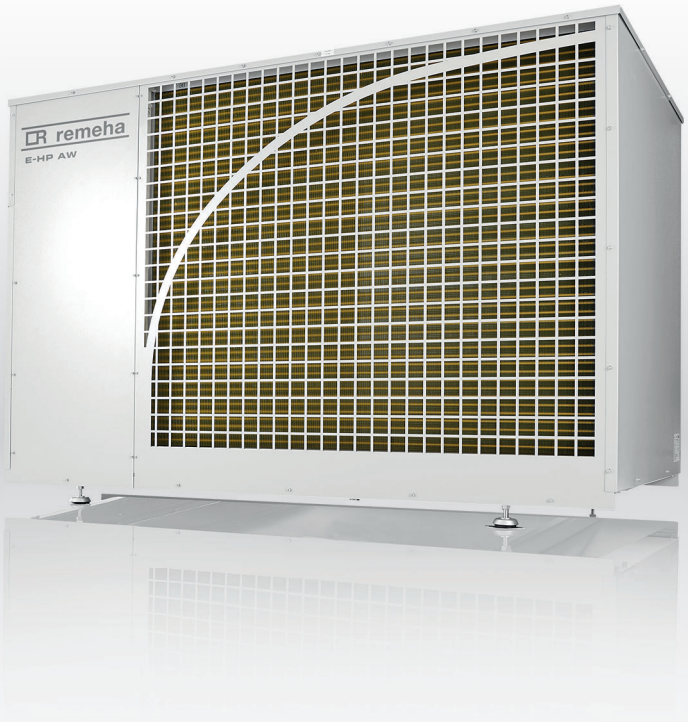
United Kingdom
en

remeha

44 Ace B

MCS CERTIFIED



Installation and user manual

Air/water heat pumps

E-HP AW

44 (Cool) Ace B
88 (Cool) Ace B
168 (Cool) Plus B

Dear Customer,

Thank you very much for buying this appliance.

Please read through the manual carefully before using the product, and keep it in a safe place for later reference. In order to ensure continued safe and efficient operation we recommend that the product is serviced regularly. Our service and customer service organisation can assist with this.

We hope you enjoy years of problem-free operation with the product.

Contents

1 Safety

1.1 Personnel qualification

- The installation and maintenance of the appliance must be performed by a qualified technician in accordance with local and national regulations.
- Only approved and certified technicians are allowed to work on the refrigerant circuit.
- Installation and maintenance performed by under qualified technicians (where applicable) will void the warranty of the product.

1.2 General safety instructions

Danger
To prevent (possible) personal injury, death, or damage to the device or property:

- Make sure that you know and obey all safety instructions and safety provisions of the device.
- Obey local safety rules and regulations.
- When performing maintenance or any other work, disconnect the device from the power supply and wait at least 10 seconds before you start working on it.
- The refrigerant circuit of the heat pump must be controlled by certified staff, according to regulation EC 517/2014, at least every twelve months, in order to check if the system is leak proof. When the device is equipped with the leak detection option, inspections can take place at 24 month intervals.

1.3 Water quality requirements

The water quality of the heating circuit must comply with the national regulations.

The table below indicates which value of various properties are acceptable for certain materials of plate heat exchangers and which are not.

+ The used materials have sufficient resistance.
0 There is a risk of corrosion, water treatment is advisable.
- High risk of corrosion, water treatment is required.

Tab.1 Water quality requirements

Property	Unit	Heat exchanger	Rating
Conductivity	µ-Siemens / cm (at 20°C)	< 700	+
pH-value	pH	< 6 6 - 7 7 - 9 > 9	- 0 + -
Total hardness	°dH	< 15 > 15	+ 0
Chloride	ppm	< 100	+
Sulphate	ppm	< 50 50 - 100 > 100	+ 0 -
Carbon dioxide	ppm	< 5 5 - 10 > 10	+ 0 -
Ratio [HCO3-] / [SO42-]		> 1	+
Nitrate	ppm	< 100	+
Oxygen	ppm	< 1 1-8 > 8	+ 0 -

Property	Unit	Heat exchanger	Rating
Ammonia	ppm	< 2 2 - 10 > 10	+ 0 -
Solute iron	ppm	< 0.2 0.2 - 0.5 > 0.5	+ 0 -
Solute manganese	ppm	< 0.05 0.05 - 0.1 > 0.1	+ 0 -
Hydrogen sulphide	ppm	0.05	+
Free chlorine	ppm	0.5	+
Solids (suspended); Imperatively avoid fibre substances	mg/l	< 10 > 10	- 0

Caution
A flow switch must be fitted in the hydraulic system. This flow switch protects the heat pump against interrupted flows. If the flow becomes interrupted, severe damage to the heat pump can occur.

1.4 Intended use

Caution
This machine is designed to be able to operate at humidity levels of 50% at a maximum outdoor temperature of 35 °C. Please check with the installer for additional settings at higher humidity levels or temperatures.

The E-HP AW is a heat pump that can be used in combination with a central heating system or a communal heating system. In order to achieve the listed efficiency of the heat pump, it is required that the heated water is distributed through a low temperature heating system, such as underfloor heating or low temperature radiators. Installations that use higher flow temperatures will result in a lower efficiency and therefore higher heating costs.

The device can also be used for dry heating new buildings. In a new building there are huge quantities of water present in walls, plaster and screed, which need to dry out. The device can assist the process of dry heating.

The Cool versions have active cooling which makes it possible to use the device for active cooling of the building. This should be installed with an appropriate distribution system.

All other uses are considered as misuse and will void the warranty.

1.5 Specific safety instructions

1.5.1 Safety for cooling

Important
When the heat pump is in cooling mode, condensation can occur inside the building. Condensation may cause damage to the building and/or cause health issues. When using E-HP AW devices with active cooling, It is therefore recommended to install safety devices, such as condensation monitoring.

1.6 Liabilities

1.6.1 Manufacturer's liability

Our products are manufactured in compliance with the requirements of the various Directives applicable. They are therefore delivered with the UKCA marking and any documents necessary. In the interests of the quality of our products, we strive constantly to improve them. We therefore reserve the right to modify the specifications given in this document.

Our liability as manufacturer may not be invoked in the following cases:

- Failure to abide by the instructions on installing and maintaining the appliance.
- Failure to abide by the instructions on using the appliance.
- Faulty or insufficient maintenance of the appliance.

1.6.2 Installer's liability

The installer is responsible for the installation and initial commissioning of the appliance. The installer must observe the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Install the appliance in compliance with prevailing legislation and standards.
- Carry out initial commissioning and any checks necessary.
- Explain the installation to the user.
- If maintenance is necessary, warn the user of the obligation to check the appliance and keep it in good working order.
- Give all the instruction manuals to the user.

1.6.3 User's liability

To guarantee optimum operation of the system, you must abide by the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Initial commissioning by the BAXI customer service or customer service partner are prerequisites for the warranty in accordance with the enclosed "Warranty conditions".
- Get your installer to explain your installation to you.
- Have the required inspections and maintenance carried out by a qualified installer.
- Keep the instruction manuals in good condition close to the appliance.

2 About this manual

2.1 Additional documentation

2.1.1 Declaration of conformity

For a declaration of conformity, please contact the manufacturer.

2.2 Symbols used

2.2.1 Symbols used in the manual

This manual uses various danger levels to draw attention to special instructions. We do this to improve user safety, to prevent problems and to guarantee correct operation of the appliance.

Danger
Risk of dangerous situations that may result in serious personal injury.

Danger of electric shock
Risk of electric shock.

Warning
Risk of dangerous situations that may result in minor personal injury.

Caution
Risk of material damage.

Important
Please note: important information.

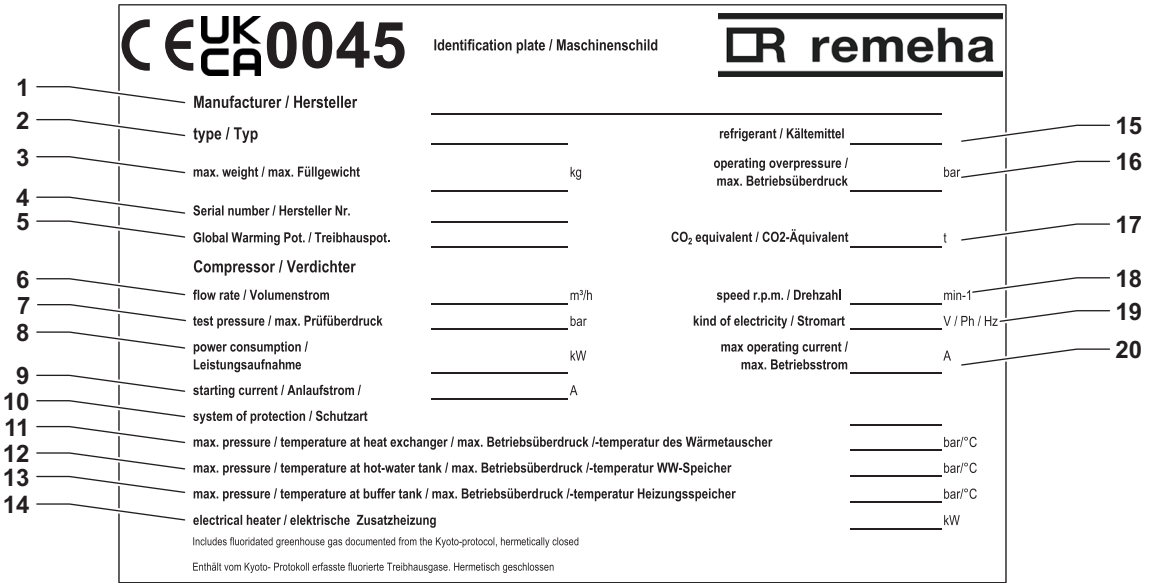
See
Reference to other manuals or pages in this manual.

3 Technical specifications

3.1 Technical data

3.1.1 Type plate

Fig.1 Type plate E-HP AW



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1 Manufacturer
2 Type
3 Maximum filling weight
4 Serial number
5 GWP
6 Flow rate
7 Test pressure
8 Power consumption
9 Starting current
10 Protection
11 Maximum pressure / temperature at heat exchanger
12 Maximum pressure / temperature at hot water tank
13 Maximum pressure / temperature at buffer tank
14 Electrical heater
15 Refrigerant
16 Maximum operating pressure
17 CO_2 equivalent
18 Speed (revolutions per minute)
19 Power supply
20 Maximum operating current

3.1.2 Technical data

Tab.2 Technical data E-HP AW

	Unit	44 Ace B	88 Ace B	168 Ace B
MCS Accredited		KIWA00043/001 HP	No	No
Heating capacity at A7/W35	kW	43.32	68.64	151.08
Power input at A7/W35	kW	7.81	15.24	32.65
COP at A7/W35	-	4.40	4.50	4.64
Heating capacity at A-7/W35	kW	23.51	47.03	98.52
Power input at A-7/W35	kW	7.48	14.60	30.80
COP at A-7/W35	-	3.14	3.22	3.26
Refrigerant	-	R407c	R407c	R407c
Sound power level (1)	dB(A)	65	67	76
Protection class	-	IP42	IP42	IP42
Nominal volume flow rate, sink	m³/h	5.92	11.84	23.67
Delta-T (min-max)	°C	5-7	5-7	5-7
Pressure drop	kPa	15	25	46
Operating limits, source [air]	°C	-20 to +35	-20 to +35	-15 to +35
Nominal volume flow rate, source	m³/h	8500	17100	34100
Max. supply temperature	°C	65	65	60

	Unit	44 Ace B	88 Ace B	168 Ace B
Compressor power supply	Phases	3 + neutral	3 + neutral	3 + neutral
Compressor power supply	Hz	50	50	50
Compressor power supply	V	400	400	400
Nominal voltage ventilator	V	230	230	230
Nominal voltage controller	V	230	230	230
Max. operating current MCC	A	26.7	53.4	2x 60.4
Max. starting current	A	96	122.7	2x 126.2
Starting current with soft starter 1st compressor	A	57.6	73.6	2x 75.7
Starting current with soft starter 2nd compressor (2)	A	-	100.3	2x 105.9
Nominal current (based on air 7 and temperature of 55 °C of the water supply)	A	19.1	38.2	2x 43.2
Connection to boiler	Inch	1 1/2"	2"	2 1/2"
Weight	kg	460	790	1800
Refrigerant weight	kg	13	17	34 (2 x 17)

(1) In accordance with ISO 9614-2 under condition A7/W55.
(2) The accumulated starting current is calculated with the stating current of the second compressor and the maximum operating current (MCC) of the first compressor, seen as the worst-case scenario.

