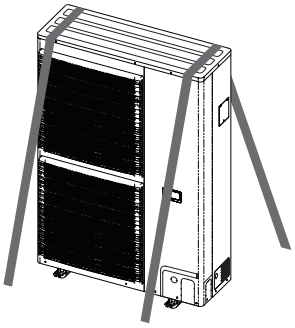
➤ Fasten the split system outdoor unit to a concrete foundation or a stable base frame, e.g. to the exterior wall of a building, using M10 screws as shown. Ensure that the outdoor unit is installed horizontally level.

When fastening the split system outdoor unit on a base frame/bracket to the exterior wall of the building, vibration absorbers must be mounted under the outdoor unit. If fastened to a concrete foundation, we recommend using vibration absorbers.



Split system outdoor unit drilling template

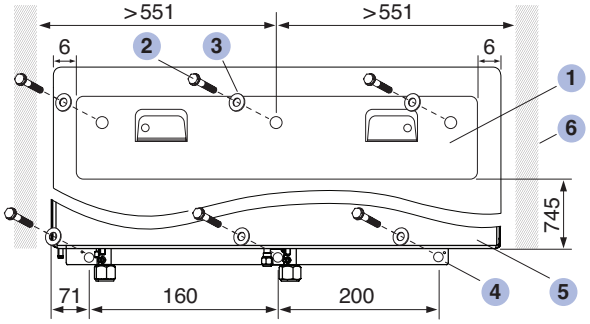
For installation locations which can be impacted by strong winds, e.g. wind between buildings, including building roofs, the monobloc unit or split system outdoor unit must be secured on-site with additional protection to prevent it toppling over.



Protection against toppling over via anchoring

4.2.2 Fastening the hydro module

1 Mounting plate 1
2 M8 hexagon bolt
3 Washer
4 Mounting plate 2
5 Hydro module housing
6 Wall



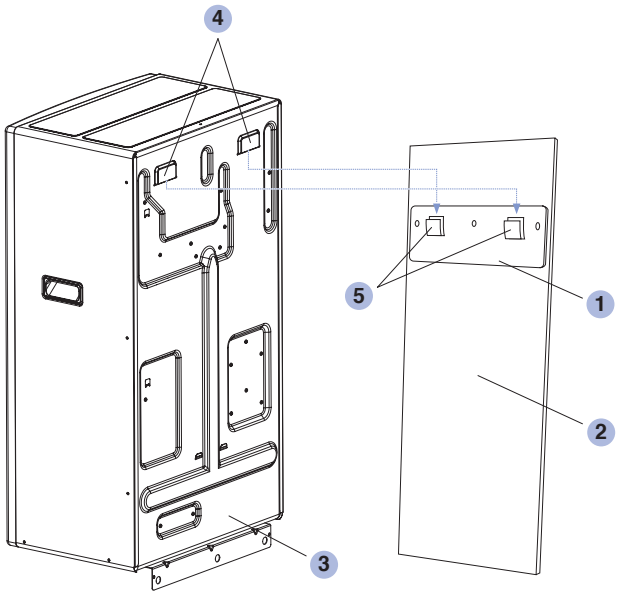
Dimensions of mounting plates 1 and 2

⚠ Danger!
At least two persons are required for installation work. Otherwise, the weight of the device can lead to injuries.

➤ Unpack the hydro module carefully.

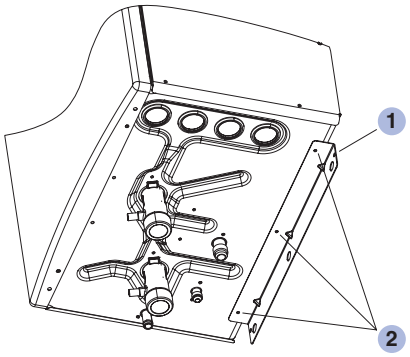
➤ Fasten the two mounting plates as shown in the figure with six M8 hexagon screws, washers and anchors with threaded inserts (all to be provided by the customer). Ensure that it is installed horizontally (use a spirit level). Observe the minimum clearances to the wall and floor entered in the figure.

1 Mounting plate 1
2 Wall
3 Hydro module
4 Slots
5 Hook
6 Wall



➤ Lift up the hydro module (two persons) and position the hooks of mounting plate 1 in the slots at the rear of the hydro module. Ensure that the hooks are correctly in place by moving them to the left and right.

1 Mounting plate 2
2 Screws



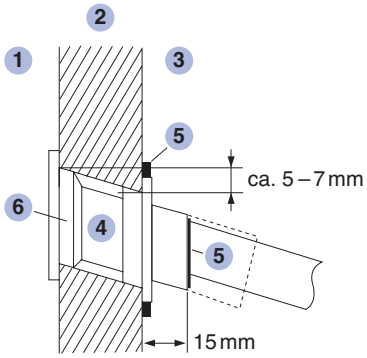
➤ Also secure the hydro module to mounting plate 2 via three Phillips head screws.

4.3 Wall penetration for split systems

Warning!

In cavity walls, use a wall gland to prevent rodents biting the pipes.

1 Inside
2 Wall
3 Outside
4 Bushing for pipe gland
5 Sealant
6 Pipe gland ø 70 mm



➤ Drill a 70 mm-diameter hole through the wall at a suitable place. The penetration must be made with an upward slope of 5 to 7 mm towards the inside, as shown in the figure.

➤ Optionally you can insert a suitable wall gland or DN 70 bushing (to be provided by the customer) into the wall penetration. If necessary, cut the bushing so that it protrudes roughly 15 mm on the outside.

➤ After laying all lines, seal the outside with suitable sealant (to be provided by the customer).

5 Opening the device

5.1 Monobloc systems or split system outdoor units

Danger!

The work may only be performed by qualified or certified personnel.

Ensure that the monobloc unit or the split system outdoor unit and hydro module are disconnected from the power supply before you perform the steps listed below.

Removing the front panel

- Remove the fastening screws
- Push the front panel of the cabinet downwards to release the safety catches.
- Pull the front panel forwards to remove it.

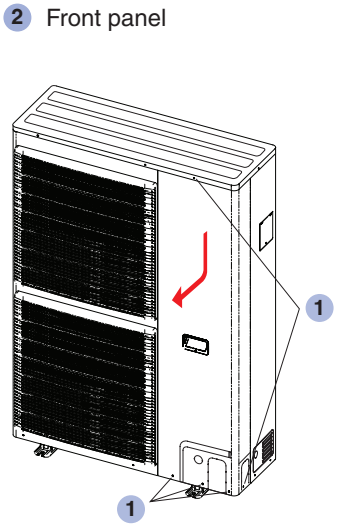
Reverse the steps accordingly to close the unit.

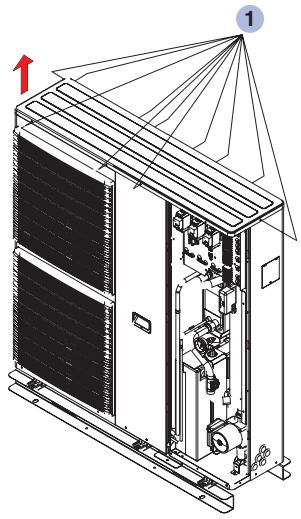
Removing the upper cabinet panel

- Remove the fastening screws.
- Lift the upper cabinet panel from the unit.

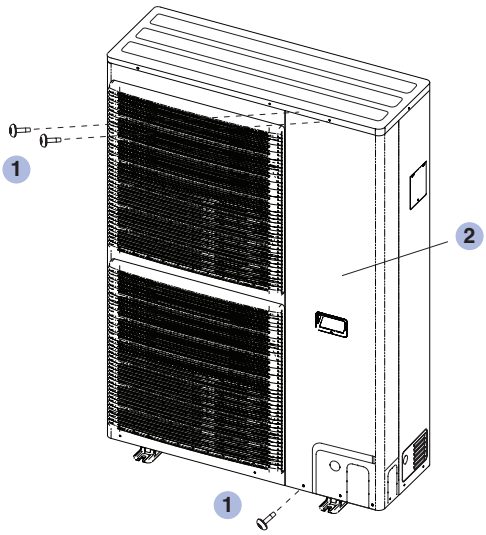
Reverse the steps accordingly to close the unit.

1 Fastening screws
2 Front panel





Monobloc unit



Split system outdoor unit

5.2 Split systems: Hydro module

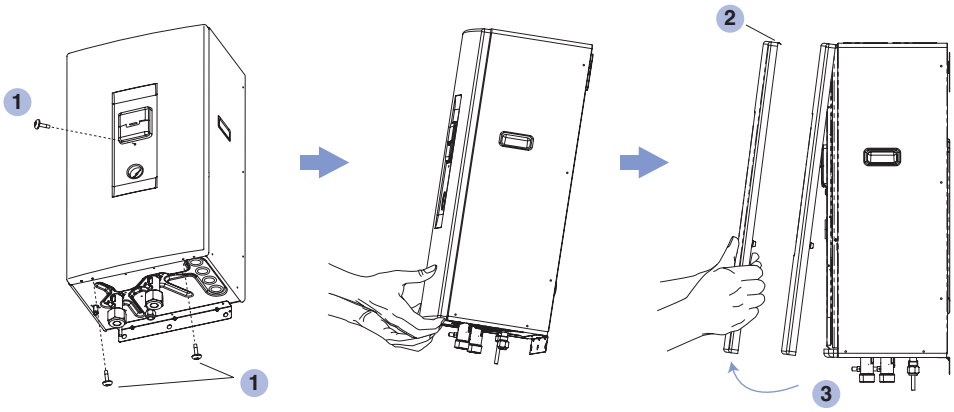
Danger!

The work may only be performed by qualified or certified personnel.

Ensure that the entire power supply (e.g. power supply of the hydro module, the storage tank, the electric immersion heater) is disconnected before performing the steps below.

Removing the front panel

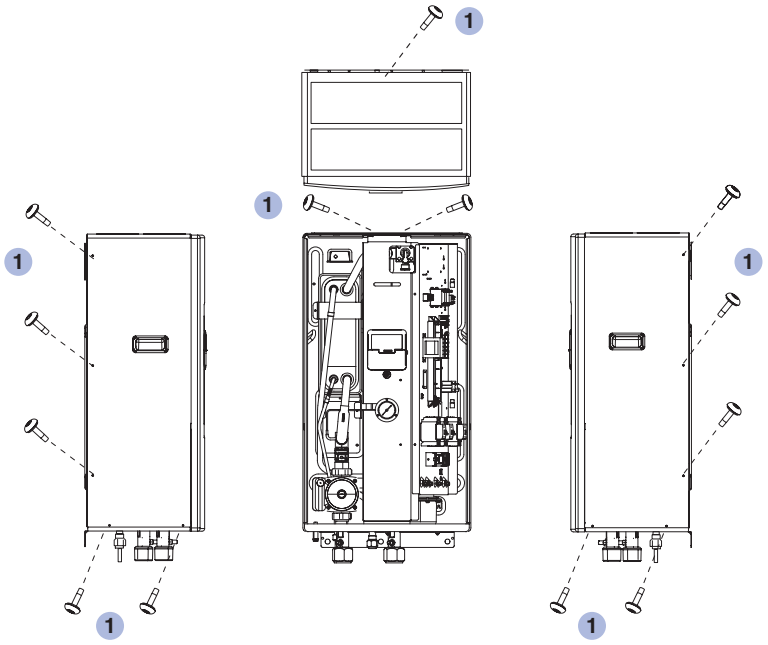
1 Screws
2 Hooks
3 Raise



- Remove two fastening screws from the bottom of the front panel and one from the front of the front panel.
- Carefully pull the lower part of the front panel towards you, to release the front panel from the left and right hooks, and remove the front panel.
- Reverse the procedure to assemble the device, ensuring that the right and left hooks snap into place correctly.

Removing the side housing

1 Fastening screws



- ➤ Remove the front panel as described above.
- ➤ Remove the left or right side housing by opening five fastening screws as shown above.
- ➤ Remove the upper side housing by opening three fastening screws.
- ➤ Reverse the procedure to re-assemble the housing.

6 Hydraulic installation for monobloc systems

Danger!

The work can only be performed by qualified or certified personnel.

Follow these instructions to prevent damage to the monobloc unit and the other components of the system:

- Flush the pipelines before connecting the device, to remove impurities. Impurities can damage the components of the device.
- Ensure that the components installed in the wet circuit can withstand high operating water pressures. Use only suitable sealants which can withstand the pressure and temperature of the system.
- Never use worn pipes.
- Do not use a pipe wrench to mount the connections. Use two adjustable wrenches to tighten the connection.

Warning!

There must be at least 50 litres (for 12.0 to 16.0 kW devices) or 30 litres (for 3.0 to 9.0 kW single fan deck) of liquid in the system. If these values are not reached, an additional storage tank must be installed.

The standard expansion tank can be used for heating systems with a total water quantity in the system of less than 200 litres (without a hot-water tank) and a static system height of no more than 7 metres (difference of the highest point of the system to the expansion tank).

If the total water quantity is greater than 200 litres or greater static heights are required, pressure retention must be ensured via an expansion tank to be installed by the customer. In general, the pressure level of the pressure relief valve must be observed. See the technical details for the pressure level, to a maximum of 3 bar.

Aquarea heat pumps may only be installed as sealed systems without direct contact of the heating water to the ambient air.

NOTE

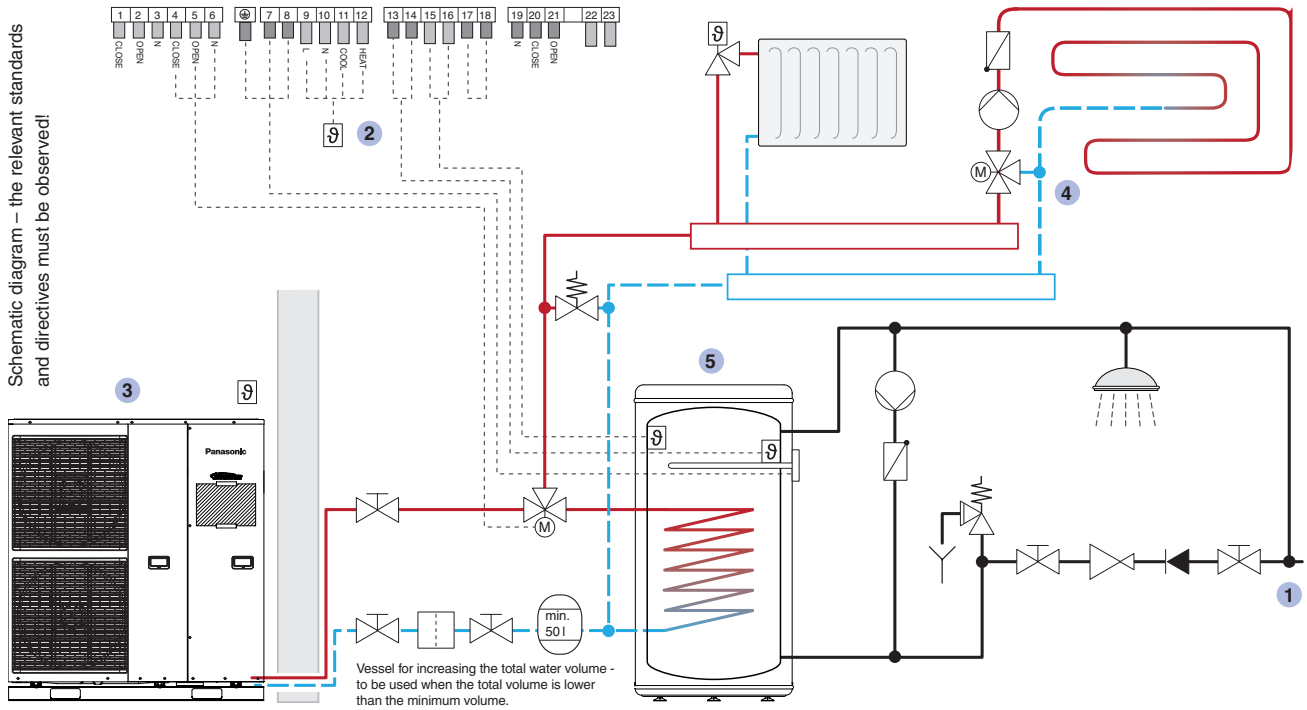
The monobloc units feature an expansion tank as standard (approx. 10 litres of air capacity, initial pressure of 1 bar). By contrast, the mini monobloc units WH-MDF06E3E5 and WH-MDF09E3E5 with heating capacities of 6 and 9 kW have an expansion tank with only 6 litres of volume. Accordingly, these devices can only be used for heating systems with a total water quantity in the system of under 150 litres.

See the design handbook for split systems and monobloc systems for connection variants.

Description of the functions of the sample hydraulic installation with water heating and heating

The hot-water tank 5 is supplied with heat as an alternative to the heating circuits. For this purpose, the heat pump controller opens the three-way directional valve towards the hot-water tank. Then, the hot-water tank is charged to the target temperature with appropriate supply temperature.

In heating mode, the heat pump controller opens the three-way directional valve towards the heating circuits and supplies them with heat. The supply temperature is controlled based on the outside temperature 3 and corresponds to the required temperature of the hottest heating circuit for mixed heating circuits. Heating circuits with lower supply temperatures must be adjusted to the right temperature using heating circuit mixers 4 (to be provided by the customer) by adding return heating water. A room thermostat 2 (to be provided by customer) deactivates heating mode of the heat pump when it reaches the target room temperature and prevents further activation and deactivation of the heat pump. An overflow valve between the supply and return pipes ensures that the minimum volume flow of the heat pump is guaranteed, even with thermostatic radiator valves and heating circuit mixers.



1 Cold water connection
2 Room thermostat
3 Outside temperature sensor (integrated in outdoor unit)
4 Heating circuit mixer closed-loop control (to be provided by customer)
5 Hot-water tank WH-TD20B3E5

Sample hydraulic installation with water heating and heating system (see Aquarea design handbook for other examples)

Legend

	3-way directional valve/ 3-way mixer
	Drain funnel
	Shutoff valve
	Pressure-reducing valve
min. 50 l	Storage tank for minimum volume

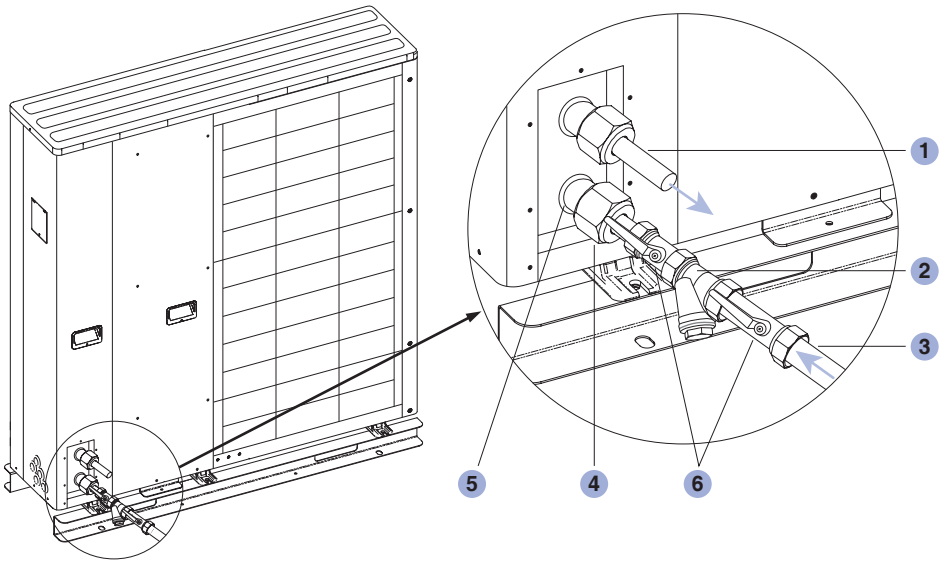
	Manometer
	Pump
	Non-return valve
	Dirt trap
	Pressure relief valve
	Temperature sensor

	Thermostatic radiator valve/ Single room controller valve
	Overflow valve
	Water tapping point
	Return
	Supply
	Control wire

➤ Open the monobloc unit as described in section 5.1.

➤ Install the pipes, valves, dirt trap and other components in accordance with the design documents.

1 Water supply WATER OUT
2 Dirt trap
3 Water return WATER IN
4 Union nut
5 Connection
6 Shutoff valve



Position of the dirt trap

⚠ Warning!
Hydraulic decoupling between the heat pump circuit and heat emitter circuit is always required when using Aquarea heat pumps with high efficiency pumps – overflow valves may not be used.

➤ Install a dirt trap (to be provided by the customer) upstream of the water inlet (water return) of the monobloc unit (grid width at least 500 to 600 µm) to protect the heat pump. We recommend installing a shutoff valve upstream and downstream of the dirt trap, to make subsequent maintenance work on the dirt trap easier.

➤ Install an overflow valve if no hydraulic decoupling (e.g. hydraulic switch or storage tank) is planned. Ensure that the overflow valve is not designed for the minimum volume flow, but for the nominal volume flow of the respective heat pump.

⚠ Warning!
In cooling mode, humid air can condense on the surface of the heat transfer systems if the temperature drops below the dew point. This can damage the building or make the floor slippery. As a result, you must install suitable positioned dew point sensors to ensure that temperatures lower than the dew point do not occur or drain any condensate which forms reliably. In addition, the pipelines affected must be insulated impermeably.

➤ If a heat pump with a cooling function is used, install a 2-way directional valve to deactivate the heating circuits in cooling mode, where applicable.

➤ Install the 3-way directional valve (to be provided by the customer) to switch from heating mode to water heating mode and vice versa. As standard, the valve should be open towards the heating circuit (contacts 4 and 6 are closed). The valve must also be CE compliant and may not exceed the peak load of 12 VA.

➤ Use Rp 1¼" nuts to connect the water inlet (labelled WATER IN) and water outlet (labelled WATER OUT). Use a torque wrench to tighten it, and apply the correct torque: 117.6 Nm .

➤ Close the supply (water outlet) and return (water inlet) of the monobloc unit at the heat exchanger of the hot-water tank. Ensure that you do not confuse the connections (supply = top, return = bottom).

➤ Install a device for draining the system (to be provided by the customer).

➤ Insulate the pipes in accordance with the latest UK building regulations, although the below is recommended:

Type of pipes/Fittings	Minimum thickness of insulation layer
Internal diameter up to 22 mm	40 mm
Internal diameter from 22 mm to 35 mm	60 mm
Internal diameter from 35 mm to 100 mm	2 × internal diameter

Recommended thermal insulation of heat distribution and hot water pipes

⚠ Warning!
In monobloc systems, there is a risk of freezing if the heating circuit is filled with water and the outside temperature falls below +4 °C. That can cause significant damage to the device.

The customer is responsible for ensuring that the device does not freeze. Please use one of the following options to do so:

- The heating circuit is operated with a food safe antifreeze mixture (40 % propylene glycol mixture) for temperatures down to -20 °C)
- An additional heater unit in the monobloc unit prevents the heating circuit freezing.
- The heating circuit is drained by a system to be provided by the customer (manual or automatic).

⚠ Warning!
To prevent damage to the heat pump from lime scale, please consult BS 7593 “Code of practice for treatment of water in domestic hot water central heating systems”.

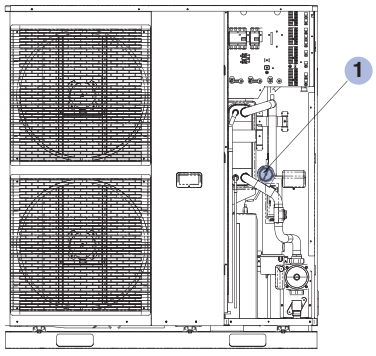
➤ Fill the system as follows:

➤ Open all thermostatic radiator valves of the heating system, and all other shutoff valves where applicable.

➤ Connect a filling hose (evacuated if possible) to the system.

⚠ Warning!
Water quality shall be in accordance with European Council Directive 98/83EC. In particular:

Chloride	max. 200 mg/l
Sulphate	max. 200 mg/l
Combined Chloride/Sulphate	max. 300 mg/l

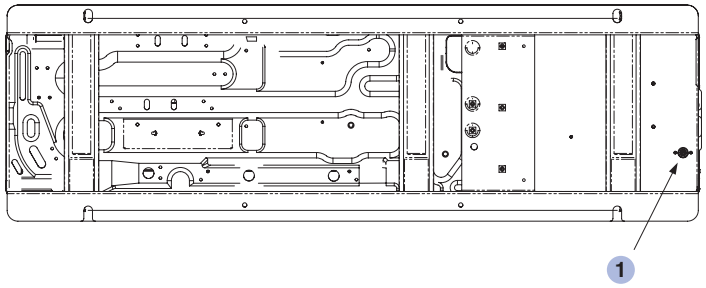


1 Manometer

➤ Keep adding water or antifreeze mix until the manometer reaches the nominal pressure.

➤ Vent the system (see the Commissioning section (9)). Then check the pressure again and add liquid if necessary

1 PRV release point is from the primary heating circuit and may contain additives and antifreeze which needs to be disposed of correctly.



⚠ Warning!
If the device is used in areas where the temperature can remain below zero for 2 to 3 days, condensate pipes should not be used, as the condensate could freeze, which can cause malfunctions.

➤ Proceed as follows to install a condensate pipe to drain condensate formed in the monobloc unit during operation:

- ➤ Use a drain hose with an internal diameter of 15 mm.
- ➤ Connect the drain hose to the monobloc unit.
- ➤ Lay the drain hose with a downward slope. For long drain hoses, use a metal support if necessary to prevent the hose bending.
- ➤ Lay the drain hose so that closures or blockages cannot occur.
- ➤ Do not insert the drain hose in a waste water system from which aggressive gasses such as ammonia gas, sulphur gas etc. can escape.

7 Installing the heating and refrigeration circuits for split systems

Danger!

The work may only be performed by qualified or certified personnel.

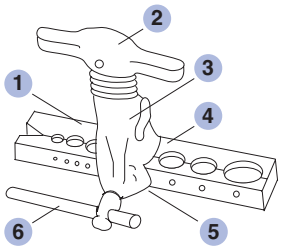
Warning!

Aquarea heat pumps may only be installed as sealed systems without direct contact of the heating water to the ambient air. Addition of oxygen in open vented systems can lead to excessive corrosion of the pipelines and resulting problems in operation.

When cutting and beading the pipes, observe the following specifications to prevent leaks and device malfunctions:

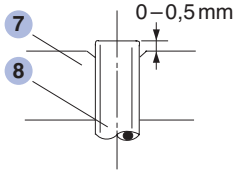
- Only copper pipes which comply with the requirements of EN 12 735-1 for refrigerant pipes used in cooling and air conditioning systems may be used.
- Use a pipe cutter to cut the pipes to length.
- Use a deburrer to remove burrs.
- When deburring the pipes, hold the pipe end facing down to prevent burrs falling into the pipe.
- Bead the pipe ends after pushing the flare nuts into place.
- Correct beading has an even thickness and is shiny. Ensure that the surface which is in contact with the connecting piece is completely smooth.

1 Latch
2 Handle
3 Yoke
4 Core
5 Arrow mark
6 Clamp handle

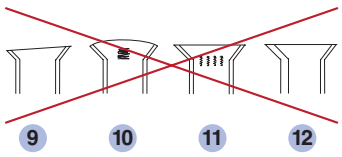


Pipe expander

7 Latch
8 Copper pipe



9 Crooked
10 Surface damaged
11 Cracked
12 Uneven thickness



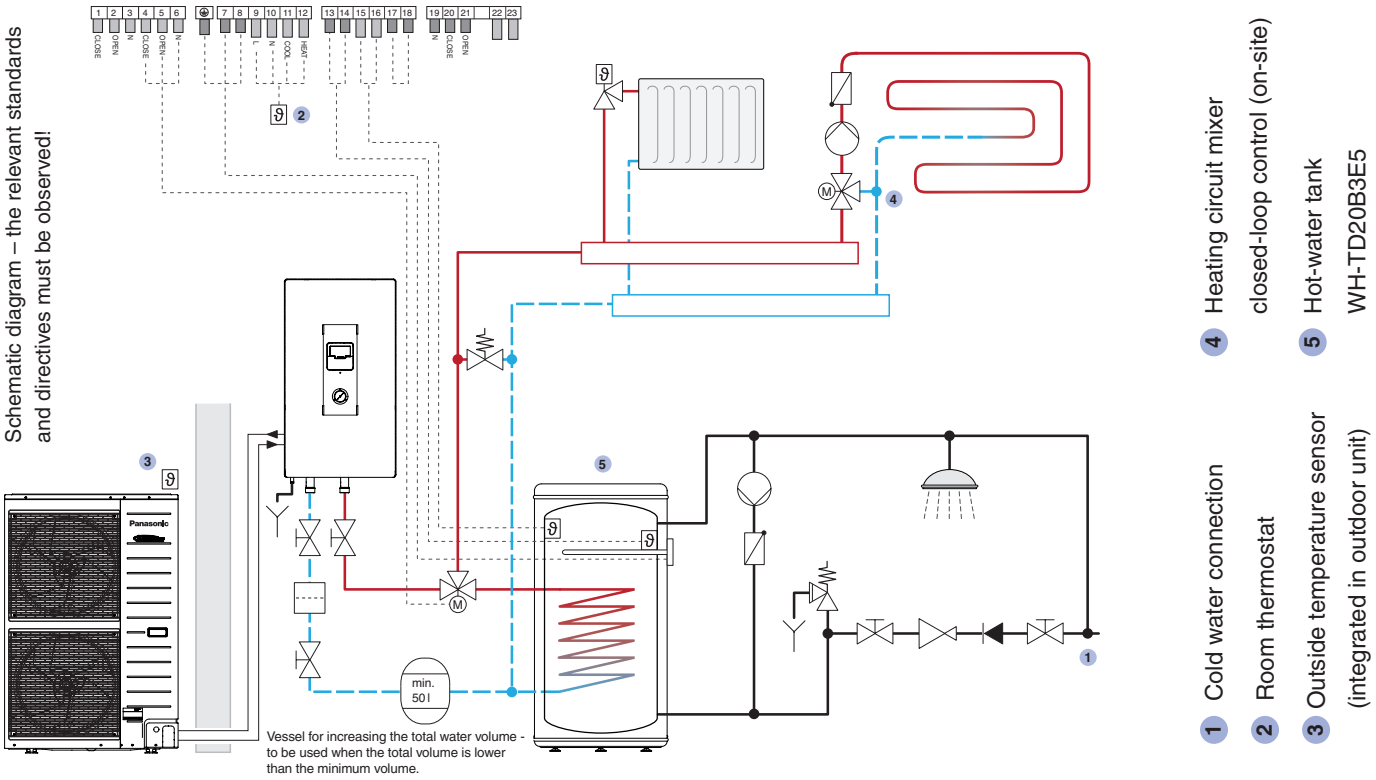
Incorrect beading

7.1 Connecting the water pipes to the hydro module

Description of the functions of the sample hydraulic installation with water heating and heating

The hot-water tank 5 is supplied with heat as an alternative to the heating circuits. For this purpose, the heat pump controller opens the three-way directional valve towards the hot-water tank. Then, the hot-water tank is charged to the target temperature with appropriate supply temperature.

In heating mode, the heat pump controller opens the three-way directional valve towards the heating circuits and supplies them with heat. The supply temperature is controlled based on the outside temperature 3 and corresponds to the required temperature of the hottest heating circuit for mixed heating circuits. Heating circuits with lower supply temperatures must be adjusted to the right temperature using heating circuit mixers 4 (to be provided by the customer) by adding return heating water. A room thermostat 2 (to be provided by customer) deactivates heating mode of the heat pump when it reaches the target room temperature and prevents further activation and deactivation of the heat pump. An overflow valve between the supply and return pipes ensures that the minimum volume flow of the heat pump is guaranteed, even with thermostatic radiator valves and heating circuit mixers.



Sample hydraulic installation with water heating and heating system (see Aquarea design handbook for other examples)

Legend

	3-way directional valve / 3-way mixer
	Drain funnel
	Shutoff valve
	Pressure-reducing valve
min. 50 l	Storage tank for minimum volume

	Manometer
	Pump
	Non-return valve
	Dirt trap
	Pressure relief valve
	Temperature sensor

	Thermostatic radiator valve / Single room controller valve
	Overflow valve
	Water tapping point
	Return
	Supply
	Control wire

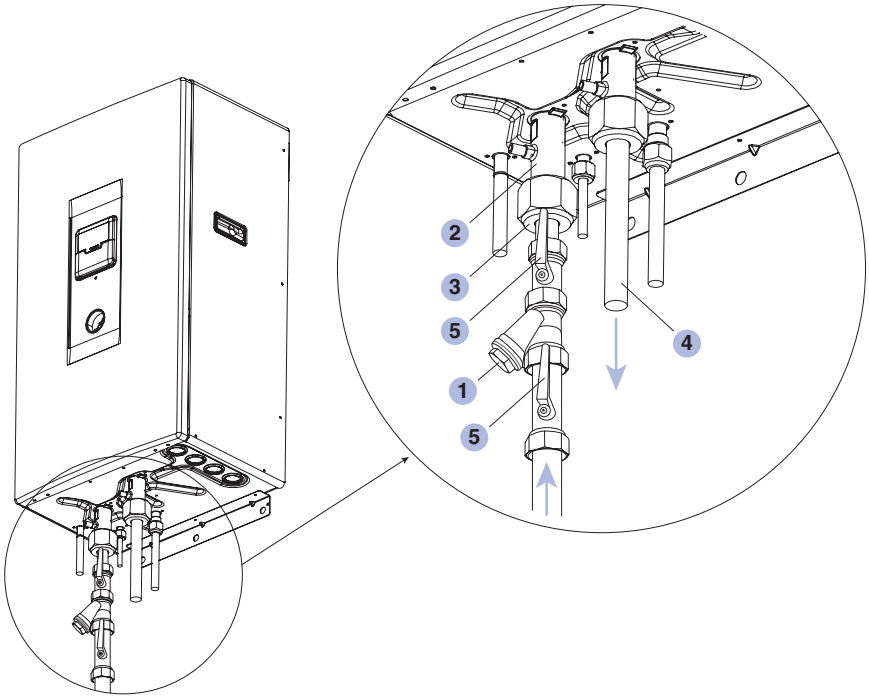
Danger!

Follow these instructions to prevent damage to the hydro module and the other components of the system:

- Flush the water-side pipelines before connecting the device, to remove impurities. Impurities can damage the components of the device.
- Ensure that the components installed in the water circuit can withstand high operating water pressures. Use only suitable sealants which can withstand the pressure and temperature of the system.
- Never use worn pipes.
- Do not use a pipe wrench to mount the connections. Use two adjustable spanners to tighten the connection.

➤ Install the pipelines, valves, and other components in accordance with the planning documents.

1. Dirt trap
2. Water inlet
3. Union nut
4. Water outlet
5. Shutoff valve



Typical water pipe installation with dirt trap

➤ Install a dirt trap (to be provided by the customer) upstream of the water inlet (water return) of the hydro module (grid width at least 500 to 600 µm) to protect the heat pump. We recommend installing a shutoff valve upstream and downstream of the dirt trap, to make subsequent maintenance work on the dirt trap easier.

⚠ Warning!
Hydraulic decoupling between the heat pump circuit and heat emitter circuit is always required when using Aquarea heat pumps with high efficiency pumps – overflow valves may not be used.

- Install an overflow valve if no hydraulic decoupling (e.g. hydraulic switch or storage tank) is planned. Ensure that the overflow valve is not designed for the minimum volume flow, but for the nominal volume flow of the respective heat pump.

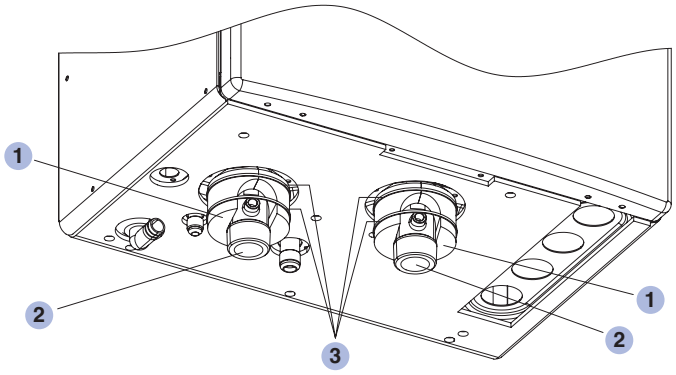
⚠ Warning!
In cooling mode, air moisture can condense on the surface of the heat transfer systems. This can damage the building or make the floor slippery. As a result, you must install suitable positioned dew point sensors to ensure that temperatures lower than the dew point do not occur or drain any condensate which forms reliably. In addition, the pipelines affected must be insulated impermeably.

- If a heat pump with a cooling function is used, install a 2-way directional valve to deactivate the heating circuits in cooling mode, where applicable.
- Install the 3-way directional valve (to be provided by the customer) to switch from heating mode to water heating mode and vice versa, if a hot-water tank by manufacturers other than Panasonic is used. As standard, the valve should be open towards the heating circuit (contacts 4 and 6 are closed). The valve must also be CE compliant and may not exceed the peak load of 12 VA.

⚠ Warning!
Tightening with too much torque can result in leaks.

- Use Rp 1¼" nuts to connect the water inlet (labelled WATER IN) and water outlet (labelled WATER OUT). Use a torque wrench to tighten it, and apply the correct torque: 117.6 Nm
- Close the supply (water outlet) and return (water inlet) of the hydro module at the heat exchanger of the hot-water tank. Make sure you do not confuse the connections.
- Install a device for draining the system on-site.

1 PS foam
2 Water connection
3 Cable ties, long



➤ Insulate the two water connections using the enclosed PS moulded parts and the long cable ties as shown in the figure.

➤ Insulate the pipes in accordance with the latest UK building regulations, although the below is recommended:

Type of pipelines	Minimum thickness of insulation layer
Internal diameter up to 22 mm	20 mm
Internal diameter from 22 mm to 35 mm	30 mm
Internal diameter from 35 mm to 100 mm	Same internal diameter

Warning!

Ensure that no impurities such as dirt or moisture can enter the pipelines. Flush the pipelines before connecting the device, to remove impurities. Impurities can damage the components of the device.

Warning!