Tab.3 Technical data E-HP AW with active cooling

	Unit	44 Cool Ace B	88 Cool Ace B	168 Cool Ace B
MCS Accredited		No	No	No
Heating capacity at A7/W35	kW	43.32	68.64	151.08
Power input at A7/W35	kW	7.81	15.24	32.56
COP at A7/W35	-	4.40	4.50	4.64
Heating capacity at A7/W35	kW	23.51	47.03	94.05
Power input at A-7/W35	kW	7.48	14.60	30.80
COP at A-7/W35	-	3.14	3.22	3.26
Cooling capacity at A35/W7 (1)	kW	36.73	73.43	158.88
Power input at A35/W7	kW	9.12	17.81	37.43
COP at A35/W7	-	4.03	4.13	4.25
Refrigerant	-	R407c	R407c	R407c
Sound power level (2)	dB(A)	65	67	67
Protection class	-	IP42	IP42	IP42
Nominal volume flow rate, sink	m³/h	5.92	11.84	23.67
Pressure drop	kPa	18	19	9
Operating limits, source [air]	°C	-20 to +35	-20 to +35	-15 to +35
Nominal volume flow rate, source	m³/h	8500	17100	34100
Max. supply temperature	°C	65	65	60
Compressor power supply	Phases	3 + neutral	3 + neutral	3 + neutral
Compressor power supply	Hz	50	50	50
Compressor power supply	V	400	400	400
Nominal voltage ventilator	V	230	230	230
Nominal voltage controller	V	230	230	230
Power input controller	kW	7.9	15.0	16.5
Max. operating current MCC	A	26.7	53.4	2x 60.4
Min. cross section power cables	mm^2	10	16	16
Max. starting current	A	96	122.7	2x 126.2
Starting current with soft starter 1st compressor	A	57.6	73.6	2x 75.7
Starting current with soft starter 2nd compressor (3)	A	-	100.3	2x 105.9

	Unit	44 Cool Ace B	88 Cool Ace B	168 Cool Ace B
Nominal current (based on air 7 and temperature of 55 °C of the water supply)	A	19.1	38.2	2x 43.2
Connection to boiler	Inch	1 1/2"	2"	2 1/2"
Weight	kg	460	790	2300
Refrigerant weight	kg	14	18	36 (2x18)

(1) In case a supply temperature below 17 °C is requested, an external 4-way valve must be used.
(2) In accordance with ISO 9614-2 under condition A7/W55.
(3) The accumulated starting current is calculated with the stating current of the second compressor and the maximum operating current (MCC) of the first compressor, seen as the worst-case scenario.

Tab.4 Technical parameters

E-HP AW			E-HP AW 44 (Cool)	E-HP AW 88	E-HP AW 168 (Cool)
Air-to-water heat pump			Yes	Yes	Yes
Water-to-water heat pump			No	No	No
Brine-to-water heat pump			No	No	No
Low-temperature heat pump			No	No	Yes
Equipped with a supplementary heater			No	No	No
Heat pump combination heater			No	No	No
Rated heat output under average climate conditions (1)	*Prated*	kW	23	53	112
Rated heat output under colder climate conditions (1)	*Prated*	kW	-	-	-
Rated heat output under warmer climate conditions (1)	*Prated*	kW	-	-	-
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j					
T_j = -7 °C	*Pdh*	kW	19.2	46.8	98.6
T_j = +2 °C	*Pdh*	kW	29.8	59.5	131.0
T_j = +7 °C	*Pdh*	kW	34.1	68.3	155.2
T_j = +12 °C	*Pdh*	kW	38.6	77.2	180.8
T_j = bivalent temperature	*Pdh*	kW	20.0	46.8	98.8
T_j = operation limit temperature	*Pdh*	kW	20.0	43.6	94.3
T_j = -15 °C (if TOL < -20 °C)	*Pdh*	kW	-	-	-
Bivalent temperature	T_{biv}	°C	-10	-7	-10
Cycling interval capacity for heating	*Pcych*	kW	-	-	-
Degradation co-efficient(2)	*Cdh*	—	0.99	0.99	0.99
Seasonal space heating energy efficiency under average climate conditions	η_s	%	161	168	174
Seasonal space heating energy efficiency under colder climate conditions	η_s	%	-	-	-
Seasonal space heating energy efficiency under warmer climate conditions	η_s	%	-	-	-
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j					
T_j = -7 °C	*COPd*	-	2.82	3.29	3.30
T_j = +2 °C	*COPd*	-	4.10	4.23	4.43
T_j = +7 °C	*COPd*	-	4.85	4.93	5.23
T_j = +12 °C	*COPd*	-	5.55	5.43	6.03
T_j = bivalent temperature	*COPd*	-	2.82	3.29	3.30
T_j = operation limit temperature	*COPd*	-	2.82	3.02	3.10

E-HP AW			E-HP AW 44 (Cool)	E-HP AW 88	E-HP AW 168 (Cool)
T_j = -15 °C (if TOL < -20 °C)	*COPd*	-	-	-	-
Operation limit temperature for air-to-water heat pumps	*TOL*	°C	-20	-20	-15
Cycling interval efficiency	*COPcyc*	-	-	-	-
Heating water operating limit temperature	*WTOL*	°C	65	65	60
Power consumption					
Off mode	P_{OFF}	kW	0.095	0.095	0.095
Thermostat-off mode	P_{TO}	kW	0.095	0.095	0.095
Standby mode	P_{SB}	kW	0.095	0.095	0.095
Crankcase heater mode	P_{CK}	kW	0.001	0.001	0.001
Supplementary heater					
Rated heat output(2)	*Psup*	kW	4.0	9.0	17.0
Type of energy input			-	-	-
Other items					
Capacity control			fixed	variable	variable
Sound power level, indoors - outdoors	L_{WA}	dB	0 - 65	0 - 67	0 - 67
Annual energy consumption under average climate conditions	Q_{HE}	kWh	10094	25693	42860
Annual energy consumption under colder climate conditions	Q_{HE}	kWh	-	-	-
Annual energy consumption under warmer climate conditions	Q_{HE}	kWh	-	-	-
Rated air flow rate, outdoors for air-to-water heat pumps	—	m^3/h	8500	17100	37800
Rated brine or water flow rate, outdoor heat exchanger for water- or brine-to-water heat pumps	—	m^3/h	-	-	-

(1) The rated heat output *Prated* is equal to the design load for heating *Pdesignh*, and the rated heat output of a supplementary heater *Psup* is equal to the supplementary capacity for heating *sup(Tj)*.
(2) If *Cdh* is not determined by measurement then the default degradation coefficient is *Cdh* = 0,9.