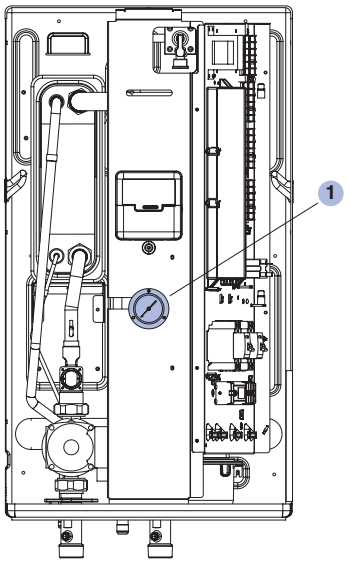
There must be at least 50 litres (for 12 to 16 kW devices) or 30 litres (for 3.0 to 9.0 kW single fan deck) of liquid in the system.
If these values are not reached, an additional storage tank must be installed.

Warning!

To prevent damage to the heat pump from lime scale, please consult BS 7593 “Code of practice for treatment of water in domestic hot water central heating systems”.

Note

The hydro modules feature an expansion tank as standard (approx. 10 litres of air capacity, initial pressure of 1 bar). The water quantity in the system should be less than 200 litres (without a hot-water tank), otherwise an expansion tank must be included. There are roughly 5 litres in the hydro module. The height difference in the water circuit should not exceed 7 metres. See the design handbook for split systems and monobloc systems for other connection variants.



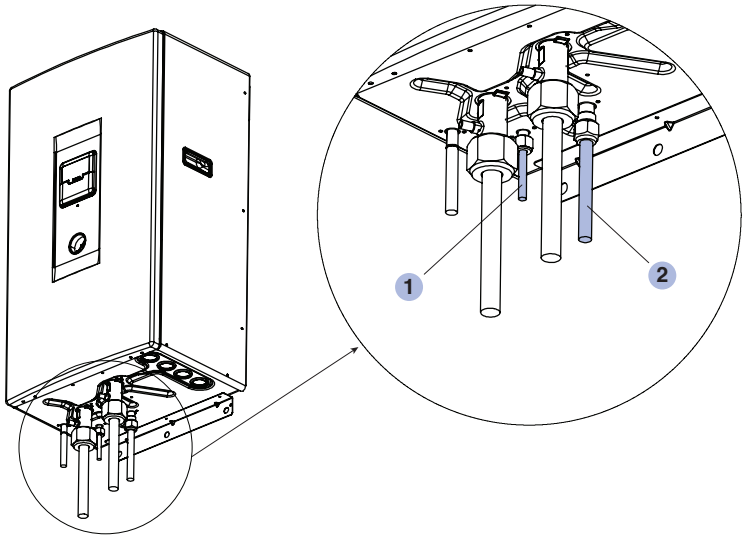
1 Manometer

- Fill the system as follows:
  - Open all thermostatic radiator valves of the heating system, and all other shutoff valves where applicable.
  - Connect a filling hose (evacuated if possible) to the system.
  - Keep adding water or antifreeze mix until the manometer reaches the nominal pressure.
- Vent the system (see the Commissioning section (9)). Then check the pressure again and add liquid if necessary

7.2 Connecting the refrigerant pipes to the hydro module

➤ Determine the pipe lengths and cut the pipes to length using a pipe cutter.
➤ Remove burrs at the cut edges.
➤ Push the union nuts into place.
➤ Bead the ends of the pipes.

1 Liquid refrigerant pipe
2 Gaseous refrigerant pipe



⚠ Warning!
Tightening with too much torque can result in leaks.

Do not use a pipe wrench to connect the refrigerant pipe. Use a suitable socket or box wrench otherwise the union nut could be damaged or the connection could leak.

➤ Centre the pipe and valve and tighten the union nut with a torque wrench and a spanner for counter-holding. Observe the correct torques:

Model		Diameter/torque	
		Gas	Liquid
SDF03E3E5 / UD03EE5 SDF05E3E5 / UD05EE5 SDC03E3E5 / UD03EE5 SDC05E3E5 / UD05EE5		ø 12.70 mm (1/2") 55 Nm	ø 6.53 mm (1/4") 18 Nm
SDC07C3E5 / UD07CE5 SDC09C3E5 / UD09CE5		ø 15.88 mm (5/8") 65 Nm	ø 6.53 mm (1/4") 18 Nm
SDC09C3E8 / UD09CE8 SDC12C9E8 / UD12CE8 SDC14C9E8 / UD14CE8 SDC16C9E8 / UD16CE8 SDC12C6E5 / UD12CE5 SDC14C6E5 / UD14CE5 SDC16C6E5 / UD16CE5 SDF09C3E8 / UD09CE8 SDF12C9E8 / UD12CE8 SDF14C9E8 / UD14CE8 SDF16C9E8 / UD16CE8 SDF12C6E5 / UD12CE5 SDF14C6E5 / UD14CE5 SDF16C6E5 / UD16CE5 SHF09D3E5 / UH09DE5 SHF12D6E5 / UH12DE5	SXC09D3E5 / UX09DE5 SXC12D6E5 / UX12DE5 SXC09D3E8 / UX09DE8 SXC12D9E8 / UX12DE8 SXF09D3E8 / UX09DE8 SXF12D9E8 / UX12DE8 SXF09D3E5 / UX09DE5 SXF12D6E5 / UX12DE5	ø 15.88 mm (5/8") 65 Nm	ø 9.52 mm (3/8") 42 Nm

➤ Lay the pipelines through the wall penetration to the outdoor unit.

7.3 Condensate outlet of the hydro module

Warning!

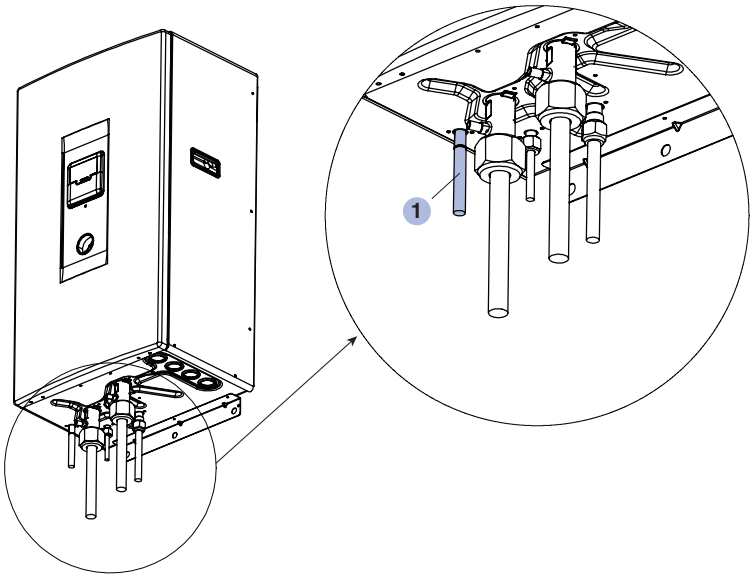
The drain hose must be in an environment which does not freeze.

Lay the drain hose so that closures or blockages cannot occur.

Do not insert the drain hose in a waste water system from which aggressive gasses such as ammonia gas, sulphur gas etc. can escape.

6.3.1 Drain hose version

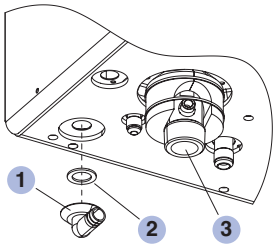
1 Water drain



➤ Push a standard hose with an internal diameter of 15 mm (to be provided by the customer) over the water drain. Ensure that the drain hose is securely in place. If necessary, secure the hose with a hose clamp (to be provided by the customer).

➤ Route the drain hose with a constant downward slope into a suitable collecting vessel for the condensate.

6.3.2 Drain bend and drain hose version



1 Drain bend
2 Seal
3 Water connection

➤ Mount the enclosed drain bend with a seal on the underside of the hydro module as shown in the figure.

➤ Push a standard hose with an internal diameter of 17 mm (to be provided by the customer) over the drain bend. Ensure that the drain hose is securely in place. If necessary, secure the hose with a hose clamp (to be provided by the customer).

➤ Route the drain hose with a constant downward slope into a suitable collecting vessel for the condensate.

7.4 Connecting the hydro module and the outdoor unit (refrigerant circuit)

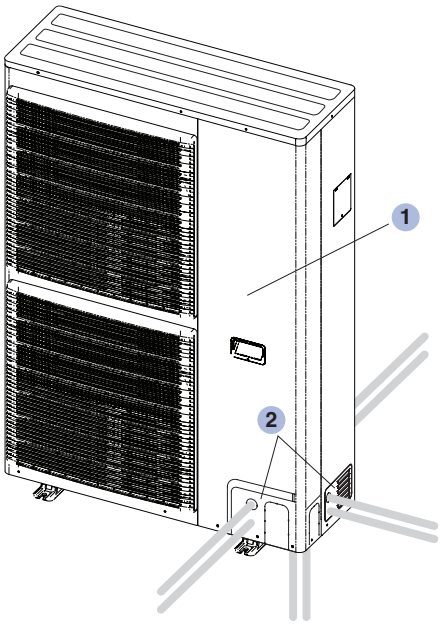
Danger!

The work may only be performed by qualified or certified personnel.

Ensure that the device is disconnected from the power supply before you perform the steps listed below.

Note

The pipelines can be connected to the device in four directions.



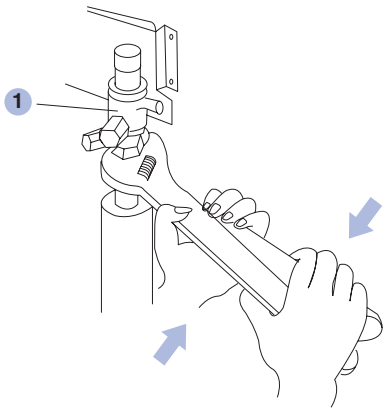
1 Panelling board
2 Pipe covers

- Open the outdoor unit as described in section 5.1.
- Remove the selected pipe cover and drill the appropriate holes for the pipelines in it.
- Mount the pipe cover again to prevent rain entering the outdoor unit.

⚠ Warning!
Tightening with too much torque can result in leaks.

Do not use a pipe wrench to connect the refrigerant pipe. Use a suitable socket or box wrench. Otherwise the union nut could be damaged or the connection could leak.

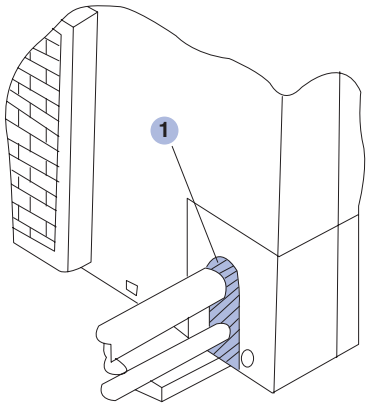
Ensure that the various pipelines are connected correctly. Do not confuse the pipelines.



1 Do **not** apply the wrench here

➤ Connect the refrigerant pipes from the hydro module to the outdoor unit as follows: Centre the pipe and valve and tighten the union nut with a torque wrench and a spanner for counter-holding. Observe the correct torques:

Model	Diameter/torque	
	Gas	Liquid
SDF03E3E5 / UD03EE5 SDF05E3E5 / UD05EE5 SDC03E3E5 / UD03EE5 SDC05E3E5 / UD05EE5	ø 12.70 mm (1/2") 55 Nm	ø 6.53 mm (1/4") 18 Nm
SDC07C3E5 / UD07CE5 SDC09C3E5 / UD09CE5	ø 15.88 mm (5/8") 65 Nm	ø 6.53 mm (1/4") 18 Nm
SDC09C3E8 / UD09CE8 SDC12C9E8 / UD12CE8 SDC14C9E8 / UD14CE8 SDC16C9E8 / UD16CE8 SDC12C6E5 / UD12CE5 SDC14C6E5 / UD14CE5 SDC16C6E5 / UD16CE5 SDF09C3E8 / UD09CE8 SDF12C9E8 / UD12CE8 SDF14C9E8 / UD14CE8 SDF16C9E8 / UD16CE8 SDF12C6E5 / UD12CE5 SDF14C6E5 / UD14CE5 SDF16C6E5 / UD16CE5 SXC09D3E5 / UX09DE5 SXC12D6E5 / UX12DE5 SXC09D3E8 / UX09DE8 SXC12D9E8 / UX12DE8 SXF09D3E8 / UX09DE8 SXF12D9E8 / UX12DE8 SXF09D3E5 / UX09DE5 SXF12D6E5 / UX12DE5 SHF09D3E5 / UH09DE5 SHF12D6E5 / UH12DE5	ø 15.88 mm (5/8") 65 Nm	ø 9.52 mm (3/8") 42 Nm



1 Thermal insulation or filler

➤ Seal the pipe inlets into the outdoor unit without gaps using thermal insulation or filler (to be provided by the customer).

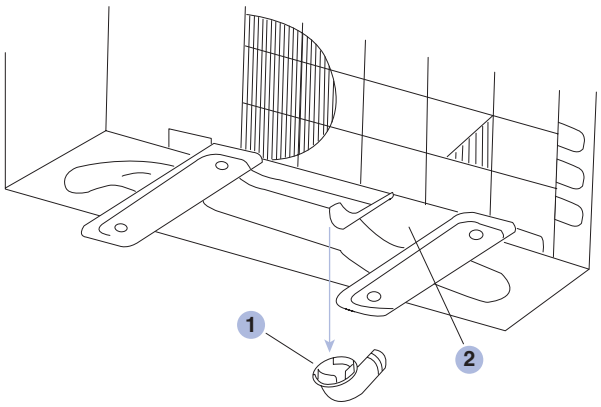
7.5 Condensate outlet of the outdoor unit

Warning!

If the outdoor unit is used in areas where the temperature can remain below zero for 2 to 3 days, the drain bend or drain hose may not be used, as the condensate could freeze and cause the device to malfunction.

Note

When using the drain bend, the outdoor unit should be mounted on a substructure at least 50 mm in height.



1 Drain bend
2 Bottom plate

- Mount the enclosed drain bend with a seal on the underside of the outdoor unit as shown in the figure.
- Push a standard hose with an internal diameter of 17 mm (to be provided by the customer) over the drain bend. Ensure that the drain hose is securely in place. If necessary, secure the hose with a hose clamp (to be provided by the customer).
- Route the drain hose with a constant downward slope into a suitable collecting vessel for the condensate.

7.6 Evacuating the refrigerant circuit

Danger!

The work may only be performed by qualified or certified personnel.

The refrigerant can cause freezing if it comes in contact with skin.

Ensure that you follow the sequence of the steps as described below, as there is otherwise a risk that gaseous refrigerant can escape.

If there is a refrigerant leak, ventilate the room and extinguish any sources of fire. If you do not do so, contact with fire can result in toxic gases.

Warning!

It is essential that you evacuate the system before commissioning.

If the refrigerant pipelines are longer than the prefilled pipe length of the device (see the table or technical data), the stated quantity of additional refrigerant must be added:

Model	Nominal length (m)	Min. pipe length (m)	Max. pipe length (m)	Prefilled pipe length (m)	Additional refrigerant fill quantity per metre (g/m)
SDF03E3E5 / UD03EE5 SDF05E3E5 / UD05EE5 SDC03E3E5 / UD03EE5 SDC05E3E5 / UD05EE5	7	3	15	10	20
SDC07C3E5 / UD07CE5 SDC09C3E5 / UD09CE5 SDF07C3E5 / UD07CE5 SDF09C3E5 / UD09CE5	7	3	30	10	30
SDC09C3E8 / UD09CE8 SDC12C9E8 / UD12CE8 SDC14C9E8 / UD14CE8 SDC16C9E8 / UD16CE8 SDC12C6E5 / UD12CE5 SDC14C6E5 / UD14CE5 SDC16C6E5 / UD16CE5 SDF09C3E8 / UD09CE8 SDF12C9E8 / UD12CE8 SDF14C9E8 / UD14CE8 SDF16C9E8 / UD16CE8 SDF12C6E5 / UD12CE5 SDF14C6E5 / UD14CE5 SDF16C6E5 / UD16CE5	7	3	40	30	50
SXC09D3E5 / UX09DE5 SXC12D6E5 / UX12DE5 SXC09D3E8 / UX09DE8 SXC12D9E8 / UX12DE8 SXF09D3E8 / UX09DE8 SXF12D9E8 / UX12DE8 SXF09D3E5 / UX09DE5 SXF12D6E5 / UX12DE5	7	3	30	15	50
SHF09D3E5 / UH09DE5 SHF12D6E5 / UH12DE5	7	3	30	15	70

Warning!

The refrigerant may not be mixed with other types of refrigerant or replaced with other types of refrigerant. Using other refrigerants can damage the device and result in safety problems.

The manufacturer accepts no liability or warranty claims if refrigerants other than the following types are used:

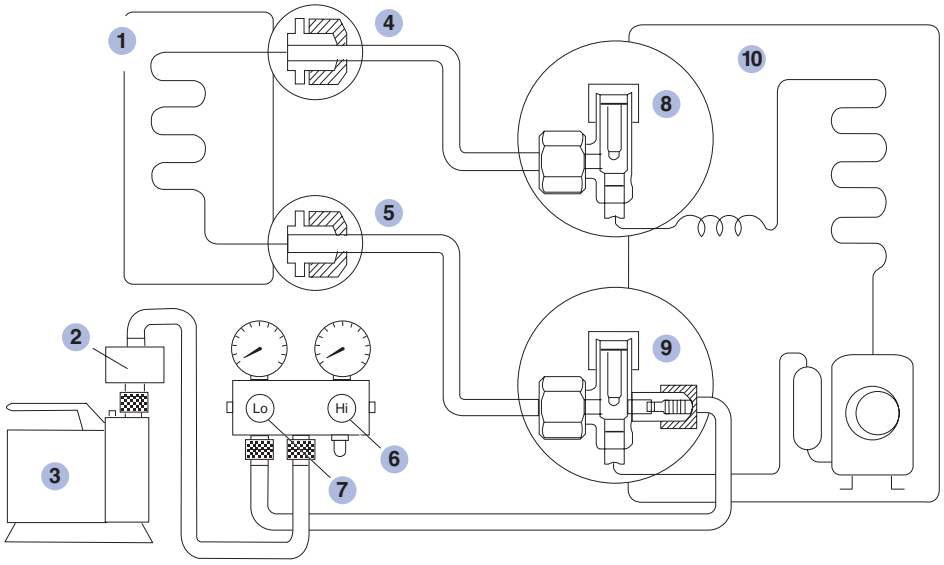
R410A for series Aquarea LT and T-CAP or

R407C for series Aquarea HT.

Warning!

When laying or relaying pipelines, no refrigerant may be released.

1. Hydro module
2. Vacuum pump adapter
3. Vacuum pump
4. Liquid pipe
5. Hot gas pipe
6. CLOSED
7. OPEN
8. 2-way directional valve, closed
9. 3-way directional valve, closed
10. Outdoor unit



- Evacuate the system as follows:
  - Connect the filling hose on the low-pressure side of the manometer station and the service connection of the 3-way directional valve. Ensure that you connect the end of the filling hose to the service connection with the pin.
  - Connect the middle hose of the manometer station to a vacuum pump with a non-return valve or a vacuum pump with an adapter.
  - Switch on the vacuum pump until the pressure has dropped to a measured value of -1 bar. Evacuate the system for roughly 30 minutes.
  - Close the valve on the low-pressure side of the manometer station and switch off the vacuum pump.
  - Observe the measured value. It should remain constant for 10 minutes. If it does not, there is a leak in the refrigerant circuit.
  - If the manometer display does not reach a constant value of -1 bar, tighten the connections. Repeat the above procedure to evacuate the system. If the measured value of -1 bar is still not reached, find and repair the leak.
  - When the manometer display shows a constant pressure of -1 bar, disconnect the hose from the vacuum pump and the service connection of the 3-way directional valve.
  - Tighten the sealing cap of the service connection of the 3-way directional valve using a torque wrench to a torque of 18 Nm.
  - Remove the valve caps of the valve spindles of the 2-way and 3-way directional valves.
  - Open the two valves using an Allen key (size 4).
  - Re-attach the valve caps of the valve spindles for the 2-way and 3-way directional valves.
  - Check the connections for leaks.

8 Electrical installation

Danger!

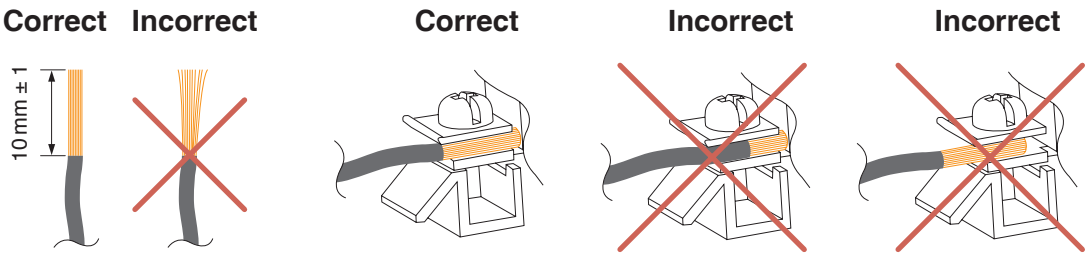
The work may only be performed by qualified or certified personnel.

Ensure that you have disconnected the power supply before you perform installation work. Secure the power supply to prevent unintentional reactivation.

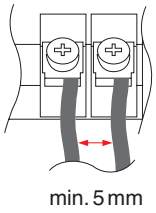
Ensure that all cables have the correct polarity. If this is not the case, electric shocks or fire can result.

Ensure that the cables can never come into contact with hot objects such as the water pipes. High temperatures can damage the insulation.

Observe the following specifications for installation:



The insulation must be at least 10 mm +/- 1 mm in length. Ensure that all strands are clamped.



The clearance between the cables must be at least 5 mm.

Clamping screw connection	Tightening torque (NM)
M4	157 – 196
M5	196 – 245

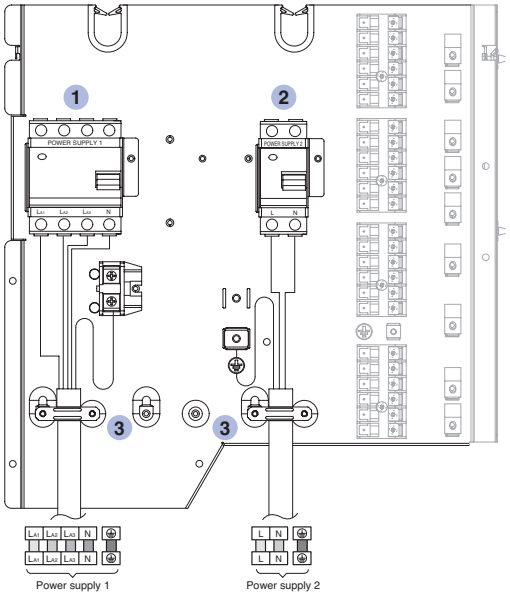
Use the following cables for electrical connection:

Component	Number of cores	Optional
Connection cable between indoor and outdoor unit	4 (6 for three-phase 400V units)	
Cable for power supply 1	3 (5 for three-phase 400V units)	
Cable for power supply 2	3	
Cable for power supply 3	3 (5 for three-phase 400V units)	
Cable for 3-way directional valve	3	×
Cable for 2-way directional valve	3	×
Cable for electric immersion heater for hot-water tank	3	×
Cable for room thermostat	4	×
Cable for temperature limit switch for hot-water tank	2	×
Cable for temperature sensor for hot-water tank	2	×
Cable for external control signal	2	×
Cable for solar 3-way directional valve	3	×
Cable for solar pump station	2	×

8.1 Mains connections

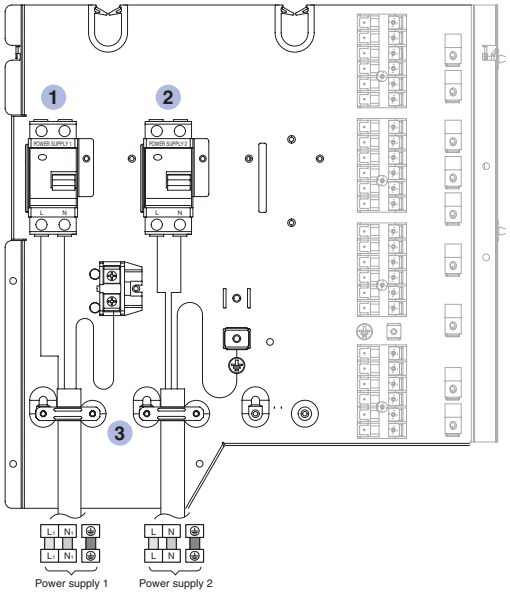
8.1.1 Monobloc systems

Mains connection for monobloc unit, 9 kW (three-phase)



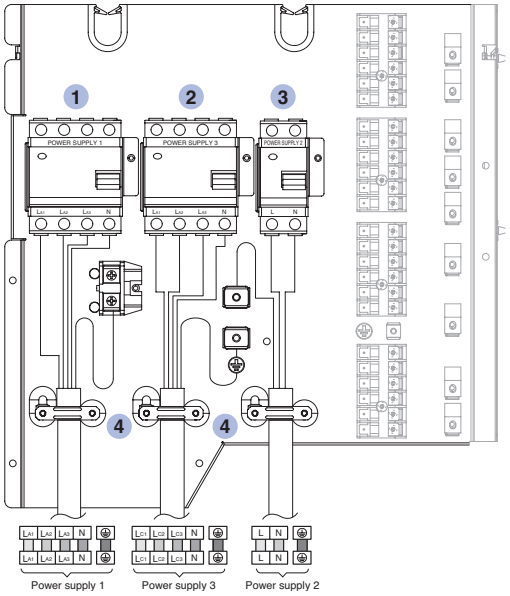
1. Monobloc unit and additional electric heater for heat pump
2. Electric immersion heater for hot-water tank
3. Strain relief

Mains connection for monobloc unit, 6 to 9 kW (single-phase)



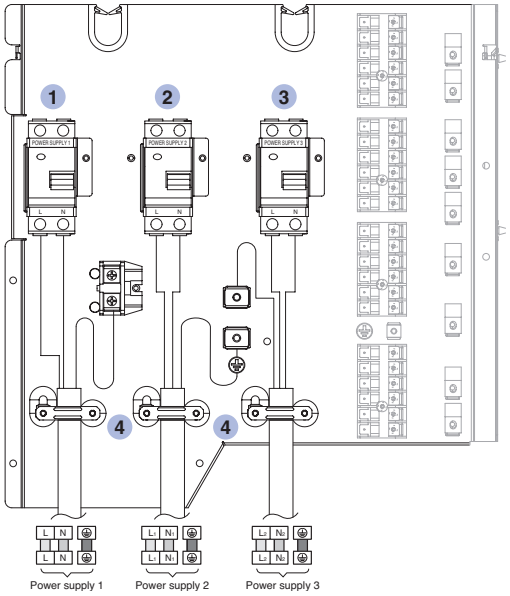
1. Monobloc unit
2. Additional electric heater for heat pump and electric immersion heater for hot-water tank
3. Strain relief

Mains connection for monobloc unit, 12 to 16 kW (three-phase)



1. Monobloc unit
2. Additional electric heater for heat pump
3. Electric immersion heater for hot-water tank
4. Strain relief

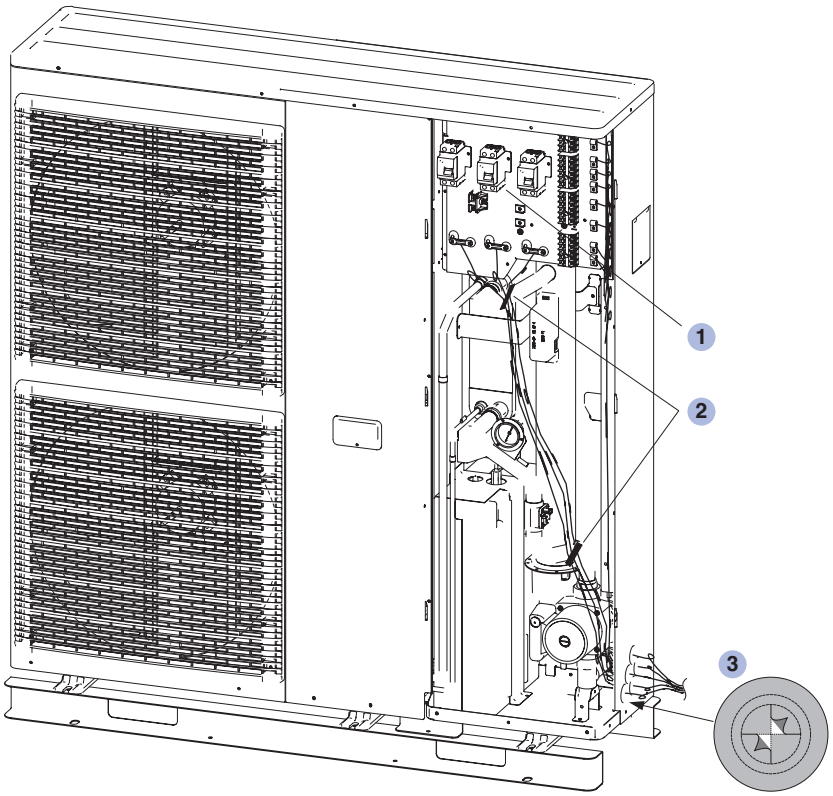
Mains connection for monobloc unit, 12 to 16 kW (single-phase)



1. Monobloc unit
2. Electric immersion heater for hot-water tank
3. Additional electric heater for heat pump
4. Strain relief

- Open the monobloc unit as described in section 5.1.
- Use cables compliant with 60245 IEC 57 or thicker for the mains connections.

1 Mains connections
2 Cable ties
3 Cable gland



Laying the cables inside the device

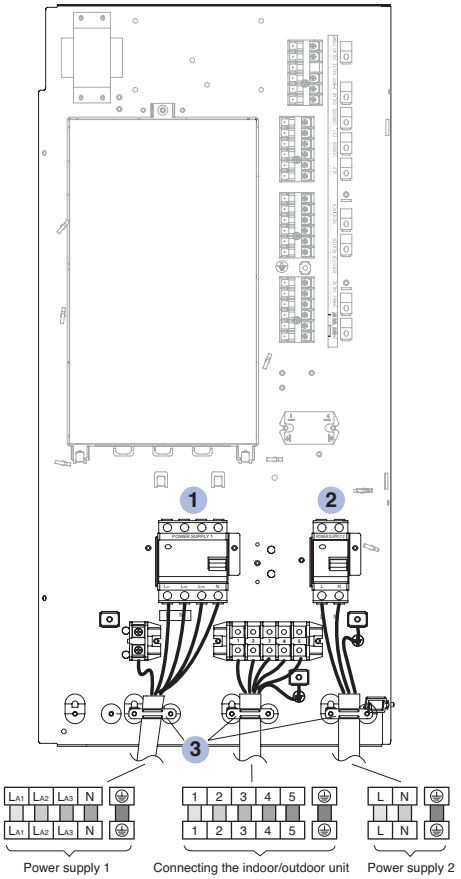
- Cut into the cable gland in a cross shape using a knife.
- Route the cables through the enclosed cable gland on the right side of the housing to prevent the cables being damaged by sharp edges.
- Connect the mains connection cable as shown in the diagrams. Ensure that the earthing cable is slightly longer than the other cables.
- Use the strain reliefs to secure the mains connection cables.
- Connect the other end of the mains connection cable to the fuses.

➤ Use the following fuses to protect the individual mains connections (isolating distance between the pins at least 3.0 mm each):

Device name	Fuse		
	Mains connection 1	Mains connection 2	Mains connection 3
WH-MDC09C3E8, WH-MDF09C3E8, WH-MXC09D3E8, WH-MXF09D3E8, WH-MHF09D3E8	20 A	16 A	–
WH-MDC12C9E8, WH-MDC14C9E8, WH-MDC16C9E8, WH-MDF12C9E8, WH-MDF14C9E8, WH-MDF16C9E8, WH-MXC12D9E8, WH-MXF12D9E8, WH-MHF12D9E8	20 A	16 A	16 A
WH-MDF06E3E5, WH-MDC09C3E5, WH-MDF09C3E5, WH-MDF09E3E5, WH-MXC09D3E5, WH-MXF09D3E5, WH-MXC12D6E5, WH-MXF12D6E5, WH-MHF09D3E5	30 A	30 A	–
WH-MDC12C6E5, WH-MDC14C6E5, WH-MDC16C6E5, WH-MDF12C6E5, WH-MDF14C6E5, WH-MDF16C6E5, WH-MHF12D6E5	30 A	30 A	16 A

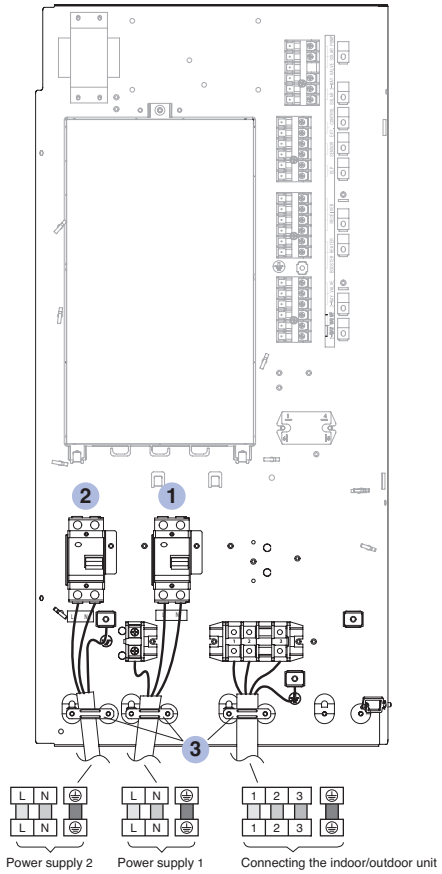
8.1.2 Split systems

Mains connection for hydro module, 9 kW (three-phase)



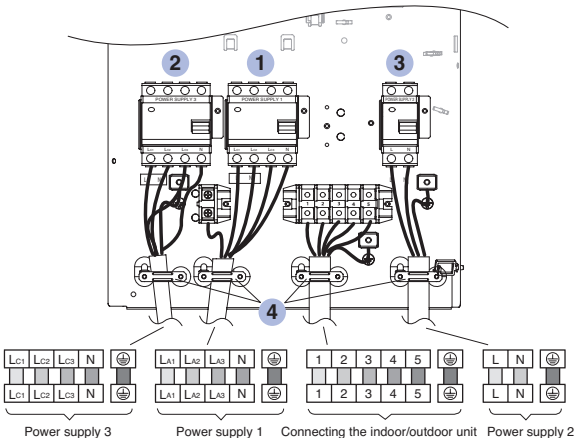
1. Hydro module, outdoor unit and additional electric heater for heat pump
2. Electric immersion heater for hot-water tank
3. Strain relief

Mains connection for hydro module, 3 to 9 kW (single-phase)



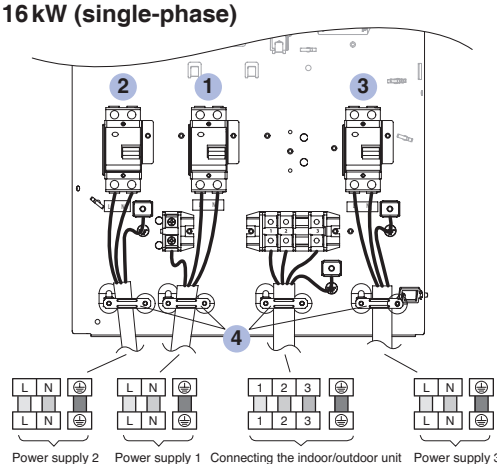
1. Hydro module and outdoor unit
2. Additional electric heater for heat pump and electric immersion heater for hot-water tank
3. Strain relief

Mains connection for hydro module, 12 to 16 kW (three-phase)



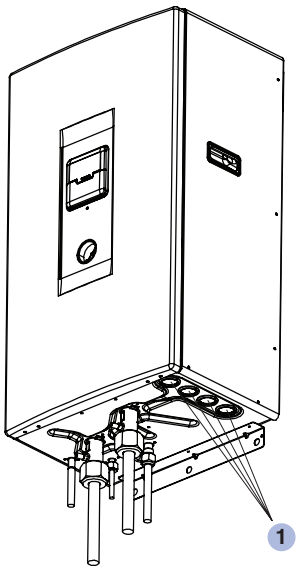
1. Hydro module and outdoor unit
2. Additional electric heater for heat pump
3. Electric immersion heater for hot-water tank
4. Strain relief

Mains connection for hydro module, 12 to 16 kW (single-phase)



1. Hydro module and outdoor unit
2. Additional electric heater for heat pump
3. Electric immersion heater for hot-water tank
4. Strain relief

⚠ Warning!
Do not remove the cable glands to prevent damage to the cables.