3.2 Dimensions and connections

3.2.1 Dimensions

Fig.2 Dimensions of the E-HP AW 44

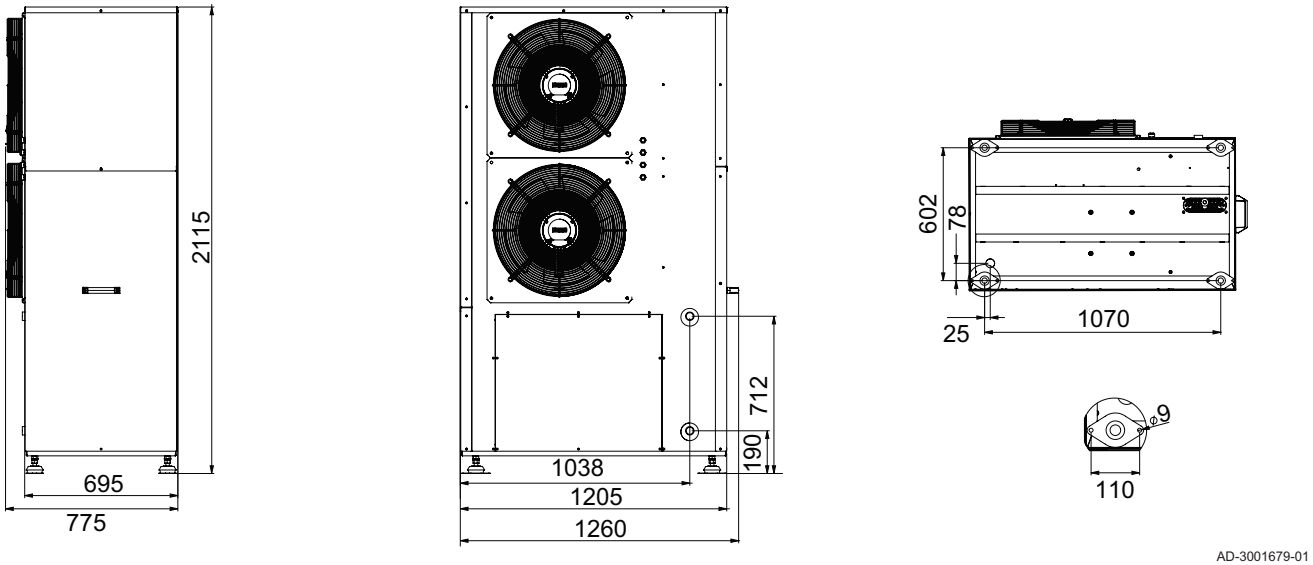

Fig.3 Dimensions of the E-HP AW 88

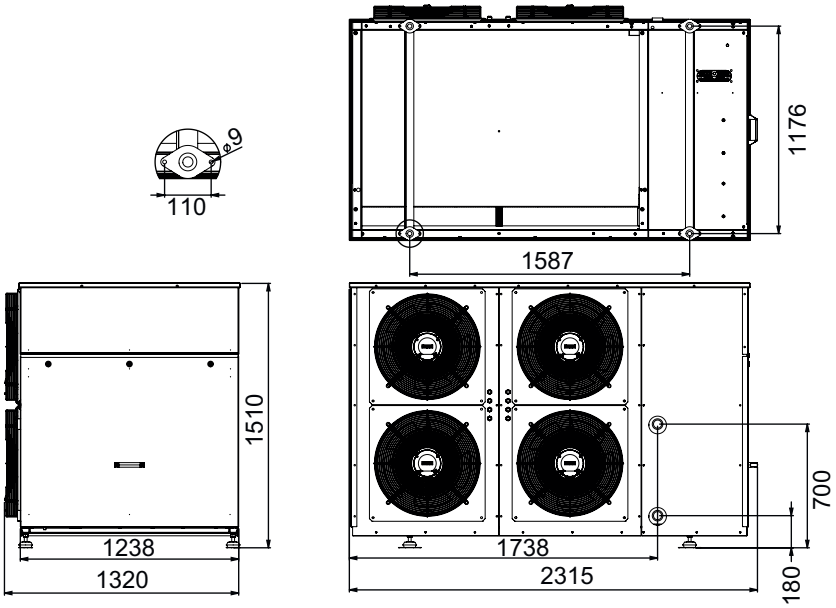

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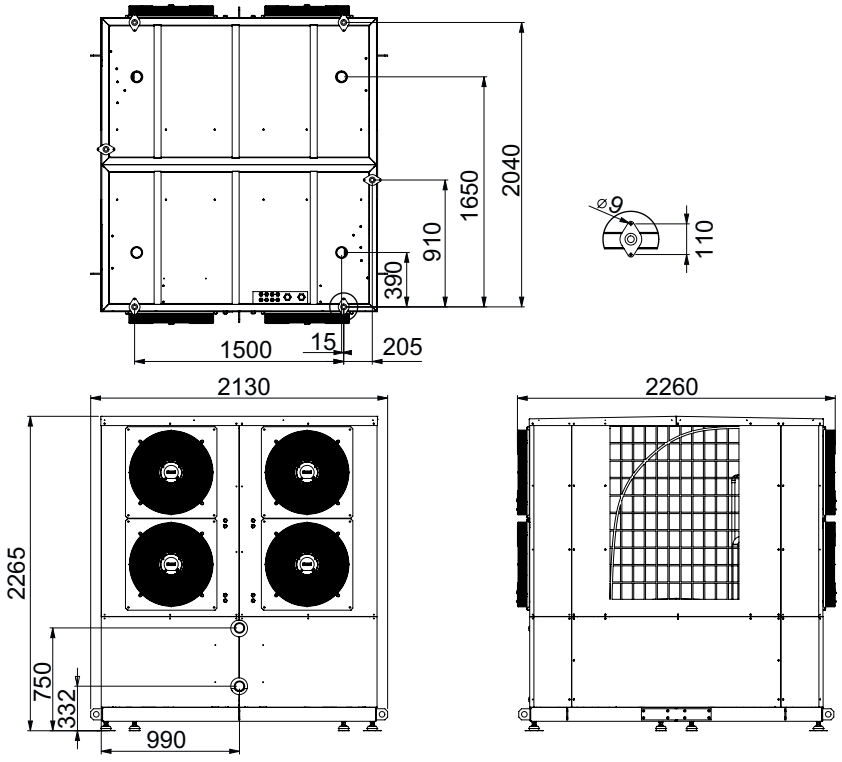
Fig.4 Dimensions of the E-HP AW 168



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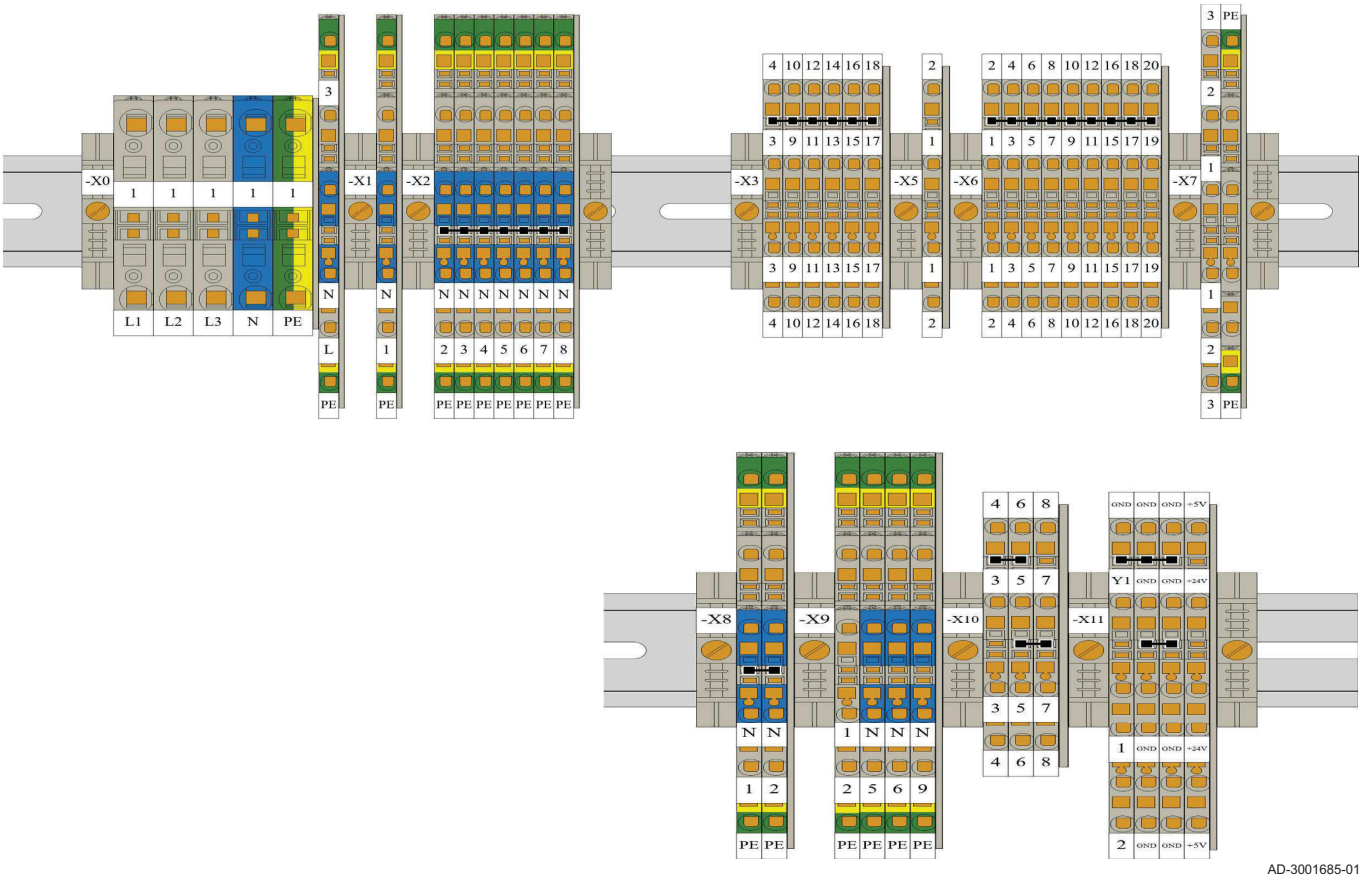
3.3 Electrical diagram

3.3.1 Electrical connections

The actual drawing of the electric connections is attached to the cabinet inside the heat pump. This drawing always shows the most recent information.

Fig.5 E-HP AW 44 extern/intern



Tab.5 Connections -X0

-X0	
L1	Power supply Compressor + Fan
L2	
L3	
N	
PE	Power supply Control
L-N-PE	

Tab.6 Connections -X1

-X1	
1-N-PE	Power supply 3- way valve

Tab.7 Connections -X2

-X2	
2-N-PE	Heating Cooling Contact 230V, max. 1A
3-N-PE	Hot water request 230V, max. 1A
4-N-PE	Heating Cooling Contact 230V, max. 1A
5-N-PE	Additional heating 230V, max. 1A
6-N-PE	Operating / Storage charge 230V, max. 1A

-X2	
7-N-PE	Solar pump 230V, max. 1A
8-N-PE	Suction Pump 230V, max. 1A

Tab.8 Connections -X3

-X3	
3-4	Flow / Pressure switch
9-10	External thermostat
11-12	Remote on / off
13-14	Smart Grid 1 / Tariff
15-16	Smart Grid 2 / Tariff
17-18	Deactivation load pump

Tab.9 Connections -X5

-X5	
1-2	Central fault

Tab.10 Connections -X6

-X6	
1-2	Outside temperature
3-4	Hot water temperature
5-6	Mixing circuit temperature 1 / source defrost
7-8	Mixing circuit temperature 2 collector temperature
9-10	Set point, Space, Buffer or Heating solar storage tank temperature
11-12	Buffer tank sensor
15-16	Control of the return pump 0-10V
17-18	Control mixer 1 0-10V
19-20	Control mixer 2 0-10V

Tab.11 Connections -X7

-X7	
1	pLAN connection
2	
3	
PE	

Tab.12 Connections -X8

-X8	
1-N-PE	Power supply fan 1
2-N-PE	Power supply fan 2

Tab.13 Connections -X9

-X9	
1-2	Safety chain HD
5-N-PE	4-way valve
6-N-PE	EVI solenoid valve
9-N-PE	Crankcase heater

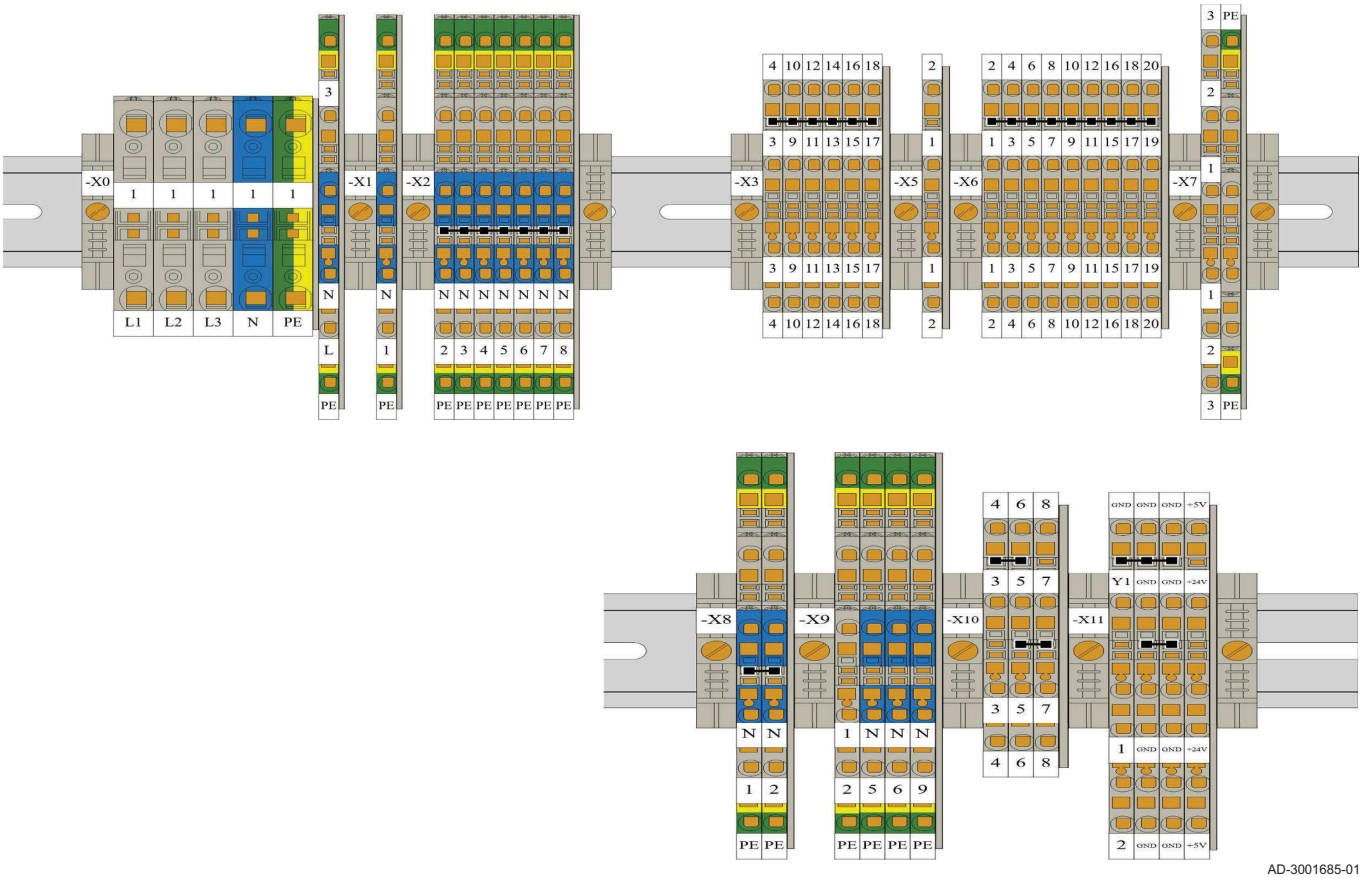
Tab.14 Connections -X10

-X10	
3-4	Generator overload compressor 1
5-6	Safety fan 1
7-8	Safety fan 2

Tab.15 Connections -X11

-X11	
1-2	Fan control 1-2
GND	Grounding B3-17
5V	Power supply 5V Sensor B11 & 12
24V	Power supply 24V Sensor B17