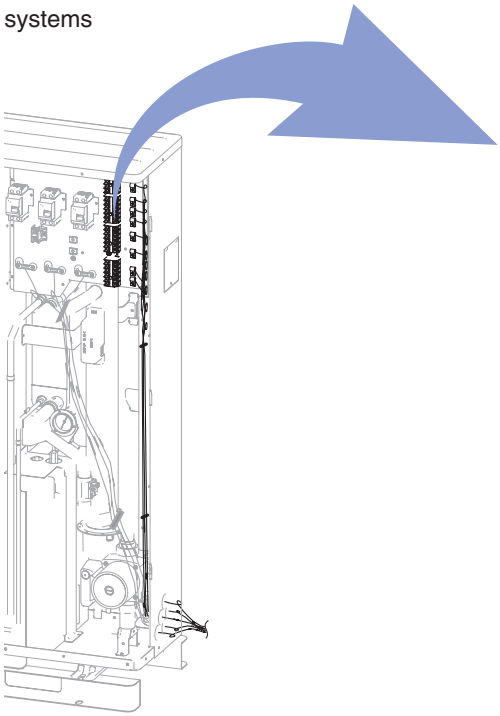
1 Cable glands

- Open the hydro module as described in section 5.2.
- Use cables compliant with 60245 IEC 57 or thicker for the mains connections.
- Pass the cables through the cable glands at the underside of the unit.
- Connect the mains connection cables as shown in the figures. Ensure that the earthing cable is slightly longer than the other cables.
- Connect the connecting cables to the outdoor unit as shown in the figures. Ensure that the earthing cable is slightly longer than the other cables.
- Use the strain reliefs to secure the mains connection cables.
- Connect the mains connection cable to the electricity mains.
- Use the following fuses to protect the individual mains connections (isolating distance between the pins at least 3.0 mm each):

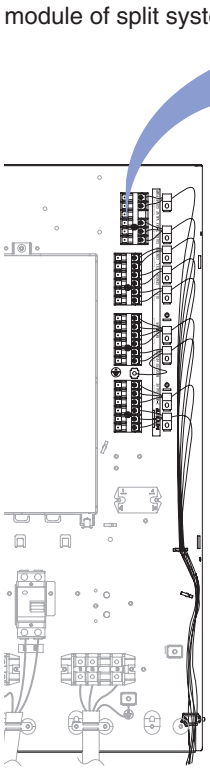
Device name	Fuse		
	Mains connection 1	Mains connection 2	Mains connection 3
SDF03E3E5, SDF05E3E5, SDC03E3E5, SDC05E3E5, SDC07C3E5, SDC09C3E5, SDF07C3E5, SDF09C3E5, SHF09D3E5, SHF09D3E8	30 A	30 A	–
SDC09C3E8, SDC12C9E8, SDC14C9E8, SDC16C9E8, SDF09C3E8, SDF12C9E8, SDF14C9E8, SDF16C9E8, SXF09D3E8, SXC09D3E8, SXF12D9E8, SXC12D9E8	20 A	16 A	16 A
SDC12C6E5, SDC14C6E5, SDC16C6E5, SDF12C6E5, SDF14C6E5, SDF16C6E5, SHF12D6E5, SHF12D9E8 SXF09D3E5, SXF12D6E5, SXC09D3E5, SXC12D6E5	30 A	30 A	16 A

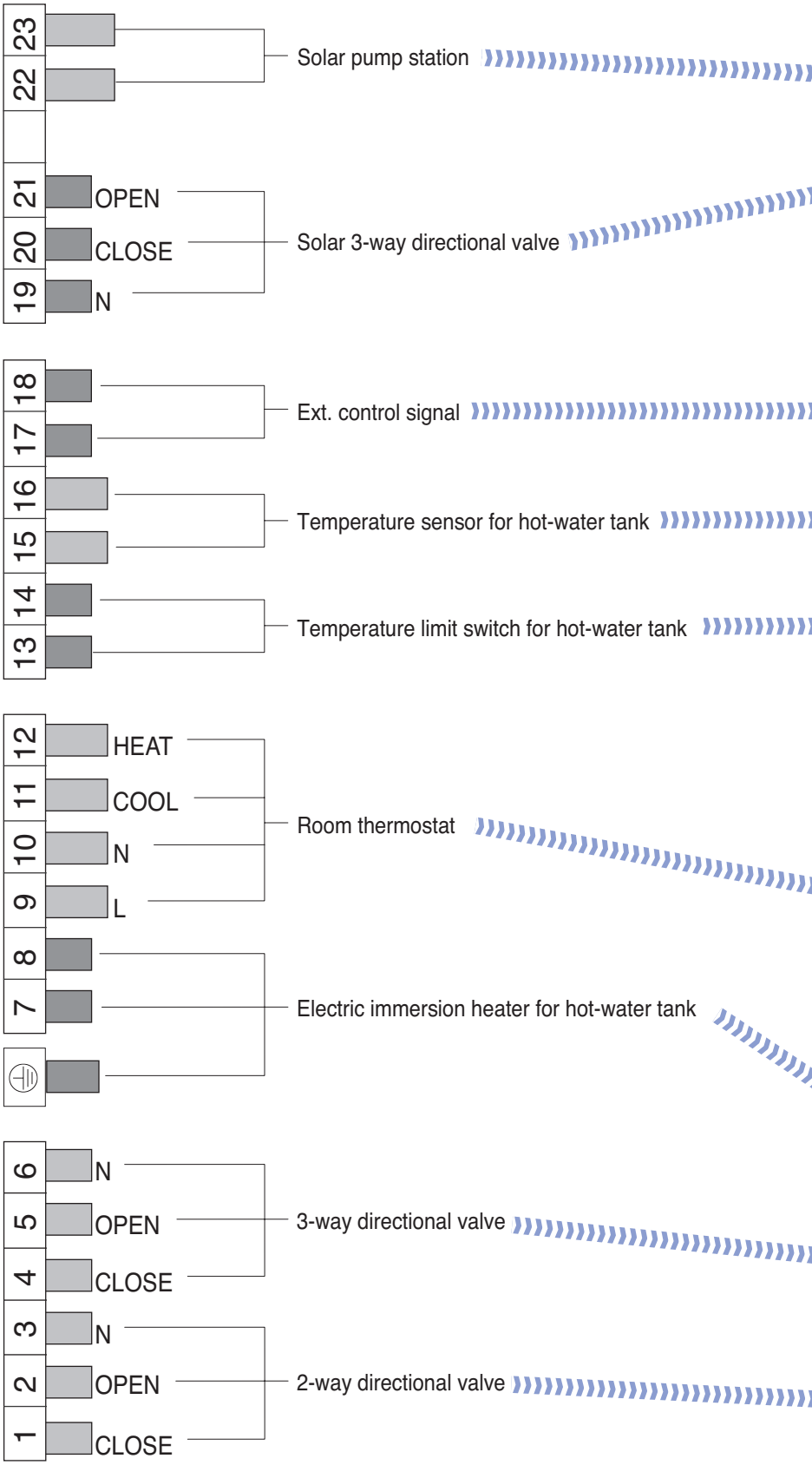
8.2 Inputs and outputs (external interfaces)

Terminal board position* on monobloc systems

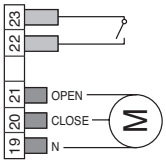
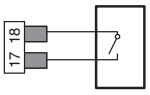
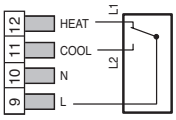
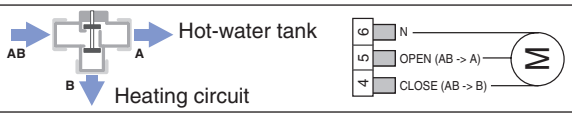
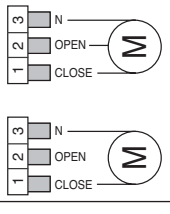


Terminal board position* on hydraulic module of split systems





* Terminal board positions are different for monobloc and split systems, while terminal layouts are the same.

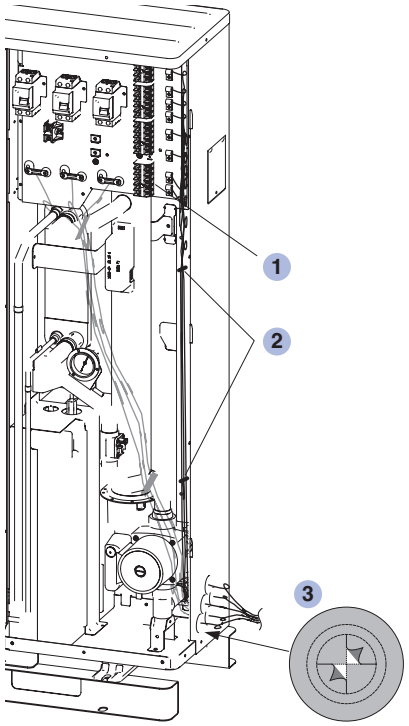
Terminals	Connection	Function	Comments	Number Cable
22 to 23	Solar pump station	Input of the ON signal from solar pump 2 (230 V AC)	Use additional circuit board CZ-NS1P, CZ-NS2P or CZ-NS3P Connect the 3-way directional valve so that it prevents flow through the solar circuit and heat exchanger of the hot-water tank when closed. 	2
19 to 21	Solar 3-way directional valve	Output for triggering the solar 3-way directional valve		3
17 to 18	Ext. control signal	Input for external control signal, volt-free, normally closed	These two terminals are jumpered on delivery. Connection: 1-pin (min. 3 mm contact clearance)  When the contacts are open, the device is switched off and the remote control is disabled. The jumper between terminal 17 and 18 must be removed, if the external control device (optional) is connected to the hydro module. The max. operating current of the control device must be less than 3 A_{ms}.	2
15 to 16	Temperature sensor for hot-water tank	Input for temperature sensor of the hot-water tank	Use an NTC sensor	2
13 to 14	Temperature limit switch for hot-water tank	Input for temperature limit switch of the hot-water tank	Terminals 13/14 must be jumpered if no temperature limit switch is used for the hot-water tank	2
9 to 12	Room thermostat	Input for external room thermostat	For exclusive control of heating mode via the external room thermostat, only phases L and L1 are connected to the terminal strip.  This also applies for devices without a cooling function. This connections do not permit switching between heating and cooling mode. **Condition** / **L/L1** / **L/L2** Room temperature > Target temperature / Circuit open (heating off) / Circuit closed (cooling on) Room temperature < Target temperature / Circuit closed (heating on) / Circuit open (cooling off) Operating mode heat pump / Heating / Cooling	4
Mass to 8	Electric immersion heater for hot-water tank	230 V output for activating/deactivating the electric immersion heater for hot-water storage tanks	The maximum output capacity of the electric immersion heater for hot-water storage tanks should not exceed 3 kW	3
4 to 6	3-way directional valve	230 V output for control of the 3-way directional valve (e.g. for heating, hot-water tank)		3
1 to 3	2-way directional valve	230 V output for controlling the 2-way directional valve (e.g. for floor heating, cooling)	Connection on automatic deactivation of heating circuits in cooling mode via a 2-way directional valve Top: Motorised 2-way directional valve Bottom: Spring-loaded 2-way directional valve, normally open 	3

Terminal strip and table of inputs and outputs with functions

8.3 Connections

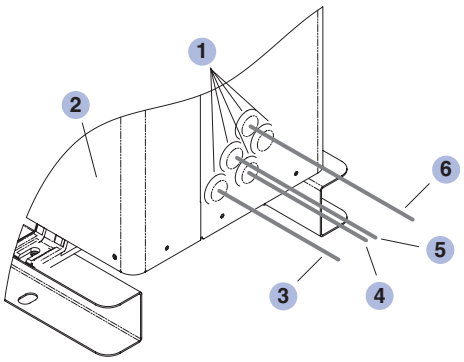
8.3.1 Monobloc systems

1. Terminal strip
2. Cable ties
3. Cable gland



Laying the cables inside the device

1. Cable gland
2. Chamber front panel
3. Power supply (3-core or 5-core for three-phase 400V monobloc units)
4. Cable for 3-way directional valve (3-core)
5. Cable for 2-way directional valve (3-core)
6. Optional cable



Laying the cable into the device

Note
The outside temperature sensor is in the monobloc unit and does not have to be installed or connected as the measurements are transferred via an internal connection.

- If necessary, open the monobloc unit as described in section 5.1.
- Cut into the cable gland in a cross shape using a knife.
- Route the cables through the enclosed cable gland on the right side of the housing to prevent the cables being damaged by sharp edges.
- Connect the cables to the terminal strips as in the above overviews. Make sure you use the correct connections.
- Secure the cable using adhesive tape and cable ties as shown in the figure. Ensure that the cables cannot come into contact with hot device parts.

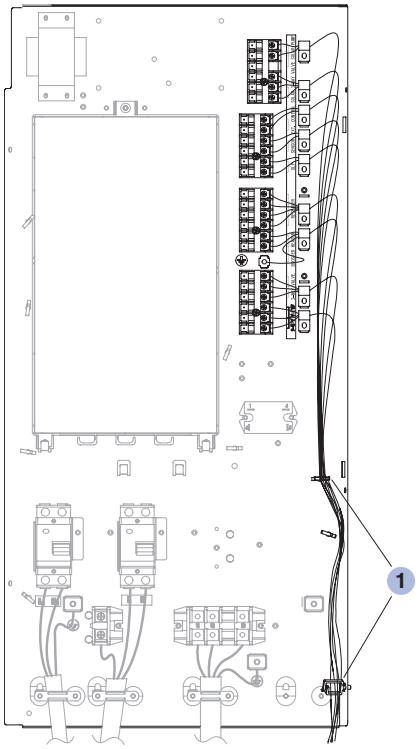
8.3.2 Split systems

⚠ Warning!
Do not remove the cable glands to prevent damage to the cables.

- If necessary, open the hydro module as described in section 5.2.
- Pass the cables through the cable glands at the underside of the unit.
- Lay the cables into the inside of the unit to the terminal strips as shown in the figure.
- Connect the cables to the terminal strips as described in the above table. Make sure you use the correct connections.

⚠ Warning!
When laying the cables, ensure that they cannot come into contact with hot device parts.

- Secure the cable using cable ties as shown in the figure.



1 Cable ties

8.3.3 Split systems: Electrical connection between hydro module and outdoor unit

Danger!

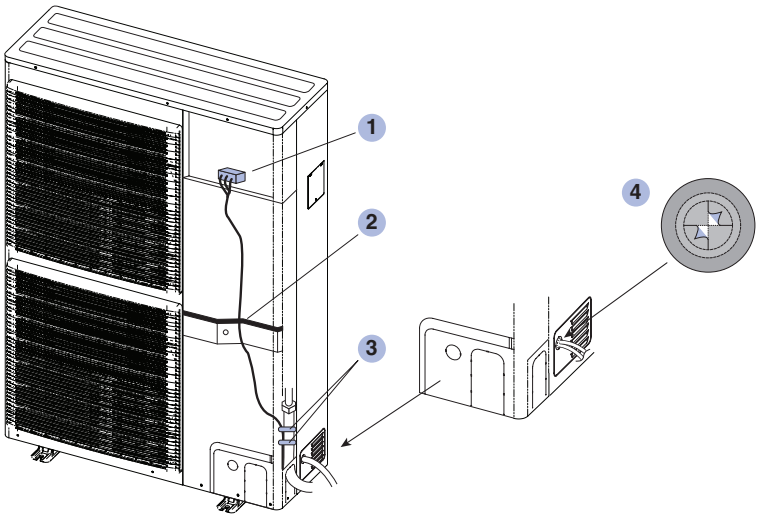
Ensure that the outdoor unit and hydro module are disconnected from the power supply before you perform the steps listed below.

- ➤ Lay the connection cables through the wall penetration from the hydro module to the outdoor unit.
- ➤ Open the outdoor unit as described in section 5.1.

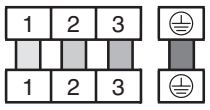
1. Terminal strips
2. Cable clamp
3. Cable ties
4. Cable gland

Note

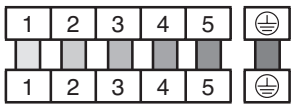
There are three possible positions for the cable gland.



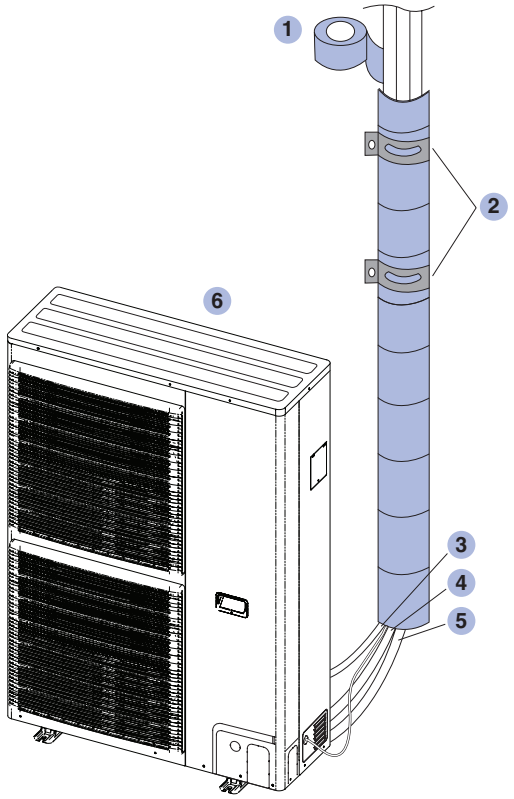
- ➤ Cut into the cable gland in a cross shape using a knife.
- ➤ Route the cables through the enclosed cable gland to prevent the cables being damaged by sharp edges.
- ➤ Secure the cable using the cable clamp and ties as shown in the figure. Ensure that the cables cannot come into contact with hot device parts.
- ➤ Connect the cables to the terminal strip.
  Make sure you use the correct connections.
- ➤ Connect the outdoor unit as described in section 5.1.



Single-phase mains connection



Three-phase mains connection



1. Cable tape or cable duct
2. Clamp
3. Connection cable between hydro module and outdoor unit
4. Liquid refrigerant pipe
5. Gaseous refrigerant pipe
6. Outdoor unit

➤ Wrap cable tape around the pipes and cables as shown in the figure and secure using clamps if necessary.
Alternatively, you can lay the pipelines and cables in a cable duct.

➤ After laying all pipes and cables, seal the wall penetration into the building with suitable sealant (to be provided by the customer).

8.4 Installing the wired remote control for monobloc systems

Warning!

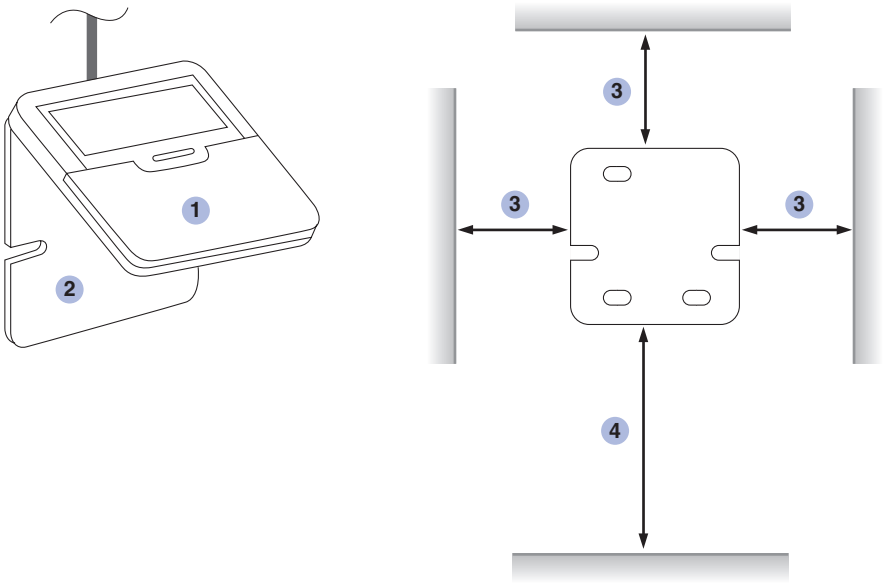
Please follow these instructions to prevent damage and problems:

- Do not change the length of the cable for the wired remote control.
- Install the wired remote control cable at least 5 cm away from other electric cables.
- Do not install the wired remote control cable in the immediate vicinity of water or condensate pipes.
- The installation location must be dry.
- The wired remote control must be installed so that it is not exposed to direct sunlight.
- Mount the wired remote control in as level a location as possible to prevent the wired remote control bending.
- Observe the minimum clearances as shown in the following diagram:

Component	Quantity	Comment
Remote control	1	
Remote control cable	1	15 m long
Screw (M4 × 30 mm machine screw)	3	For installing the remote control on an outlet (embedded connection cable)
Screw (M4 × 14 mm self-tapping screw)	3	Installing the remote control on the wall (exterior connection cable)

Included accessories

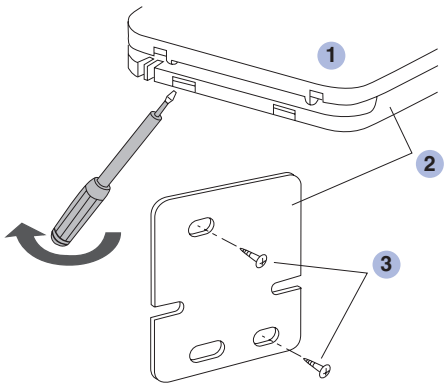
1 Upper cover
2 Lower cover
3 Clearance 30 mm
4 Clearance 120 mm



Minimum clearances to be observed for the wired remote control

➤ If necessary, open the monobloc unit as described in section 5.1.