Fig.6 E-HP AW 88 extern/intern



Tab.16 Connections -X0

-X0	
L1	Power supply Compressor + Fan
L2	
L3	
N	
PE	Power supply Control
L-N-PE	

Tab.17 Connections -X1

-X1	
1-N-PE	Power supply 3- way valve

Tab.18 Connections -X2

-X2	
2-N-PE	Heating Cooling Contact 230V, max. 1A
3-N-PE	Hot water request 230V, max. 1A
4-N-PE	Heating Cooling Contact 230V, max. 1A
5-N-PE	Additional heating 230V, max. 1A
6-N-PE	Operating / Storage charge 230V, max. 1A
7-N-PE	Solar pump 230V, max. 1A
8-N-PE	Return pump 230V, max. 1A

Tab.19 Connections -X3

-X3	
3-4	Flow / Pressure switch
9-10	External thermostat
11-12	Remote on / off
13-14	Smart Grid 1 / Tariff
15-16	Smart Grid 2 / Tariff
17-18	Deactivation return pump

Tab.20 Connections -X5

-X5	
1-2	Central fault

Tab.21 Connections -X6

-X6	
1-2	Outside temperature
3-4	Hot water temperature
7-8	Mixing circuit temperature 2 collector temperature
9-10	Set point, Space, Buffer or Heating solar storage tank temperature
11-12	Buffer tank sensor
15-16	Control of the return pump 0-10V
19-20	Control mixer 2 0-10V

Tab.22 Connections -X7

-X7	
1	pLAN connection
2	
3	
PE	

Tab.23 Connections -X8

-X8	
1-N-PE	Power supply fan 1
2-N-PE	Power supply fan 2
3-N-PE	Power supply fan 3
4-N-PE	Power supply fan 4

Tab.24 Connections -X9

-X9	
1-2	Safety chain HD
5-N-PE	4-way valve
6-N-PE	EVI solenoid valve 1
7-N-PE	EVI solenoid valve 2
8-N-PE	EVI solenoid valve 3
9-N-PE	Crankcase heater 1
10-N-PE	Crankcase heater 2

Tab.25 Connections -X10

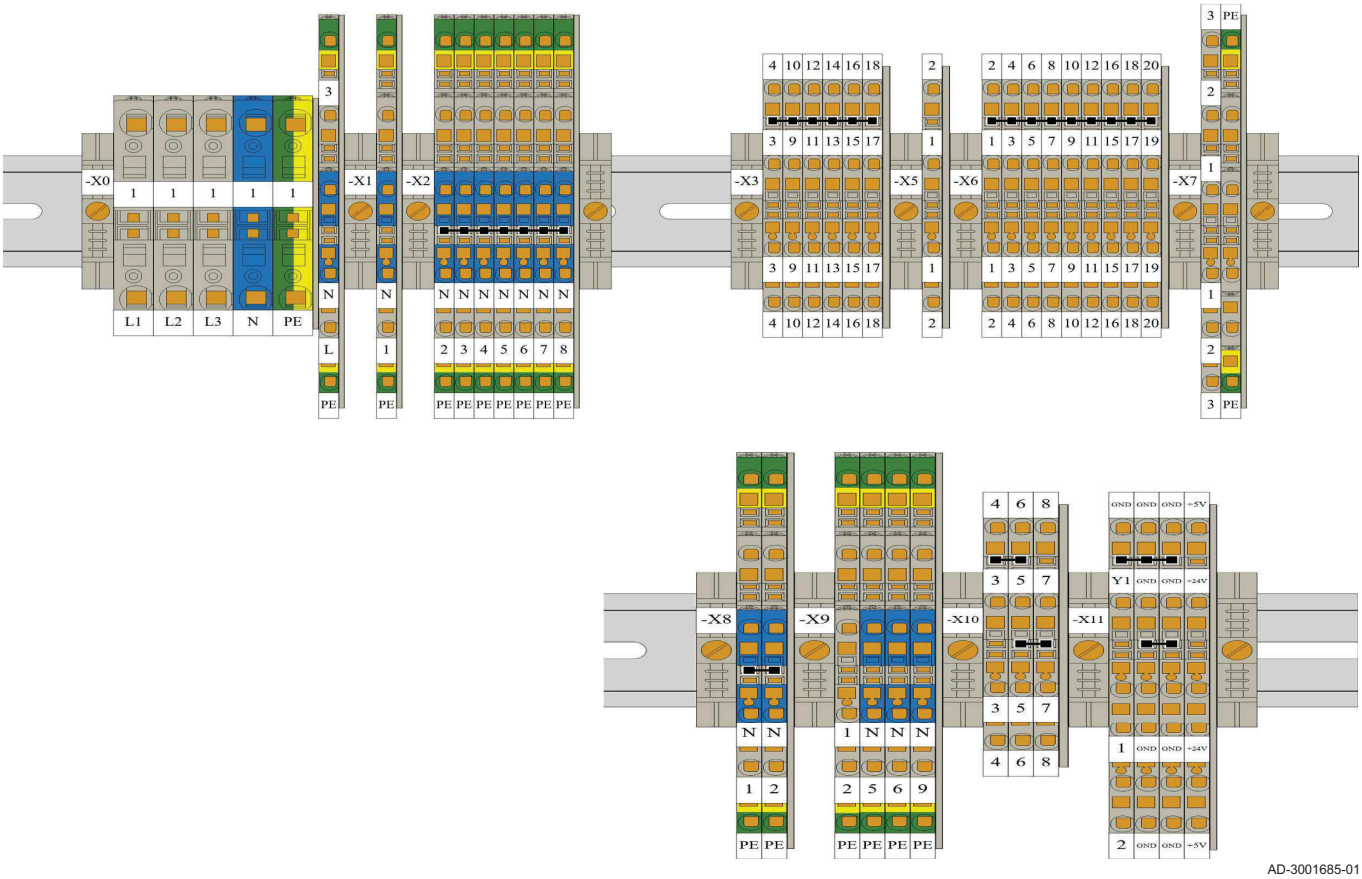
-X10	
1-2	Generator overload compressor 1
3-4	Generator overload compressor 2
5-6	Safety fan 1
7-8	Safety fan 2
9-10	Safety fan 3
11-12	Safety fan 4

Tab.26 Connections -X11

-X11	
1-2	Fan control 1-4
GND	Grounding B3-17
5V	Power supply 5V Sensor B11 & 12
24V	Power supply 24V Sensor B17

Important
Note that part E may look different, depending on the type of your device. However, the connections to be made remain the same.

Fig.7 E-HP AW 168 Master/slave



Tab.27 Connections -X0

-X0	
L1	Power supply Compressor + Fan
L2	
L3	
N	
PE	Power supply Control
L-N-PE	

Tab.28 Connections -X1

-X1	
1-N-PE	Power supply 3- way valve

Tab.29 Connections -X2

-X2	
2-N-PE	Heating Cooling Contact 230V, max. 1A
3-N-PE	Hot water request 230V, max. 1A
4-N-PE	Heating Cooling Contact 230V, max. 1A
5-N-PE	Additional heating 230V, max. 1A
6-N-PE	Operating / Storage charge 230V, max. 1A

-X2	
7-N-PE	Solar pump 230V, max. 1A
8-N-PE	Suction Pump 230V, max. 1A

Tab.30 Connections -X3

-X3	
3-4	Flow / Pressure switch
9-10	External thermostat
11-12	Remote on / off
13-14	Smart Grid 1 / Tariff
15-16	Smart Grid 2 / Tariff
17-18	Deactivation return pump

Tab.31 Connections -X5

-X5	
1-2	Central fault

Tab.32 Connections -X6

-X6	
1-2	Outside temperature
3-4	Hot water temperature
7-8	Mixing circuit temperature 2 collector temperature
9-10	Set point, Space, Buffer or Heating solar storage tank temperature
11-12	Buffer tank sensor
15-16	Control of the return pump 0-10V
19-20	Control mixer 2 0-10V

4 Description of the product

4.1 Product types

There are different types of the E-HP AW heat pump:

- E-HP AW 44 Ace B
- E-HP AW 88 Ace B
- E-HP AW 168 Plus B

- E-HP AW 44 Cool Ace B
- E-HP AW 88 Cool Ace B
- E-HP AW 168 Cool Plus B

The naming of these products is to be interpreted as follows:

- E-HP AW: Electrical heat pump air/water.
- Number: the capacity of the E-HP AW in kW.
- Cool: indicates that the device is equipped with an active cooling option.
- B: indicates that it is version 2 of the product.
- Plus/Ace: indicates the operating limits of the device. The Ace can be used at lower outdoor temperatures and deliver a higher flow temperature.

4.2 Operating principle

4.2.1 Operating principle for heating

The E-HP AW heat pump extracts energy from the outdoor air and uses it to heat up a water flow. The heated water flow is then used in a heating system and for domestic hot water supply.

The energy of the outdoor air is lead to a refrigerant, which heats up and vaporizes. The compressor increases the pressure and thus the temperature even more. In the plate heat exchanger (condenser), the refrigerant condenses, releasing its heat to the hot water circuit and/or buffer tank. The refrigerant cools down and thus condensates. It is then fed to the evaporator again through an expansion valve, which reduces the pressure of the fluid.

The devices with a larger capacity (>48 kW) work in multiple stage operation. Additional compressors will be deployed in case of increased heat demand. In normal operation the compressors work alternately. The leading compressor changes every time the machine starts. The fans will continuously adjust their speed in accordance with the heating/cooling demand.

When the outdoor temperature is low or the humidity in the air is high there might be a build up of ice on the evaporator. If the amount of ice becomes too much the heat pump will automatically start a defrost sequence. During this the circulation pump will run at the maximum speed.

At extremely low outside temperatures the unit may occasionally shut down for short periods to protect itself during operation.

4.2.2 Active cooling

The E-HP AW 'Cool' versions are equipped with a module for active cooling. This cooling function is based on the reversed functioning of the heat pump. The heat pump is equipped with a 4-way valve to reverse the operation. If the heat pump will be used for cooling, the distribution system inside the building must be suited for this type of operation. The low supply temperature in cooling mode could cause condensation of the installation and the pipework must therefore be properly insulated.