1 Upper cover
2 Lower cover
3 Screw, M4×30 or M4×14



Opening the wired remote control

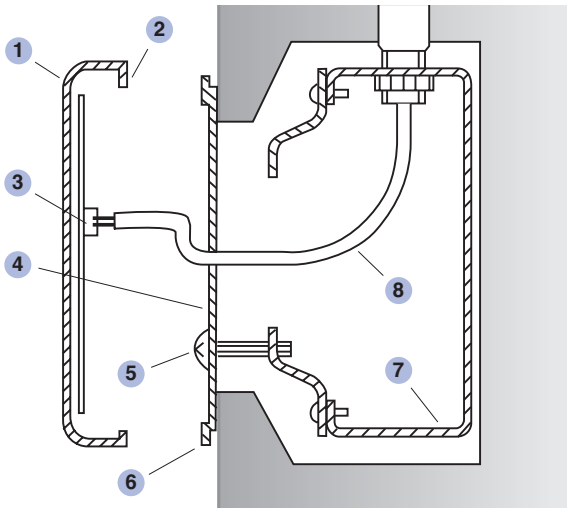
➤ Remove the lower cover of the wired remote control by placing a flat-head screwdriver or similar tool in the lower slots and carefully levering the upper and lower covers apart. Ensure that you don't damage the housing.

➤ Remove the lower cover. Ensure that the protective tape between the circuit board and the upper cover is not removed.

You can lay the wired remote control cable so that it is concealed or visible:

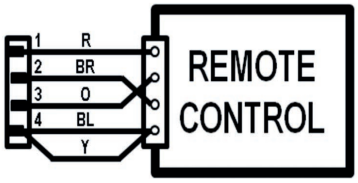
8.4.1 Laying concealed cables

1 Upper cover
2 Upper clamp
3 Plug connector (CON1)
4 Lower cover
5 Screw
6 Lower clamp
7 Flush-mounted box
8 Remote control cable

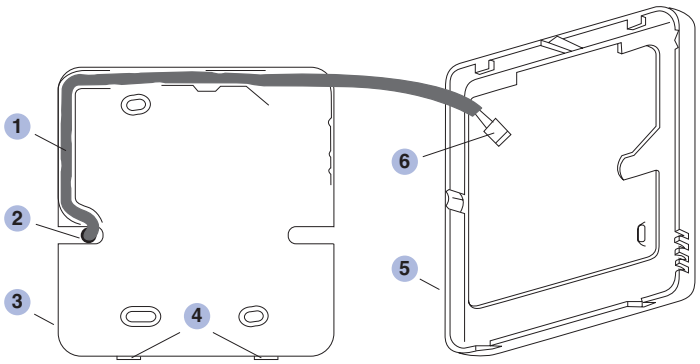


Laying concealed cables

⚠ Warning!
If plugs are removed during installation, the wiring is twisted on 2 and 3:



1 Upper cover
2 Cable outlet to the rear
3 Lower cover
4 Tabs
5 Upper cover
6 Cable connection (CON1)



Laying cables in the wired remote control

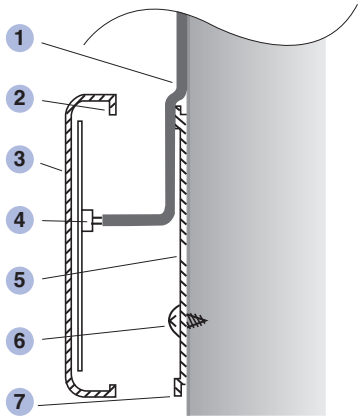
⚠ Danger!
Lay the cable as shown in the figure above so that the housing of the wired remote control can be closed securely.

⚠ Warning!
In cavity walls, use a bushing for the wired remote control cable to prevent rodents biting the wire.

- ➤ Insert a flush-mounted box (to be provided by the customer) into the wall (medium-sized rectangular socket, **Panasonic** part no. DS3744 or similar).
- ➤ Insert the wired remote control cable into the socket.
- ➤ Route the concealed wired remote control cable to the wired remote control as shown in the figure.
- ➤ Use the two supplied M4×30 screws to fasten the lower cover of the remote control to the flush-mounted socket. Ensure that the lower cover is not under strain and do not tighten the screws excessively. Use only the supplied screws.
- ➤ Fasten the connection of the remote control cable to the plug connector (CON1) in the upper cover of the circuit board. Ensure that is securely attached.
- ➤ Secure the upper cover to the lower cover of the remote control using the clamps provided.

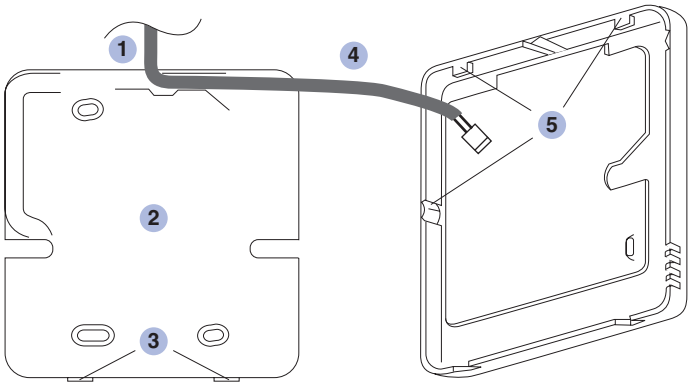
8.4.2 Laying visible cables

1. Remote control cable
2. Upper clamp
3. Upper cover
4. Plug connector (CON1)
5. Lower cover
6. Screw
7. Lower clamp



Laying visible cables

1. Cable outlet to the top
2. Lower cover
3. Tabs
4. Remote control cable
5. Notches



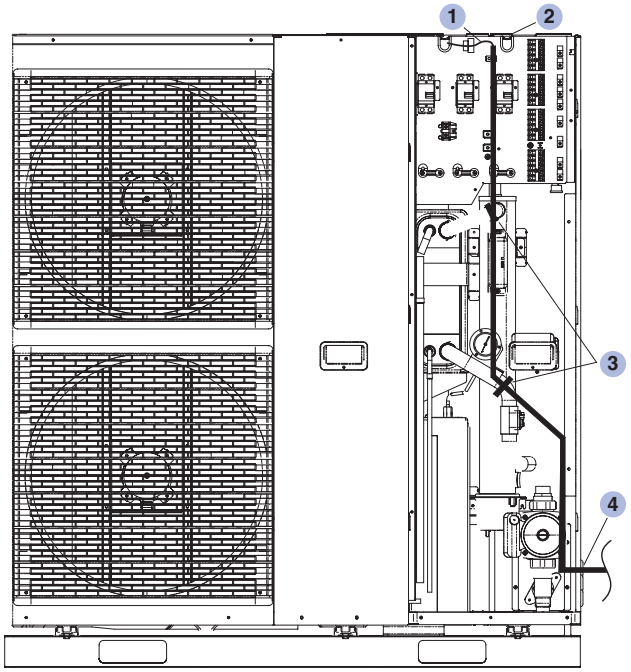
⚠ Danger!
Lay the cable as shown in the figure above so that the housing of the remote control can be closed securely.

- Use the two supplied M4×14 screws to secure the lower cover of the remote control to the wall. When tightening the screws, ensure that the screw heads not sitting proud. Use only the supplied screws.
- Select an outlet direction of your choice for the remote control cable and use a wire cutter to open one of the notches provided for this purpose in the upper cover in accordance with the outlet direction.
- Route the remote control cable in the lower cover as shown in the figure based on the outlet direction selected.
- Fasten the connection of the remote control cable to the plug connector (CON1) in the upper cover of the circuit board. Ensure that is securely attached.
- Secure the cover to the lower cover of the remote control using the clamps provided.

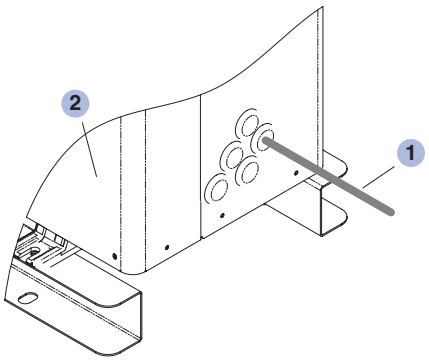
8.4.3 Connection to the monobloc unit

➤ If necessary, open the monobloc unit as described in section 5.1.

1. Remote control cable
2. CNREMOTE2 connection
3. Cable ties
4. Cable gland



1. Remote control cable
2. Chamber front panel



Laying the cable into the device

➤ Cut into the cable gland in a cross shape using a knife.

➤ Route the cables through the enclosed cable gland on the right side of the housing to prevent the cables being damaged by sharp edges.

➤ Remove the dummy connection from the CN-REMOTE2 connection.

➤ Connect the wired remote control cable to the CN-REMOTE2 connection. Ensure it is attached securely.

➤ Secure the cable using cable ties as shown in the figure. Ensure that the cables cannot come into contact with hot device parts.

9 Commissioning

9.1 Preparing monobloc systems for commissioning

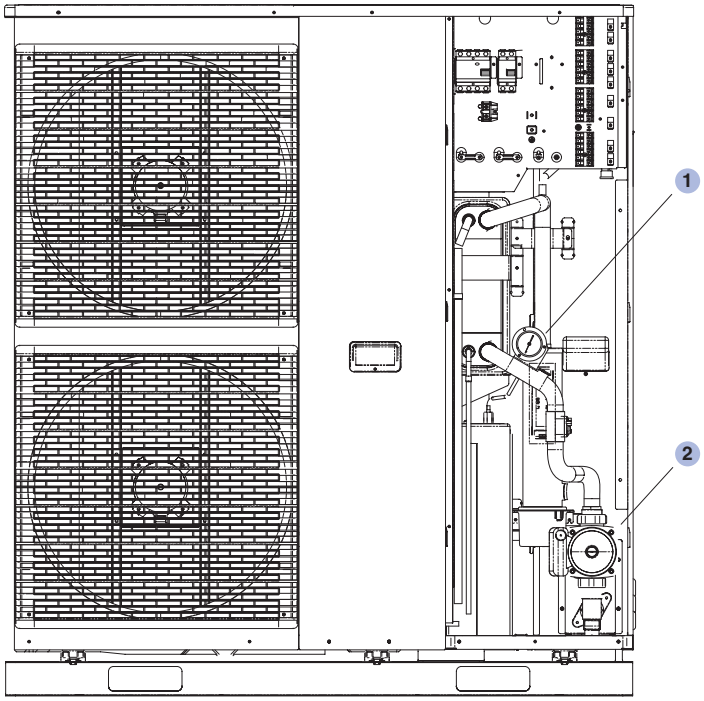
Danger!

Only qualified or certified personnel may work on the open device.
The device carries potentially fatal voltage when open.
Ensure that you do not touch any live device parts.

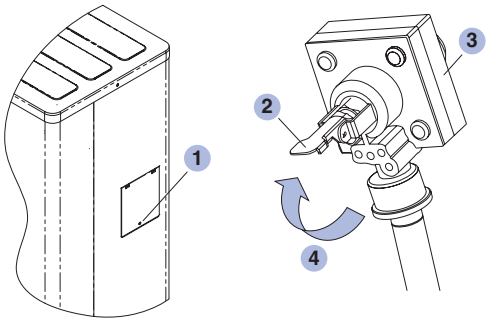
Warning!

System must be powered up (Power supply 1) 5 hours prior to running the heat pump to prevent long-term irreversible compressor damage.

1. Manometer
2. Water recirculation pump (Figure shows standard pump)



1 Fastening screws
2 Lever
3 Pressure relief valve
4 Raise lever



Pressure relief valve

- Open the monobloc unit as described in section 5.1.
- Vent the heating system. Proceed as follows to do so:
  - Loosen the fastening screws as shown in the figure and remove the cover.
  - Set the lever of the pressure relief valve to the horizontal position (open). The enclosed air can now escape.
  - Return the lever of the pressure relief valve to the basic setting (closed) after a few seconds.
  - Repeat the process until you can no longer hear air bubbles moving.
  - Check the system pressure on the manometer. In normal operation, the system pressure should be between 0.5 bar and 3 bar. If necessary, set the target pressure.
- Check the refrigeration circuit in the monobloc unit for leaks. Any leaks must be repaired.
- Perform a test run to ensure that no malfunctions occur after installation. Proceed as follows to do so:
  - Switch the RCD to ON.
  - Switch on the monobloc unit (OFF/ON button) on the operator control panel or wired remote control). See sections 9.3 ... 9.5 for operation and programming.
  - Check the system pressure on the manometer again. In normal operation, the system pressure should be between 0.5 bar and 3 bar. If necessary, set the target pressure.
- Set the water circulation pump. Please note that settings differ for standard pumps and high efficiency pumps, as described in the two relevant sub-sections 9.3.1 and 9.3.2.

Indication
Devices with high efficiency pumps are identified separately in the overview on page 5.

9.2 Preparing split systems for commissioning

Danger!

Only qualified or certified personnel may work on the open device.
The device carries potentially fatal voltage when open.

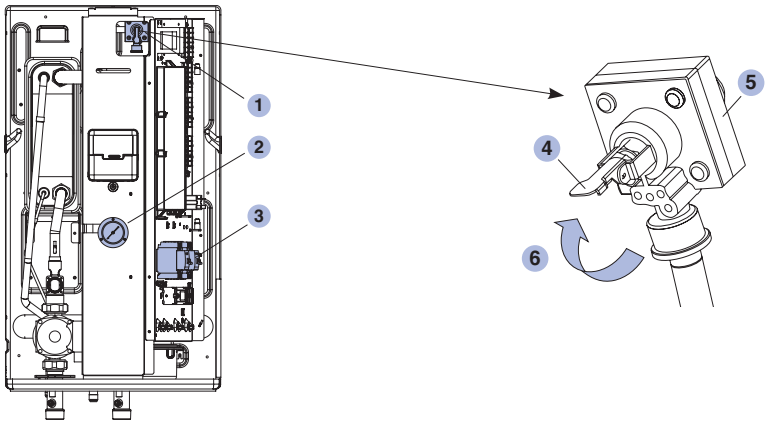
Warning!

System must be powered up (Power supply 1) 5 hours prior to running the heat pump to prevent long-term irreversible compressor damage.

Warning!

The refrigerant system absolutely must be evacuated before initial commissioning, see section 7.6.

1. Pressure relief valve
2. Manometer
3. RCD
4. Lever
5. Pressure relief valve
6. Raise lever

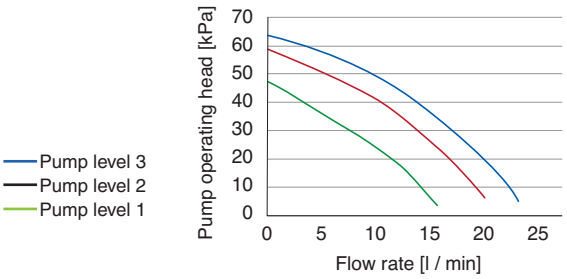


- ➤ Open the hydro module as described in section 5.2 and the outdoor unit as described in section 5.1.
- ➤ Vent the heating system. Proceed as follows to do so:
  - ➤ Set the lever of the pressure relief valve to the horizontal position (open). The enclosed air can now escape.
  - ➤ Return the lever of the pressure relief valve to the basic setting (closed) after a few seconds.
  - ➤ Repeat the process until you can no longer hear air bubbles moving.
  - ➤ Check the system pressure on the manometer. In normal operation, the system pressure should be between 0.5 bar and 3 bar. If necessary, set the target pressure.

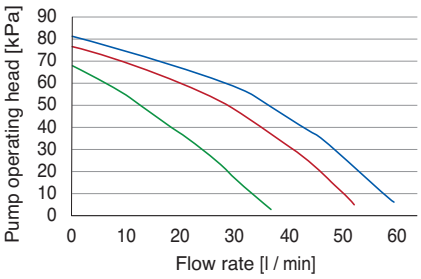
- Open the shutoff valves on the outdoor unit.
- Check the refrigeration circuit in the hydro module and outdoor unit for leaks. Repair any leaks as required.
- Perform a test run to ensure that no malfunctions occur after installation. Proceed as follows to do so:
  - Set all RCDs to ON.
  - Switch on the hydro module (OFF/ON button) on the operator control panel). See sections 9.3 ... 9.5 for operation and programming.
  - Check the system pressure on the manometer again. In normal operation, the system pressure should be between 0.5 bar and 3 bar. If necessary, set the target pressure.

9.3 Setting up the water pump

9.3.1 Setting the standard pump



Characteristic curve of the standard circulation pump for the Aquarea heat pump 7 and 9 kW, single-phase



Characteristic curve of the standard circulation pump of the Aquarea heat pumps 9 kW (three phase) and 12, 14 and 16 kW single and three-phase.

⚠ Warning!
Ensure that the minimum flow rate does not fall below 10 l/min for the Mini monobloc or 19 l/min for the other monobloc units.

⚠ Warning!
Ensure that the minimum flow rate for split systems does not fall below
5 l/min (up to and including 5 kW)
10 l/min (up to and including 9 kW single fan decks)
19 l/min (over 9 kW).

- The circulation pump offers three speed levels. If necessary, set the circulation pump to a higher speed level (e.g. if the flow rate is too low) or a slower speed level (e.g. to decrease noise). If setting the speed of the circulation pump does not solve the problem, contact an authorised dealer.
- After the test run, clean the dirt trap.

9.3.2 Setting the high efficiency pump

⚠ Warning!
Hydraulic decoupling between the heat pump circuit and heat consumer circuit is always required when using Aquarea heat pumps with high efficiency pumps – overflow valves may not be used. If hydraulic decoupling is not implemented, the flow could fall below the minimum volume flow, which results in error messages on the heat pump. See also the instructions in the design handbook.

The high efficiency pumps in Aquarea heat pumps have two control types which can be set on the pump.