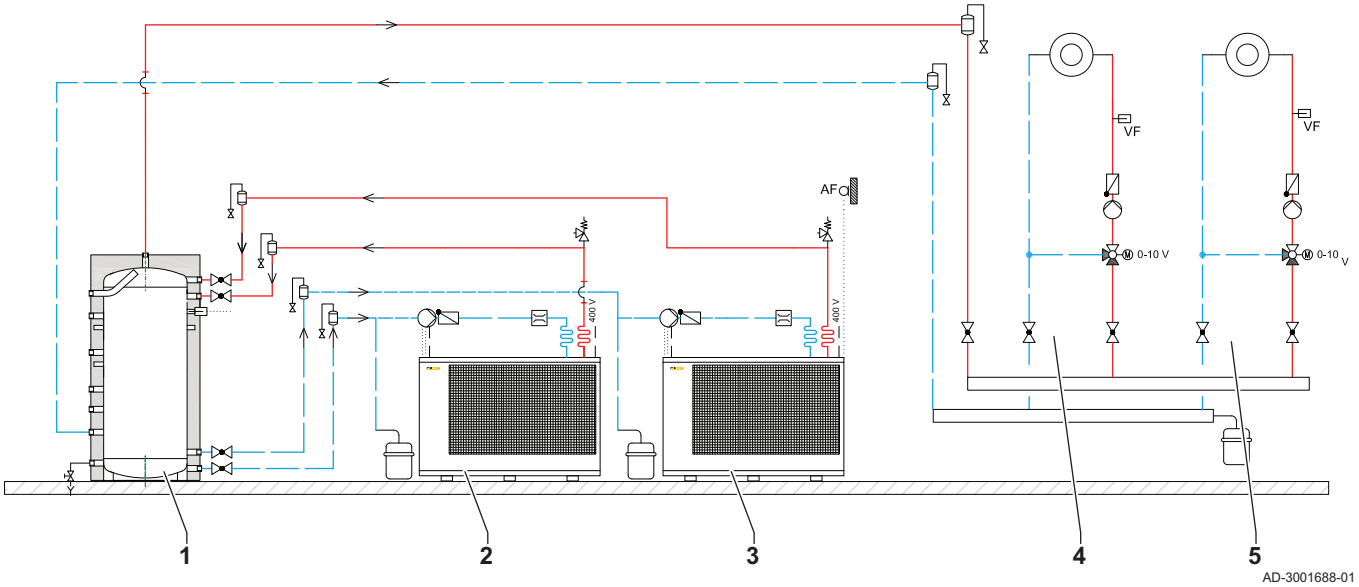
In case a low supply temperature during cooling mode is required (<15°C), an external 4-way valve must be placed in the installation to ensure that the heat exchanger will remain operating in counterflow.

4.2.3 Hydraulic scheme

- The installer is responsible for the design of the hydraulic installation.
- We advice to connect the heat pumps to a buffer that has a capacity of 15 L/kW.
- As air in the system can lead to serious damages we also advice to install adequate venting capabilities in the return line to the installation.
- Each heat pump needs to be secured with flow protection. This is to protect the installation in case the flow is restricted and goes under the required minimum flow.

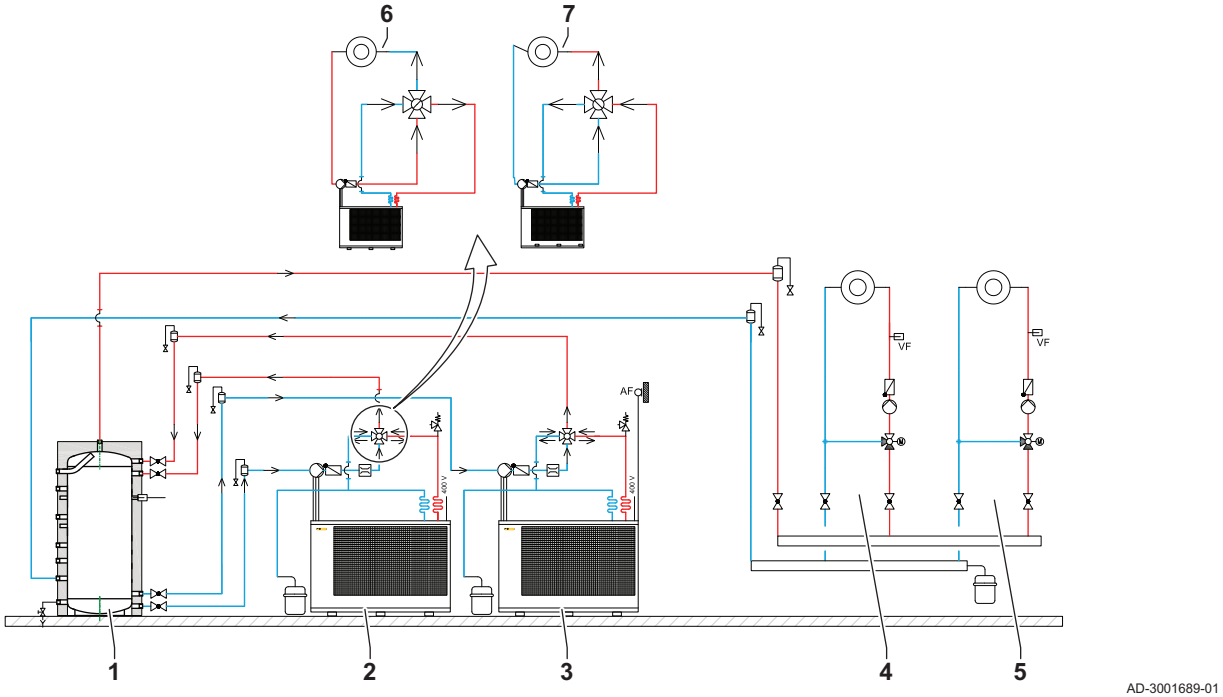
Below are two examples of a hydraulic scheme with an E-HP AW. For other examples of hydraulic schemes, contact BAXI

Fig.8 Example hydraulic scheme



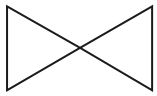
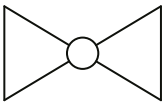
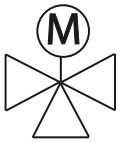
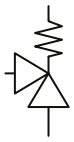
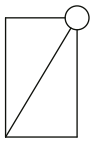
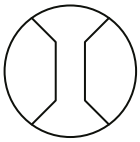
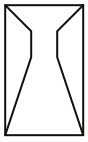
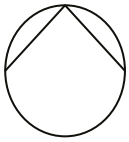
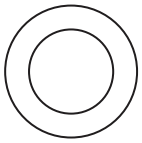
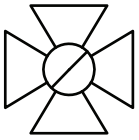
1 Buffer tank heating / cooling
2 Heat pump BAXI E-HP AW
3 Heat pump BAXI E-HP AW
4 Heating group 1
5 Heating group 2

Fig.9 Example hydraulic scheme



1 Buffer tank heating / cooling
2 Heat pump BAXI E-HP AW
3 Heat pump BAXI E-HP AW
4 Heating group 1
5 Heating group 2
6 Cooling position
7 Heating position

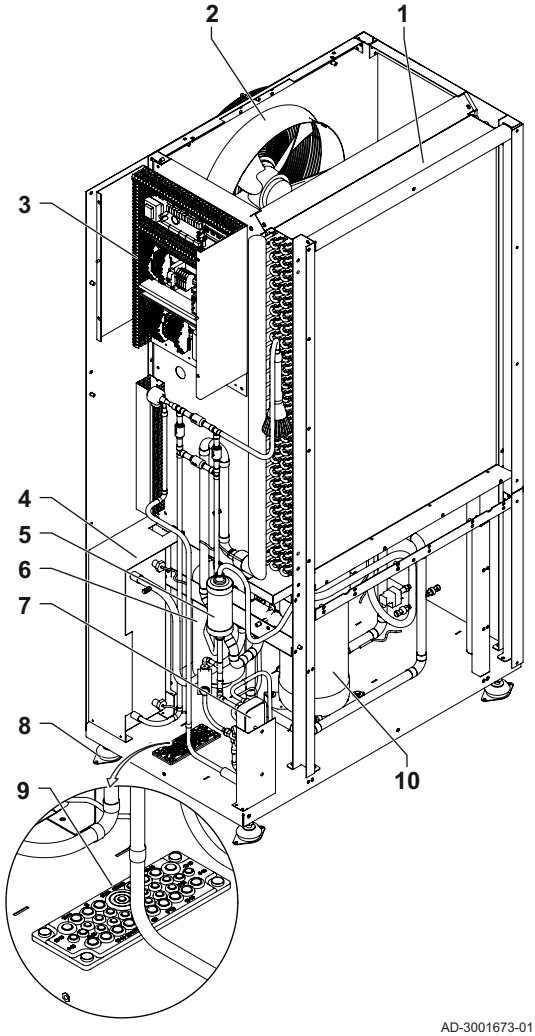
Tab.33 Hydraulic components

Symbol	Explanation	Symbol	Explanation
	Valve		Ball valve
	3-way valve, motor controlled		Valve, spring loaded
	Non-return valve		Flow switch
	Filter		Flow controller
	Pump		Flexible line
	Heat consumer		Low loss header
	4-way valve		

4.3 Main components

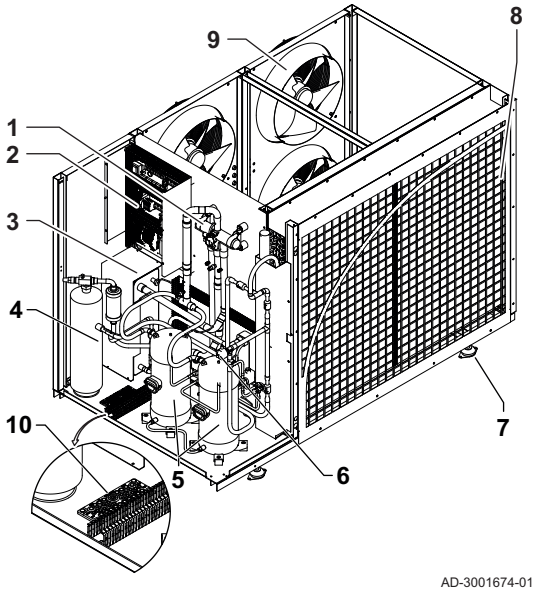
4.3.1 General overview

Fig.10 General overview 44



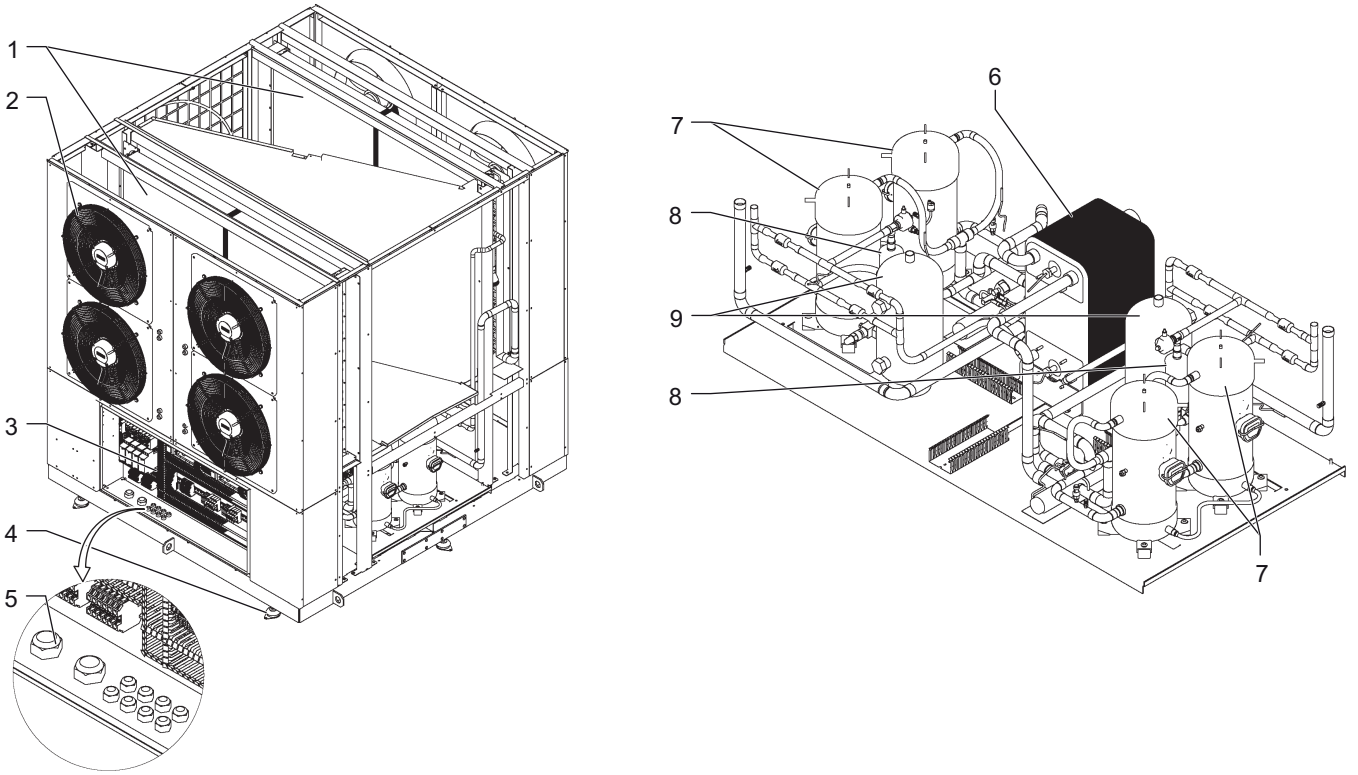
1 Evaporator
2 Inlet fan
3 Electrical cabinet
4 Condenser
5 Filter dryer
6 Refrigerant tank
7 EVI heat exchanger
8 Foot with vibration damper
9 Cable feed-through
10 Compressor

Fig.11 General overview 88



1 4-way valve
2 Electrical cabinet
3 Condenser
4 Refrigerant tank
5 Compressor
6 Expansion valve
7 Foot with vibration damper
8 Evaporator
9 Inlet fan
10 Cable feed-through

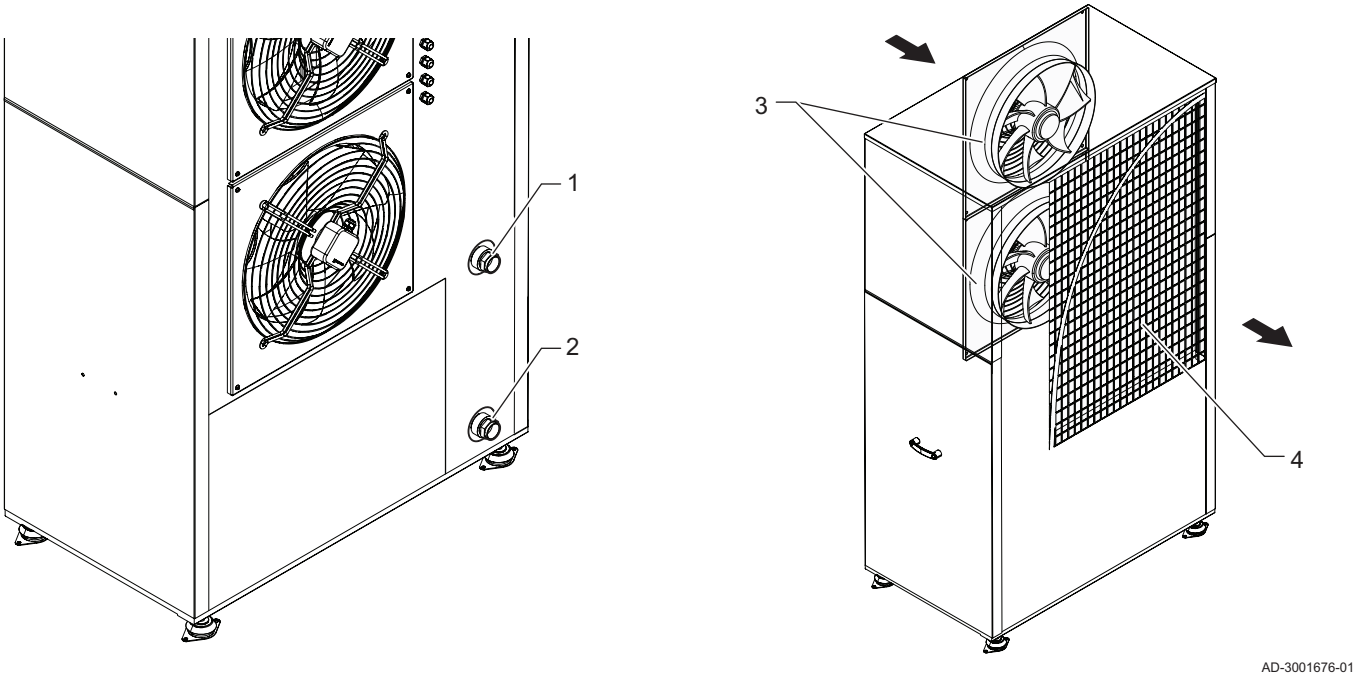
Fig.12 General overview 168



1 Evaporator
2 Inlet fan
3 Electrical cabinet
4 Foot with vibration damper
5 Cable feed-through
6 Condenser
7 Compressor
8 Filter dryer
9 Refrigerant tank

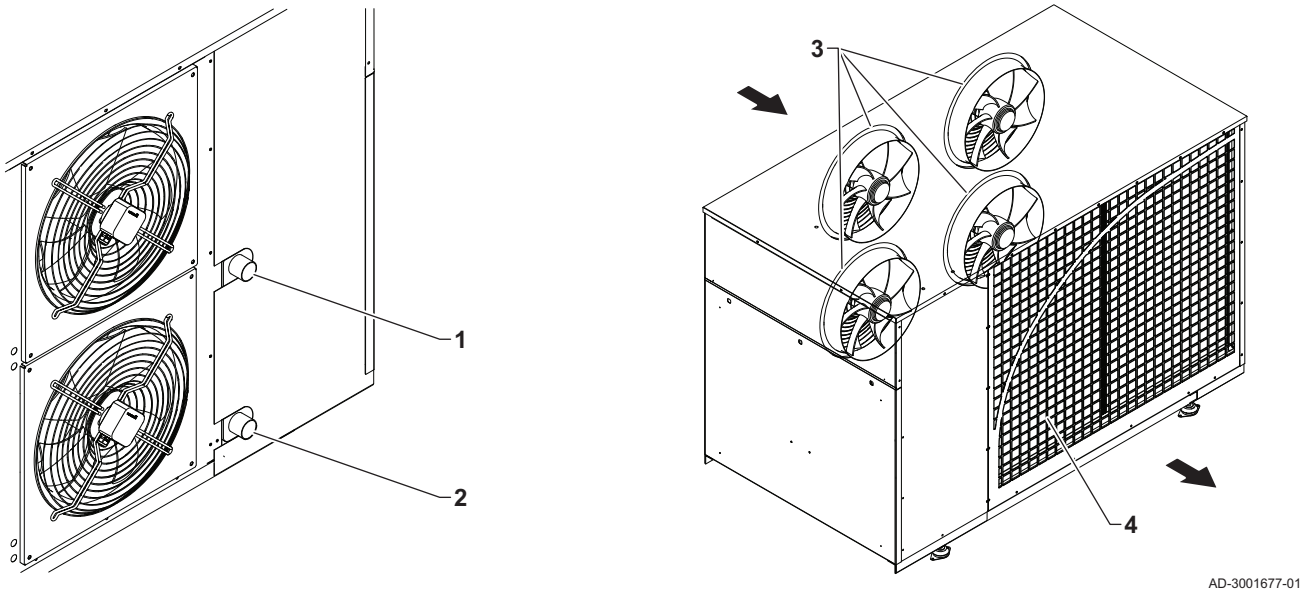
4.3.2 Overview of the air and water flow

Fig.13 E-HP AW 44



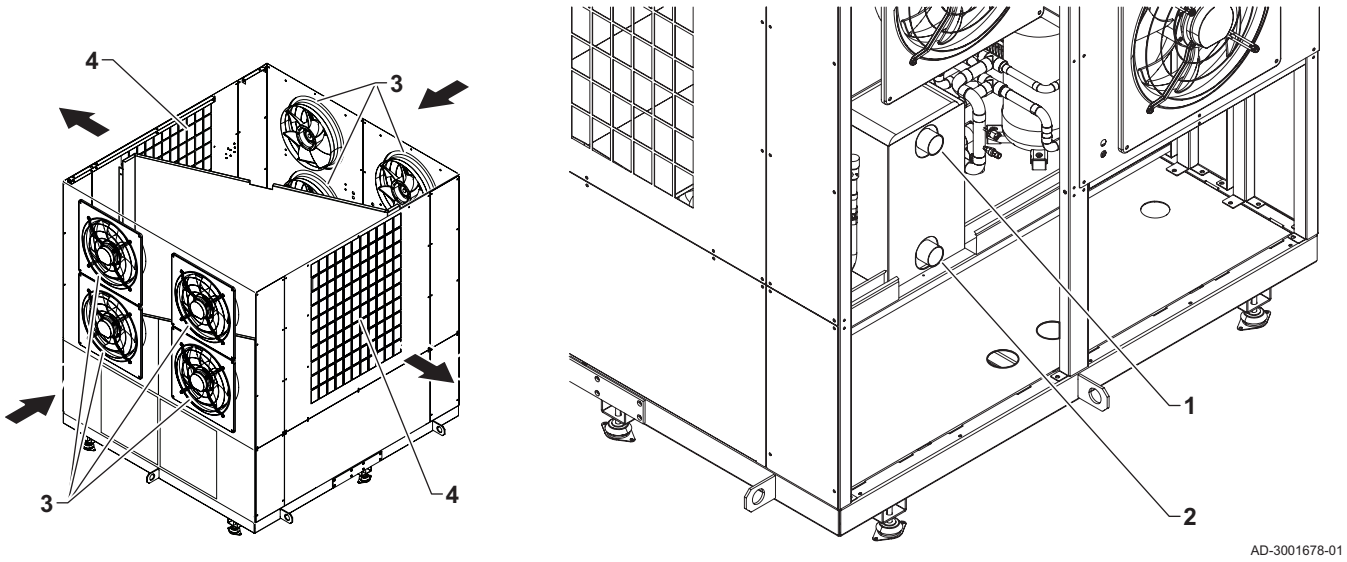
1 Heating supply
2 Heating return
3 Air in
4 Air out

Fig.14 E-HP AW 88



1 Heating supply
2 Heating return
3 Air in
4 Air out

Fig.15 E-HP AW 168



1 Heating supply
2 Heating return
3 Air in
4 Air out

5 Before installation

5.1 Choice of the location

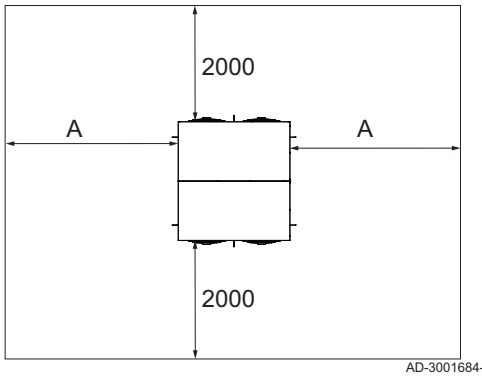
Important
Please consult a construction engineer before deciding the preferred location of the heat pump. The heat pump needs to be placed on a surface that can carry the weight, and that will not transfer any vibrations of the heat pump. An engineer can also be of help in preventing the transmission of sound throughout a building.

For planning and dimensioning of the installation space, consider:

- The surface must meet the following requirements:
  - The surface must be level.
  - The construction must be suited for the weight of the appliance.