⊢ Δ p-c – constant differential pressure:

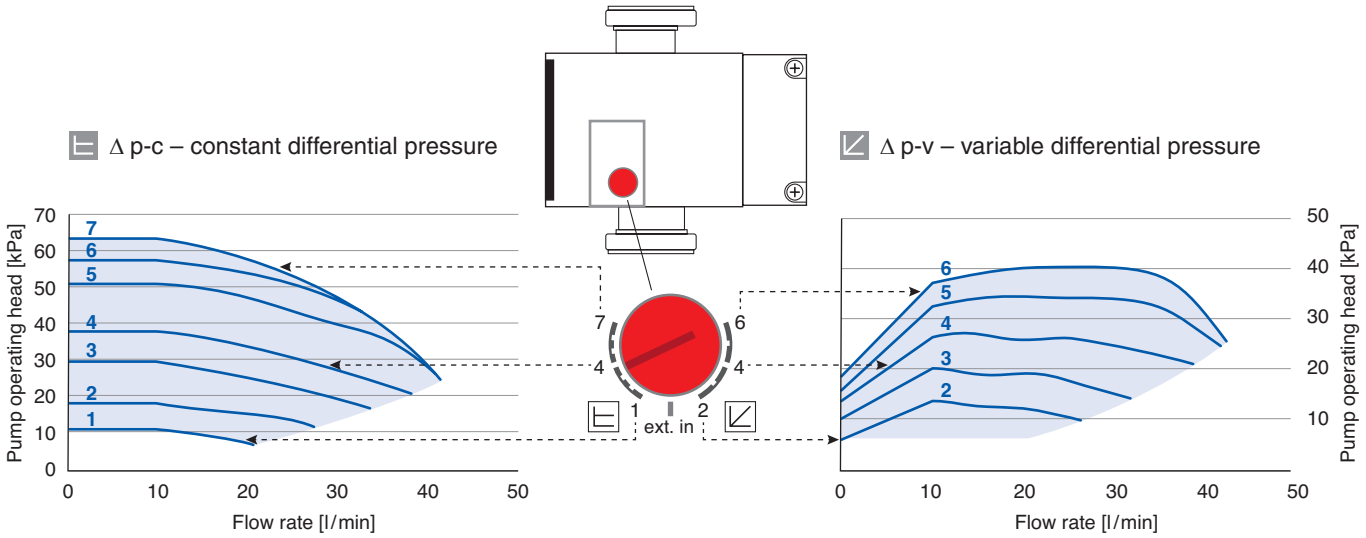
The electronic system **holds** the differential pressure target to be maintained by the pump at the value set (level 1 to 7) as per the curve below.

⌟ Δ p-v – variable differential pressure:

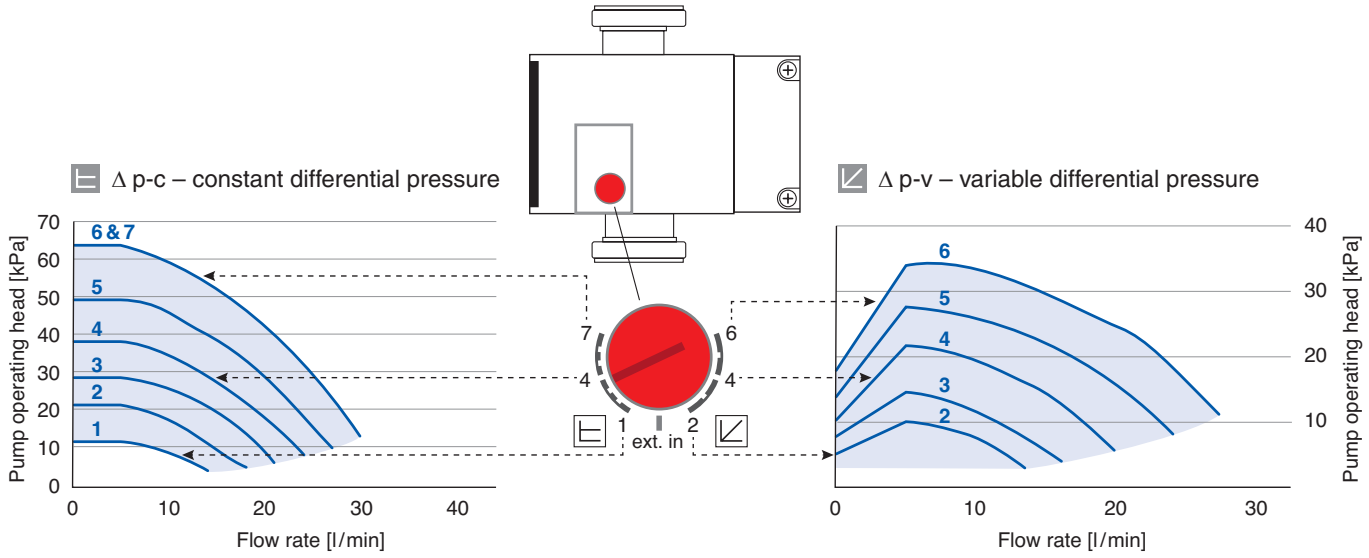
The electronic system **changes** the differential pressure target to be maintained by the pump (configurable between levels 2 to 6), whereby the differential pressure decreases simultaneously with the volume flow to max. half of the differential pressure target.

ⓘ Note
As standard, the high efficiency pump is preset to control type Δ p-c, level 4. Panasonic recommends control type Δ p-c.

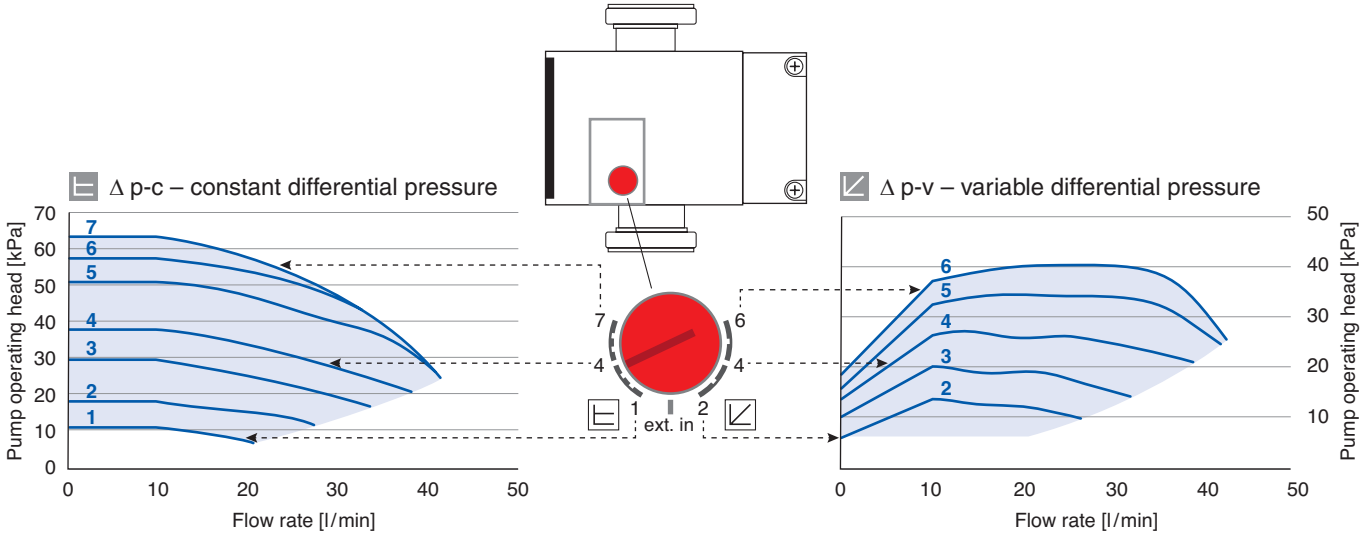
Set the pump level of the high efficiency pump by turning the red adjusting knob to ensure that the minimum volume flow is present.



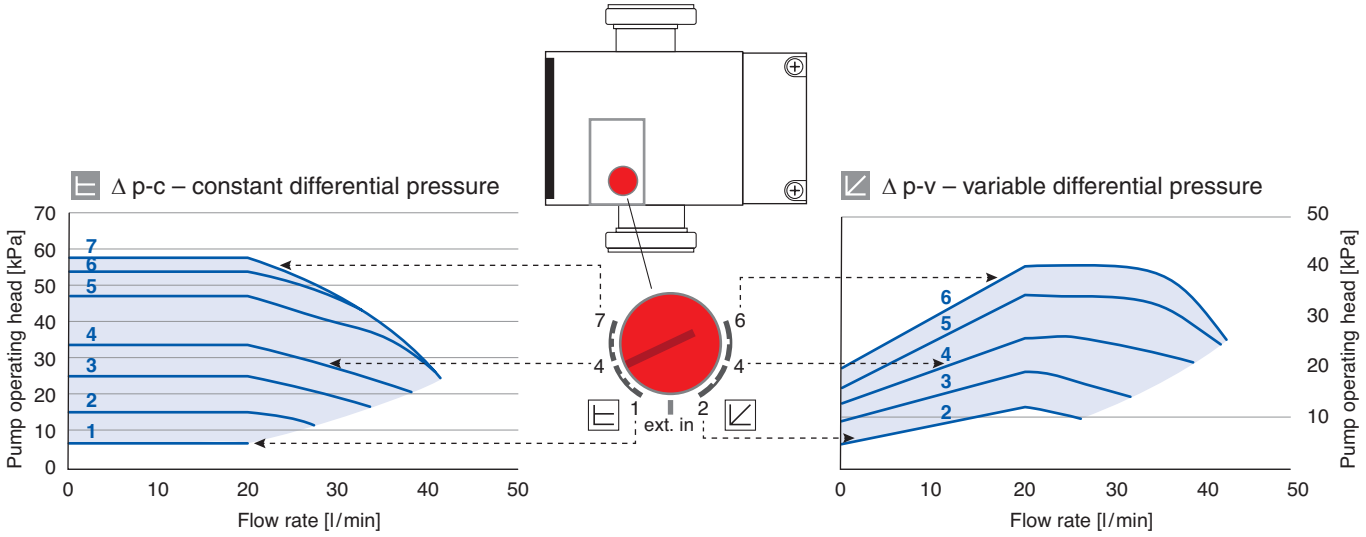
Pump characteristic curve of the high efficiency water circulation pump for the Aquarea Mini monobloc devices WH-MDF06E3E5 and WH-MDF09E3E5



Pump characteristic curve of the high efficiency water circulation pump for the Aquarea 3 and 5 kW hydro modules



Pump characteristic curve of the high efficiency water circulation pump for the Aquarea 9 kW hydro module



Pump characteristic curve of the high efficiency water circulation pump for the Aquarea 12 kW hydro module

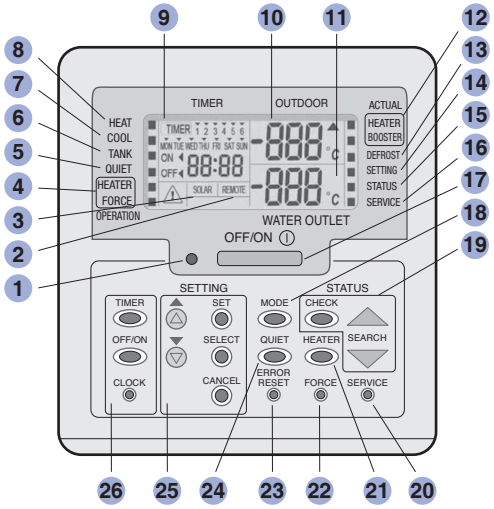
- If necessary, set the water recirculation pump to a higher speed level (e.g. if the flow rate is too low) or a slower speed level (e.g. to decrease noise). If setting the speed of the water recirculation pump does not solve the problem, contact an authorised dealer.
- After the test run, clean the dirt trap.

9.4 Handover and instruction

- Complete the commissioning report (see Appendix). Check again that all installation work has been performed completely and correctly.
- Pass all documents to the end customer and instruct them to store the documents in a safe place. Explain to them how to operate the unit and sign the handover report and acceptance certificate (see Appendix) together with the customer.

9.5 Programming

Note
As the same operator control panel is used for different devices, some functions may not apply for your device.



Displays

1. Operation LED
2. Display of external room thermostat
3. Display of solar installation
4. Display of operation of additional electric heater for heat pump and emergency heating mode (ON/OFF)
5. Display for quiet mode (ON/OFF)
6. Hot-water tank operation display (ON/OFF)
7. Cooling operation display (ON/OFF) (The operator control panel of the SDF models has no display for cooling mode)
8. Heating operation display (ON/OFF)
9. Display of timer setting and time
10. Display of outside temperature
11. Display of water outlet temperature
12. Display of additional electric heater for the heat pump and the electric immersion heater for the hot-water tank (ON/OFF)
13. Display for defrosting (ON/OFF)
14. Display for system programming (ON/OFF)
15. Display for system status (ON/OFF)
16. Display for service (ON/OFF)

Button assignment

17 Operation button (ON/OFF)

18 Operating mode selection button
Use this button to select the operating mode required.

19 System status buttons
These buttons are used for a series of status queries. Proceed as follows:

➤ Press the CHECK button for 5 seconds to switch to Status mode.

➤ Press the UP or DOWN button to open the following values:
1. Compressor operating frequency
2. Error code
3. Water inlet temperature
4. Water tank temperature

➤ Press the CANCEL button or wait 30 seconds to quit Status mode.

20 Service button
This button takes you to menu items Sr:01 for pump down mode and Sr:02 for circulation pump. You can toggle between the two menu items using the SEARCH arrow buttons.

21 Button for enabling the additional electric heater for the heat pump. The additional electric heater can only be user if this button is pushed. Note: If this button is not pressed, the additional electric heater for the heat pump is only used for:
- Defrosting
- Device startup
- Frost protection mode

22 Emergency heating mode button
This button allows the device to be operated in emergency heating mode with the additional electric heater for the heat pump, e.g. if the heat pump is defective. Press the ON/OFF button to switch off emergency heating mode.

23 Error reset button

24 Quiet mode button

25 System programming buttons
These buttons are used to set temperature values.

26 Timer programming buttons
These buttons are used to set the time and the weekly timer.

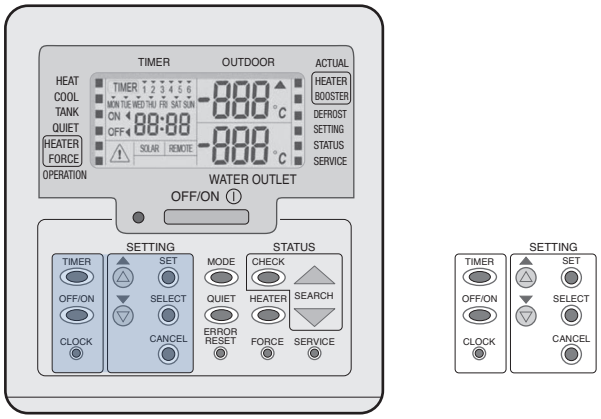
Setting the weekday and time

Note

The current weekday and time must be set when:

- the power supply is switched on for the first time,
- a long interruption to the power supply.

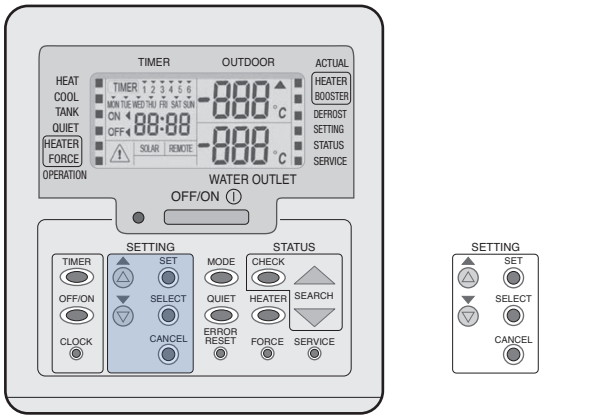
The current time set is the time basis for all timer functions.



➤ Set the weekday and time as follows:

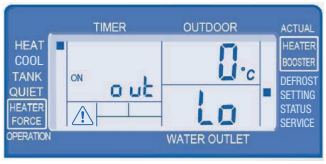
- ➤ Press the CLOCK button.
- ➤ Press the UP or DOWN button to set the current weekday.
- ➤ Press the SET button to confirm the setting.
- ➤ Repeat steps 2 and 3 to enter the current time.

Setting the temperature values



➤ Set the temperature values as follows:

- ➤ Press the SET button for 5 seconds to switch to Setting mode.
- ➤ Press the UP or DOWN buttons to access the following 8 temperature parameters.



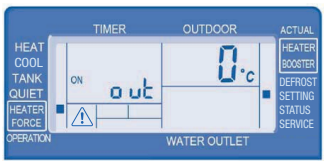
1. Low outside temperature (-15 to +15 °C, Std. 0 °C)

2. High outside temperature (-15 to +15 °C, Std. 15 °C)

3. Water supply target temperature for heating mode at low outside temperature (25 to 55 °C, Std. 55 °C)

4. Water supply target temperature for heating mode at high outside temperature (25 to 55 °C, Std. 32 °C)

5. Target temperature for switching off heating mode (limit heating temperature, 5 to 35 °C, Std. 24 °C)



6. Outside temperature for switching on the additional electric heater (-15 to +20 °C, Std. 0 °C)

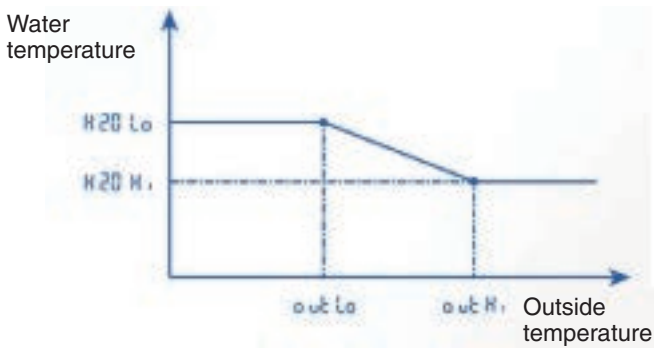
7. Water supply target temperature in cooling mode (5 to 20 °C, Std. +16 °C)

8. Target temperature of the hot-water tank (40 to 75 °C, Std. +55 °C)

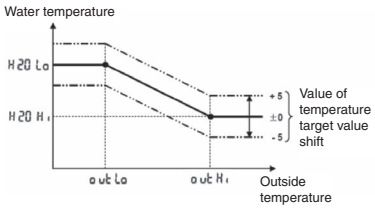
Note

No target temperatures can be entered for the water supply temperature in cooling mode on the operator control panel of the SDF versions.

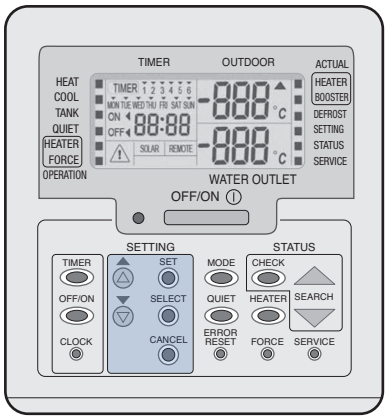
- Press the SELECT button to select the parameter.
- Use the UP or DOWN button to set the required temperature.
- Press the SET button to confirm the setting.
- Press the CANCEL button or wait 30 seconds to exit Setting mode.

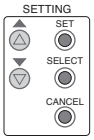


Weather compensation settings



out Lo	Low outside temperature
out Hi	High outside temperature
H_2O Lo	Water target temperature at low outside temperature
H_2O Lo	Water target temperature at high outside temperature

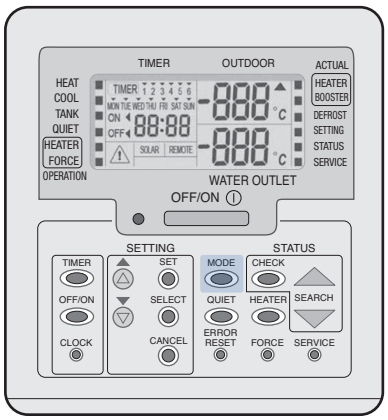




➤ Set the temperature shift as follows:

- ➤ Press the SET button (> 5 seconds).
  SETTING is shown on the display.
- ➤ Press the SELECT button to select the temperature shift.
- ➤ Use the UP or DOWN buttons to enter the required value (-5 to +5°C).
- ➤ Press the SET button to confirm the setting.
- ➤ Press the CANCEL button or wait 30 seconds to close the entry.

Setting the operating mode



➤ Set the operating mode as follows:

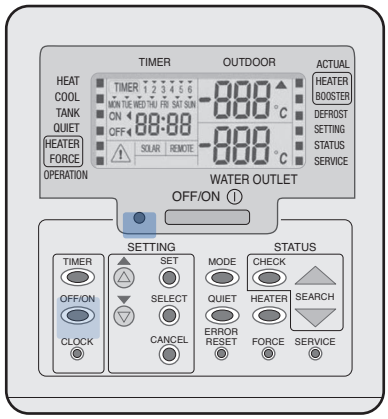
- ➤ Press the MODE button. The operating mode changes as follows every time the button is pressed:

SDF model: Heat ⟶ Heat + Tank ⟶ Tank

SDC model: Heat ⟶ Heat + Tank ⟶ Tank ⟶ Cool + Tank ⟶ Cool

Setting special functions

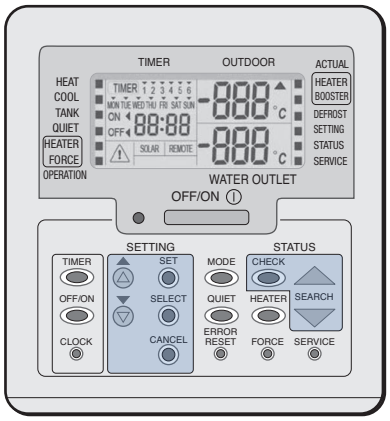
⚠ Danger!
During sterilisation, do not remove hot water, as this can lead to burns or overheating. The sterilisation function settings must be made by an authorised dealer in accordance with the local laws and guidelines.

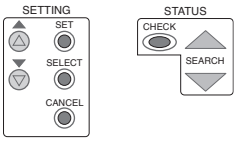


OFF/ON

➤ Switch the device off using the OFF/ON button before setting special functions (operation LED does not light up).

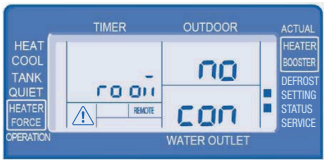
		Step	Display on operator control panel	Description
		1	room con	External room thermostat (YES/NO, Standard: NO) Setting whether an external room thermostat is connected.
		2	HEATER CAP	Select the required output of the additional electric heater (3, 6 or 9 kW, Standard: Maximum). The output of the additional electric heater can be reduced if higher power is not needed. This will depend on model selected.
		3	Ant i FrE	Water antifreeze function (YES/NO, Standard: YES) Activation or deactivation of the antifreeze function when the device is switched off.
		4	TANK con	Connection of a hot-water tank (YES/NO, Standard: NO) Setting whether a hot-water tank is connected. Note: If "Hot-water tank connected" is set to NO, steps 5 to 14 are skipped.
These menu items are only displayed if TANK is set to YES.		5	SOLAR Pry	Solar priority (YES/NO, Standard: NO) Setting the priority of the solar installation for water heating.
		6	HEAT Pry	Heating priority (YES/NO, Standard: NO) Setting the heating as a priority over hot water. Note: If "Heating priority" is set to YES, steps 7 to 8 are skipped.
	Only displayed if HEAT PRIORITY is set to NO	7	HEAT int	Duration of heating period Setting the duration of heating mode in the heating and water operating mode. (30 min. to 10 hours, Standard: 3 hours).
		8	TANK int	Water heating duration Setting the duration for water heating in the heating and water heating operating mode (5 min. to 1 hour 35 min., Standard: 30 min.).
		9	BOOSTER htr	Hot water immersion heating function (YES/NO, Standard: YES) Activation or deactivation of hot water immersion heater. Note: If the "Hot water immersion heating function" is set to NO, step 10 is skipped.
		10	BOOSTER dLy	Switch-on delay of the electric immersion heater for hot water Setting the delay period before the immersion heater is switched on for the hot-water tank if the tank temperature is not reached (20 min. to 1 hour 35 min., Standard: 1 hour).
	Sterilisation only appears if the TANK is set to YES.	11	Strl Fun	Sterilisation (YES/NO, Standard: YES) Setting for sterilisation of the hot water. Note: If "Heating priority" is set to YES, steps 12 to 14 are skipped.
		12	Str	Day and time of sterilisation (Standard: Monday 12:00 noon) Setting the day and time of weekly sterilisation (even when the device is switched off).
		13	Strl boi	Sterilisation temperature Setting the temperature to be used for sterilisation (40 to 75 , Standard: 70).
		14	Str oPr	Sterilisation duration Setting of the period required to retain the tank temperature needed for sterilisation (5 min. to 1 hour, Standard 10 min.).





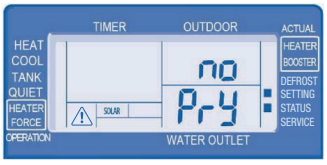
➤ Set the individual special functions as follows:

- ➤ Press the SET and CHECK buttons for 5 seconds to switch to Programming mode for the special settings. The SETTING (programming) and STATUS displays (system status) are shown.
- ➤ Use the UP or DOWN buttons to toggle through the functions.
- ➤ Press the SELECT button to access the settings for the respective function.
- ➤ Press the UP or DOWN buttons to activate (UP) or deactivate (DOWN) the functions, or to set the time and weekday.
- ➤ Press the SET button to confirm the setting.

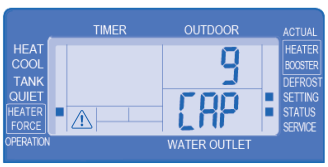


1. Connection of a room thermostat (YES/NO, Standard: NO)

3. Water antifreeze function (YES/NO, Standard: YES)



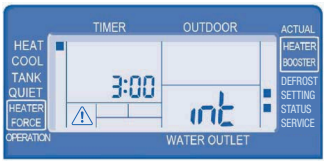
5. Solar priority (YES/NO, Standard: NO) If a solar thermal system is used, this value should always be set to YES.



2. Select the required output of the additional electric heater (3, 6 or 9 kW, Standard: Maximum)

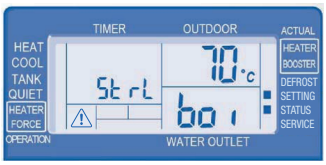
4. Connection of a hot-water tank (YES/NO, Standard: NO)

6. Heating priority (YES/NO, Standard: NO). If possible, this value should be left as NO, as otherwise hot water is only heated with the electric immersion heater.



7. Duration of heating period (30 min to 10 hours, Standard: 3 hours). Setting the duration for heating mode in the heating and water heating operating mode.

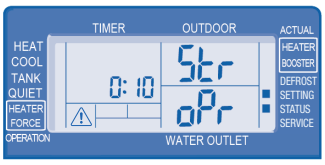
10. Switch-on delay of the electric immersion heater for hot water (20 min to 1 hour 35 min , Standard: 1 hour) Setting the delay period before the immersion heating is switched on for the hot-water tank if the tank temperature is not reached



13. Sterilisation temperature (40 to 75 , Standard: 70) Setting the temperature to be used for sterilisation.

8. Water heating duration (5 min to 1 hour 35 min, Standard: 30 min) Setting the duration for water heating in the heating and water heating operating mode

11. Sterilisation (YES/NO, Standard: YES) Setting for sterilisation of the hot water.



14. Sterilisation duration (5 min. to 1 hour, Standard: 10 min.) Setting the period required to retain the tank temperature required for sterilisation.

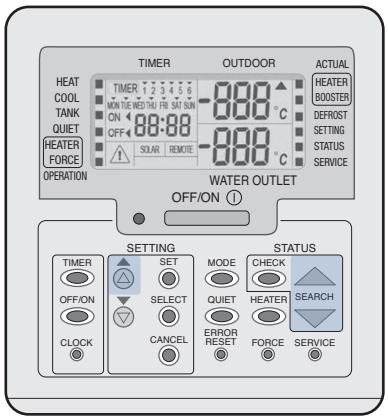
9. Hot water immersion heating function (YES/NO, Standard: NO)

12. Day and time of sterilisation (Standard: Monday 12:00 noon) Setting day and time of the weekly sterilisation.

Reset to factory settings

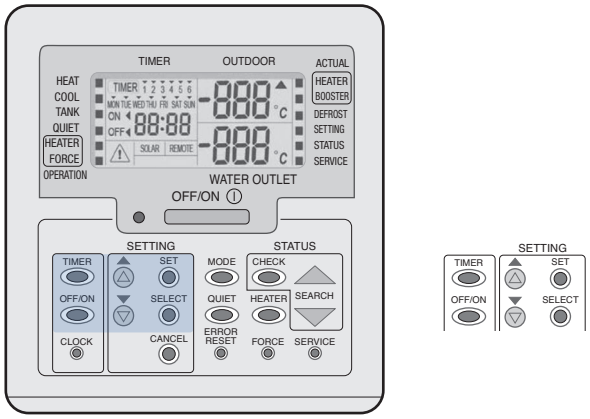
Note

All settings are preserved in the event of a power failure (stored in EPROM). The weekday and time are buffered by a battery for roughly 36 hours, after which they must be set again.



➤ Press the three marked operating buttons simultaneously for 5 seconds to reset to the factory settings.

Setting the weekly timer



- Open the timer by pressing the TIMER button.
- Set the date and time.
  - Press the UP or DOWN button until the required weekday is displayed.
  - Press the SELECT button to confirm the setting.
  - “1” flashes on the display. Press the SELECT button to set Program 1.
  - Press the OFF/ON button to select the activation/deactivation timer.
  - Use the UP or DOWN buttons to set the required time.

    In addition to the switching time, you can also set other modes using the MODE or QUIET buttons.
  - Press the SET button to confirm Program 1. The weekday selected is identified with the ▼ symbol.

    After 2 seconds, the display switches to the next program.
  - Repeat the above steps, starting with the OFF/ON button, to set programs 2 to 6.

    If no buttons are pressed for 30 seconds during timer setting, or if you press the SET button, the current setting is saved and the setting process is closed.

Changing or adding timer programs

➤ Repeat the above-mentioned steps

Deactivating the timer

➤ Press the TIMER button, then the CANCEL button.

Activating the timer

➤ Press the TIMER button, then the SET button.

Checking the timer program

➤ Press the TIMER button.

➤ Press the UP or DOWN button until the required weekday is displayed.

➤ Press the SELECT button to confirm the setting.

➤ Press the UP or DOWN buttons to check the programs set.

Deleting timer programs

➤ Press the TIMER button.

➤ Press the UP or DOWN button until the required weekday is displayed.

➤ Press the SELECT button to access the program setting.

➤ Press the UP or DOWN button until the required weekday is displayed.

➤ Press the CANCEL button to delete the program setting.

10 Appendix

10.1 Commissioning report

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Project		**Date:**		**Outdoor Model:**	
Site Address				**Outdoor Serial No:**	
				Indoor Model:	
Town		Postcode		**Indoor Serial No:**	
County				Tank Model	
Distributor				Tank Serial No:	
Contractor		Tel No:		Expansion Vessel	
Site Engineer				3rd Party Tank Type	
Type of System				Capacity	

Plumbing Pipework (Monobloc and Bi-Bloc)	Indoor to Tank :		Water Pipe Size :		
	Monobloc to Tank :		Water Pipe Size :		
	Water Volme (Primary) :		Anti-Freeze Added :		= °C

Wiring	**Power Supply 1**	**Power Supply 2**	**Power Supply 3**	**Refrigerant Pipework** (Bi-Bloc Only)	
Fuse Rating:				Bi-Bloc to indoor (3m Min)	
Isolator: [Y/N]				Additional Charge :	
L-N				Gas Pipe Size :	
L-E				Liquid Pipe Size :	
N-E				Vacuum Test	
Max Running Amps				Pressure Test	

Checks				**Solar Connections**	NO
	Heating Mode		3-Way Valve Check :		
Water Flow Test	l/min	AB / A / DHW / B / HEATING	NO		
	DHW Mode		Pump Speed		
Water Flow Test	l/min				

Wiring Connections

NOTE:

Please ensure that all connections are clearly marked / indicated

2-Way Valve			3-Way Valve				Booster		Receiver				OLP		Tank Sensor		External Control.		Solar 3-Way Valve				Solar Pump	
1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		22	23
Close	Open	N	Close	Open	N		L	N	L	N	Cool	Heat					Volt free	Volt free	N	Close	Open			

3-WAY VALVE 1 = CLOSE ON B

LINK REQ. WITH 3rd PARTY TANK

Notes :

Please indicate any observations relating to the installation that may assist in understanding how the system has been installed.

These observations may assist in any future warranty claim or

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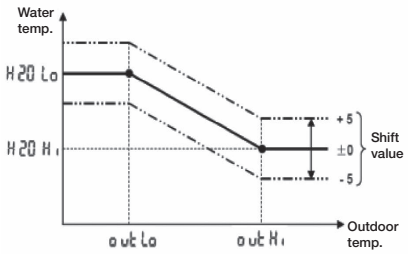
Settings			Setting Range	Recommended settings	Settings
Press **SET** for 4 Seconds to Access Settings					
1	Outdoor Ambient Low	To_Lo	-15 ~ 15	5	
2	Outdoor Ambient High	To_Hi	-15 ~ 15	15	
3	Water Temp @ Low	Tw_Hi	25 ~ 55	55*	
4	Water Temp @ High	Tw_Lo	25 ~ 55	45	
5	Outdoor Ambient Set Temp: Heating OFF		5 ~ 35	20	
6	Outdoor Ambient Set Temp: Heater Operation:		-15 ~ 20	-5	
7	Water Set Temp during Cool Mode		5 ~ 20		
8	Sanitary Tank Set Temp		40 ~ 75	50 / 60**	
9	Water Temp Thermo Shift:		-5 ~ 5	0	
Press **SET** and **CHECK** for 4 Seconds			* Temp must be lower with underfloor heating ** Sanitary tank temp will be higher for HT systems † Backup Heater options vary dependant on model		
10	External Room Controller		Yes / No		NO
11	Backup Heater Capacity		3 / 6 / 9 kW†		
12	Water System Freeze Protection		Yes / No	Yes	NO
13	Tank Connection		Yes / No		NO
14	Solar Priority		Yes / No	No	NO
15	Heating Priority		Yes / No	No	NO
16	Heating Interval		0.5 ~ 10 hrs	01:00	
17	Tank Interval		0:05 ~ 1:35 hrs	00:30	
18	Booster Heater Function Activate		Yes / No		NO
19	Booster Delay		0:20 ~ 1:35 hrs	00:25	
20	Sterizaltion		Yes / No	Yes	NO
21	Sterilization Time/Day				
22	Sterilization Temperature Set		40 ~ 75	65	
23	Sterilization Continue Time		0.05 ~ 1:00 hr	01:00	

IMPORTANT NOTE:

Please carryout all steps during commissioning. Failure to complete steps may result in lack of functionality or poor performance



NO: Steps 14 ~ 23 skipped

YES: Steps 16 ~ 17 skipped

NO: Step 19 skipped

NO: Step 21 ~ 23 skipped

Timers	1	1/0	T	H	Q	2	1/0	T	H	Q	3	1/0	T	H	Q	4	1/0	T	H	Q	5	1/0	T	H	Q	6	1/0	T	H	Q
Monday																													
Tuesday																													
Wednesday																													
Thursday																													
Friday																													
Saturday																													
Sunday																													

Key: **1/0:** On / Off **T:** Tank On **H:** Heating On **Q:** Quiet Mode On

Performance Check :

Heating Mode	OD Temp :		Water Out :		Water In :		Delta T :		Compressor Frequency :	
Tank Mode	OD Temp :		Water Out :		Water In :		Delta T :		Compressor Frequency :	

Comments:

Customer Signature : Print :

The above settings have been explained to me, including weather compensator, and understand what an Air to Water Heat Pump is.

Commissioned by : Date : Commissioned Status: FAIL

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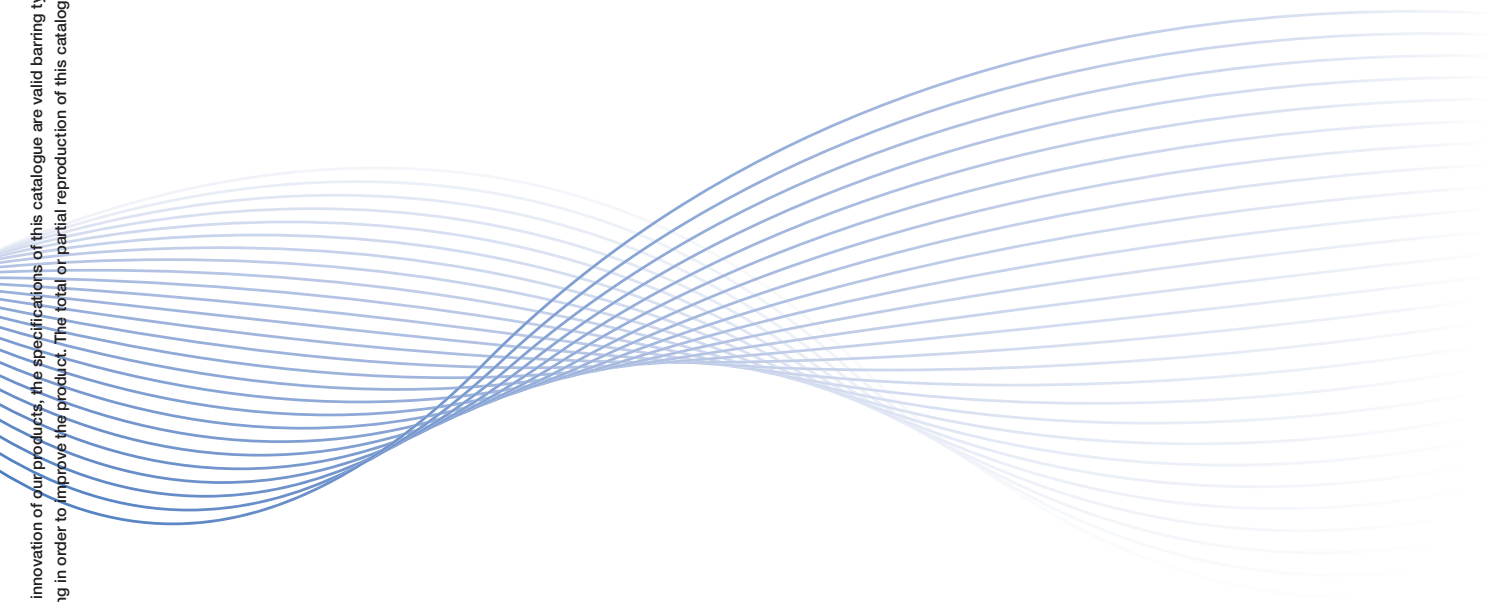

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