- Make sure that there is enough free space between the heat pump and walls or fences, to secure that the air flows freely and to allow access for maintenance work.
- The appliance can function up to (and above) 1000 m above sea level.
- Make sure the appliance is accessible for safe operation and maintenance purposes.
- The control box of the heat pump must not be:
  - More than 1.9 m above service level.
  - More than 0.6 m below service level.
- It is advised to install the appliance with the air inlet towards the downwind position. This allows for correct defrosting of the evaporator.
  - If the appliance is positioned free-standing, wind influence can cause differences in operation characteristics. Therefore we advice to place the unit in line with the airflow over the appliance.
- Consider the noise emission while selecting the location for the appliance.
- Consider that a condensate drainage may have to be installed.

Fig.16 Installation area



A 1.5 m (3 m for the E-HP AW 168)

See also
Connecting the condensate drain, page 31

5.2 Preparing the location

Caution
Use UV and bird pecking resistant materials for insulation that is in the open air.

The installation site must be equipped with the following electrical connections and heating pipes:

Item	Amount	Specification
Connection cable for the compressor(s)	1 (2 for 168 kW)	3 / N / PE ~ 50 Hz / 400 V
Connection cable for the controller	1	1 / N / PE ~ 50 Hz / 230 V

Important
The necessary cross section of the cable depends on the power consumption of the device and the length of the cable.

Item	44	88	168
Heating supply (external thread)	1 1/2"	2"	2 1/2"
Heating return (external thread)	1 1/2"	2"	2 1/2"

1. Create a trench or install a cable tray to lead the necessary cables and pipes from the building to the device.
   If a trench of at least 80 cm deep is made, no insulation of the cables is needed.
2. Lead the cables and the pipes through a protective tube.
   Use flexible tubing to prevent transmission of machine sounds.

3. Insulate the heating pipes to avoid heat loss.
   Make sure to use anti-condensation insulation in the case of a heat pump with the Cool module.
   The heat pump is protected against freezing by circulating the water from the buffer tank when the heat pump is not running. If the heat pump is switched off during winter or if there is a risk of a power outage, take precautions to avoid the risk of freezing of the external pipework and the plate heat exchanger in the device. Drain the device or use a mix of water and anti-freeze in the pipework.
4. If necessary, install a condensate drainage.
   This pipe does not have to be installed in the trench or cable tray with the other cables and pipes.

See also
Connecting the condensate drain, page 31

5.3 Transport

Caution

- Transport and move the appliance in the upright position at all times to secure the correct working of the refrigerant and the compressor.
- Do not tilt the appliance. A maximum tilt of 15° is allowed, but only for a short period of time.
- Make sure the appliance is protected against shocks. Severe shocks can damage the shock absorbers of the compressor.
- Use the means of transportation suited for the weight of the appliance.
- Do not step under the hovering load.
- Always use hoisting cables suited to carry the weight of the appliance.
- When storing the appliance, make sure the ambient temperatures in the storage room are between -23 °C and 55 °C.

5.3.1 Forklift

Use a forklift to move the pallet with the device to its location.

Important
Make sure to use a forklift with long forks that protrude the edges of the pallet or the floor-size of the machine. Keep the centre of gravity in mind when moving the device to prevent unwanted tipping.

1. Check on which side of the heat pump the lift side indication is placed.
2. Drive the forks under the unit from that side.
3. Secure the heat pump against falling down.
4. Carefully lift and move the device.
5. Carefully place the device at the desired location.

5.3.2 Crane

Use a crane to lift and move the device.

Important
Make sure to use a crane with a crane traverse, and a 4-point crane cross head.

1. Attach the clamping strap to the frame of the device.

Fig.17 Crane attachment for the 44

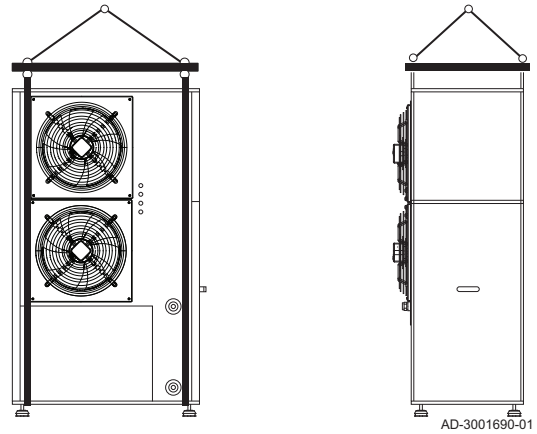


Fig.18 Crane attachment for the 88

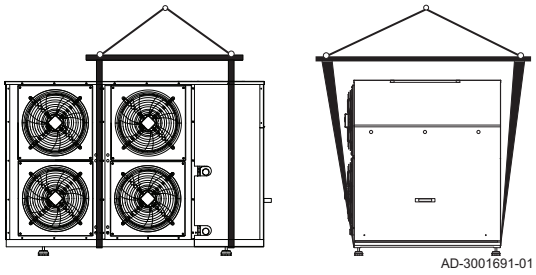
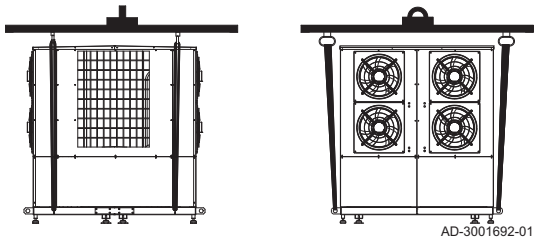


Fig.19 Crane attachment for the 168



1.1. Mind the centre of gravity of the device. See the illustrations for the exact attachment locations.
2. Carefully lift and move the device.
3. Carefully place the device at the desired location.

5.4 Unpacking & initial preparation

5.4.1 Install the foundation

Install a base or frame as a foundation for the device. The base or frame must meet the following requirements:

- The base or the frame must have holes to connect to the bottom of the device or machine feet, depending on type and situation.
- The top of the frame, or the foundation for the machine must be smooth and even.
- The top of the foundation must be level, and higher than the expected snow height, to keep the bottom of the machine snow free at all times.
- The stability of the foundation must be selected according to the local conditions, as well as according to the maximum capacity load.

For correct installation of the heat pump, it is recommended to get advice of an expert for the main support construction. The expert can also advise on avoiding contact noise to adjacent residential areas.

5.4.2 Install the control panel

The control panel is included. It is pre-wired to the device with a cable with a length of 10 meter. Install the control panel inside the building.

See
For basic parameters, see the control panel manual.

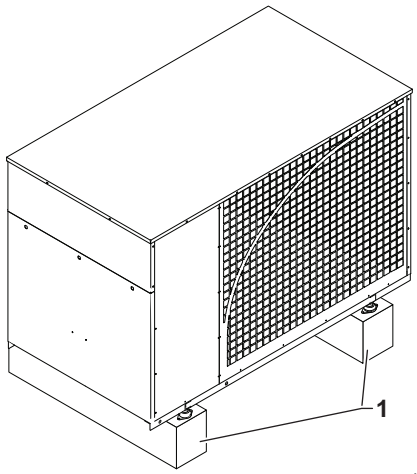
6 Installation

6.1 Preparation

6.1.1 Mounting the device

Important
The machine feet come standard with the machine. When it needs to be installed on a frame, remove the feet and use the openings for mounting the machine on the frame.

Fig.20 Mounting the device



1 Frame

1. Mount the device on the base or the frame.
2. Use bolts and nuts to fasten the device to the base or the frame.

See also
Transport, page 28

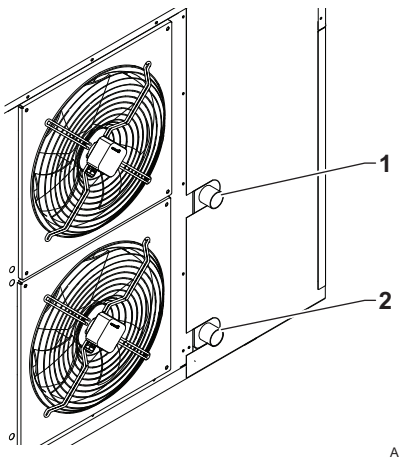
6.2 Hydraulic connections

6.2.1 Connecting the supply and return pipes.

Make sure to use flexible pipes or vibration absorbers to avoid the transmission of vibrations to the pipework.

Caution
- Use UV and bird pecking resistant insulation materials for insulation that is in the open air.
- Use condensate resistant insulation materials for a device with active cooling.
- Use a 4-way valve when the heat pump is used for cooling and a low cooling flow temperature is required. This allows a reverse flow over the heat exchanger.

Fig.21 Connections



1. Flush the device before connecting the heating pipes.
2. Install ball valves at the pipe connections 1 and 2 to facilitate disconnecting the device for service.
3. Connect the heating supply pipe to the device at 1.
4. Connect the heating return pipe from the device at 2.
5. Measure if there is a sufficient flow over the condenser with the appropriate equipment.
6. Install a flow switch, to prevent that the heat pump is operated without water flow.

   ⇨ **Caution**
   When there is no flow, switching on the heat pump will lead to severe damage to the heat pump.
7. Install a filter and an air bleeder to prevent air or dirt entering the heat exchanger.
8. Insulate the pipes

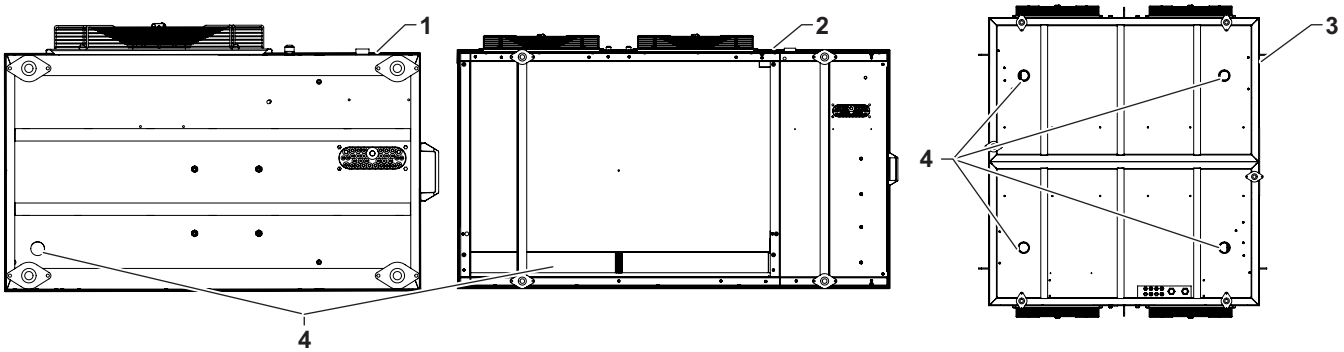
Caution
Ensure that the temperature difference between supply and return is 5 - 7 K, in order to reach the values in the data sheet and to avoid disturbances. This implies larger flows, larger pipe cross sections and corresponding pump designs.

6.2.2 Connecting the condensate drain

A condensate drain is provided to ensure that the condensate is drained properly from the appliance.

Depending on the installation location of the heat pump, further draining of the condensate may be necessary. The available drainage may be insufficient, for example because it leads the water to a walkway, possibly causing dangerous situations in the case of frost. It is also possible that excess ice will accumulate on the roof, possibly exceeding the maximum allowable load the roof. If this is the case, take necessary measures for further condensation drainage.

1. Connect one end to the available drain at the bottom of the device.
2. The other end may be connected to the rainwater drain, as the water is clean.
3. Install heat tracing to prevent the drain from freezing.



AD-3001694-01

1 E-HP AW 44
2 E-HP AW 88
3 E-HP AW 168
4 Condensate drain

6.3 Electrical connections

6.3.1 Connecting the electrical cables

Caution
- Always check that the electrical system of the building is capable of handling the starting current of the device and has the correct circuit breakers.
- Use UV and bird pecking resistant materials for insulation that is in the open air.

Make sure that a qualified electrical engineer installs the electrical connection of the device.

1. Install a mains switch to the device in accordance with the applicable standards and local regulations.

Important
Failure to connect the mains-switch and power cable in the correct fashion is not covered by warranty. This is the responsibility of the installer.

Fig.22 Entry electrical cables 44

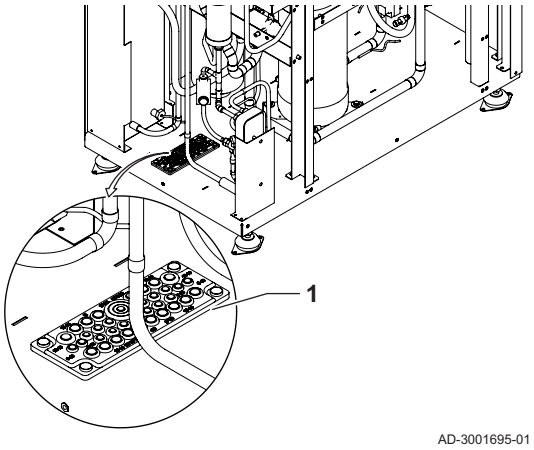


Fig.23 Entry electrical cables 88

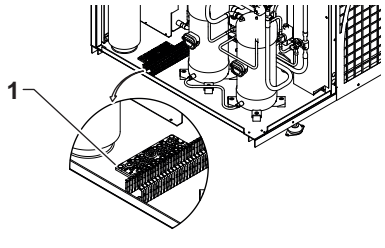
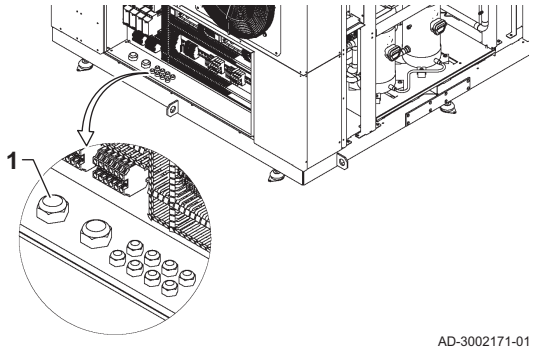


Fig.24 Entry electrical cables 168



2. Lead the main electrical cables through the holes (1).
3. Connect the electrical cables.
   3.1. Make sure that the phases are connected in a right-rotating field in the phase order: L1, L2, L3.
   3.2. In case of an extension of the sensor cable, it is necessary to use a shielded cable with a cross section of at least 0.75 mm^2.
   3.3. Do not install the sensor cable together with the mains power cables.
4. Connect the controller cable to the device.
   4.1. Use one, or if necessary several, separate external main switches upstream to the terminal box to be able to separate the device completely from the network.
5. If applicable, connect the heat tracing cables of the condensate drainage.
6. Insulate the cables.

See also
Electrical connections, page 13

6.4 Filling the system

6.4.1 Filling the system

Caution

- The heating circuit must have a sufficient water flow to operate the heat pump. Insufficient or no hot water flow can lead to high pressure failures in heating mode and low pressure failures in defrost mode. If this happens, the system will be switched off by either the high pressure limiter or the low pressure limiter. Wrong settings on the controller can have a similar effect.
- When filling the hydraulic system, please make sure the water temperature in the system is above 10°C, and the ambient temperature is above 0°C. The machine will not start when the water in the system is under 10°C to protect itself.

Important
Failures in the heat pump are mostly caused by hydraulic operation conditions and lack of water flow over the condenser. If a malfunction is displayed, it is often to protect the heat pump. It is generally not a sign of a defective heat pump.

1. Install a flow switch to make sure that there is sufficient flow before you start the heat pump.
2. Install a fitting for filling and rinsing in the heating circuit.
3. Fill the buffer, if applicable.
4. Fill the heating circuit.
5. When filling the heating circuit, leave time for accumulated air to escape the system.
6. Close the filling and draining valve.
7. If the heat pumps are installed in a location higher than the heating system, install proper air bleed devices, preferably in the return line to the heat pump. This prevents a lack of flow due to air in the installation.

7 Commissioning

7.1 Check list before commissioning

Check if all the following steps are done before commissioning the device:

- The heating circuit is flushed, filled and deaerated.
- A free flow of water in the system is guaranteed.
- The condensation drainage is installed.
- The compressor is connected with a right rotating field.
- The fans are rotating in the correct direction (pushing air into the machine).
- The space near the air inlet and air outlet is free.
- The settings of the flow switches are adjusted properly to the device.
- All electrical connection cables are connected and protected.
- All screws are tightened.
- The heating system is protected against freezing.
- The main switch is set to ON.
- The earth conductor resistance and the isolation resistance should be tested for compliance with local rules and regulations. The tests must be repeated according to the intervals applicable on site or according to the local rules and regulations about commissioning and recommissioning.
  Use a PE conductor of at least 10 mm^2 cross section.

7.2 Commissioning procedure

7.2.1 Bleeding the system

The hydraulic system must be pressurized to 2 bar, and importantly: there must be no air in the system. Before operating the heat pump, fill the hydraulic system to the appropriate pressure, and make sure all the air has bled from the system. The heat pump is ready for use when the system pressure is correct and all the air has escaped from the system.

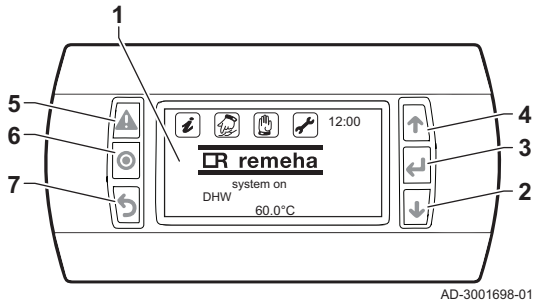
8 Operation

8.1 Use of the controller

Use the controller to commission and operate the device. The controller can be installed inside near the building switching board or near the heat pump as long as it is weather protected.

To operate active cooling, see the manual of the controls.

Fig.25 Controller



Tab.34 Controller button description

	Item/button	Description
1	Display	After 5 minutes without interaction, the display and operating buttons dim automatically.
2	Scroll down / - operating button	Use to scroll down in the menu and to decrease values.
3	Select / Confirm / Enter operating button	Use to select a menu item and to confirm a value change and save.
4	Scroll up / + operating button	Use to scroll up in the menu and to increase values.
5	Alarm menu button	The alarm menu button has a LED that flashes red when faults are pending. The LED is permanently on for faults which have been viewed but not reset. Press this button to reset the alarm message.
6	On / Off button	This button switches the control function on/off, not the device power supply. The LED lights up when the controller is switched off.
7	Exit / Cancel / Escape operating button	Use to exit a menu or menu items and to cancel a value change without saving.

On the main screen, icons of the four main menus are shown. Use the "up" and "down" buttons to scroll through the menus. The currently selected icon has inverted colours. Use the "select" button to enter the selected menu.

Tab.35 Icon description

Icon	Menu functions
	**Information** Main menu for automatic control of the heat pump system: • Display the currently measured values. • Display the system status. • Display the history (system message memory). • Display the operating hours.
	**Program** Change and adjust the programmable setting values: • Setpoint in heating, cooling, and hot water mode. • Day/week program for heating, cooling, etc. • Set date and time • Service information
	**Manual mode** Switch the connected pump, valves and generators on and off in manual mode. **Important** This should only be done by qualified personnel, as this will put all functions of the controller out of operation.
	**Basic settings** Information on the basic settings for the functioning of the system. Several sub menus are available. **Important** Password-protected settings and changes may only be made by qualified personnel.

8.2 Starting the module active cooling

Important
Water flow in the system must be guaranteed before starting the machine.

if the appliance is capable of active cooling, use the controller to start the module.

At the first start-up of the active cooling, make sure that the following items are available:

- A sufficient flow in the heating circuit.
- Heating water of at least 25 °C.

Caution
If there is insufficient flow and heat in the heating circuit, there is a risk of freezing of the heat exchanger. This risk occurs if the device operates in cooling mode unintentionally during start-up. This can cause damage to the heat exchanger.

9 Maintenance

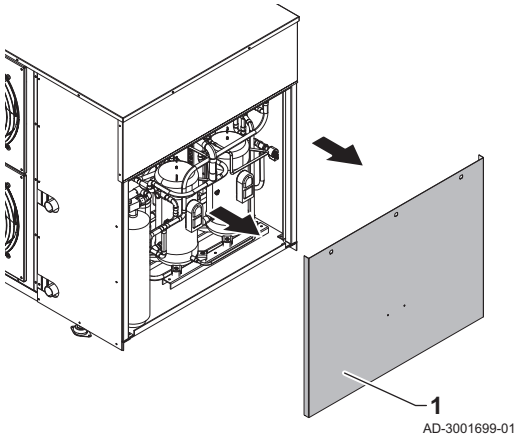
9.1 Getting access

Determine on which side of the device the maintenance has to be performed and remove the appropriate side cover.

Danger
Make sure that the device and the connection box are switched off before opening the covers.

9.1.1 Accessing the heating side

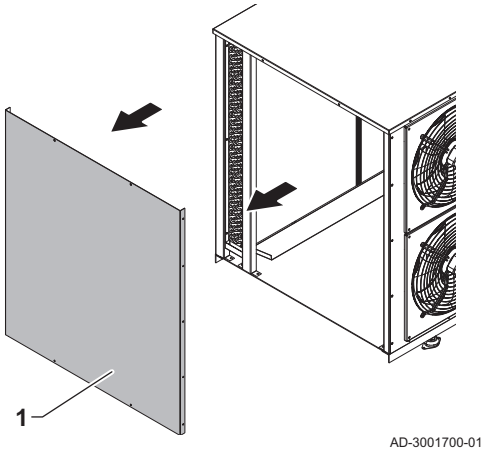
Fig.26 Removing cover heating side of the 44 / 88 / 168



1. Remove the screws that attach the cover (1) to the device.
2. Remove the side cover (1).

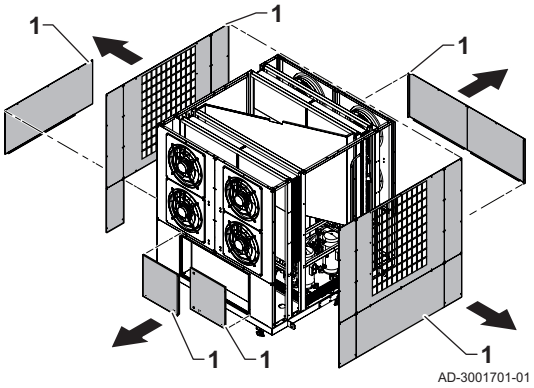
9.1.2 Accessing the air side

Fig.27 Removing cover heating side of the E-HP AW 44 / 88



1. Remove the screws that attach the cover (1) to the device.
2. Remove the side cover (1).

Fig.28 Removing cover heating side of the E-HP AW 168



9.2 Standard inspection and maintenance operations

Important
Maintenance must be performed by a qualified technician.

See also
Personnel qualification, page 5

9.2.1 Performing a leak test

Warning
Always make sure that the device is disconnected from the power supply before opening and cleaning the device.

The leak test should be performed by qualified personnel only.

In accordance with the F-gas regulation, a yearly leak test must be performed. If the heat pump is fitted with an automatic leak detection device (available as accessory) the leak test interval frequency can be decreased to once every 2 years.

1. Remove the side cover of the heating side.
2. Perform the leak test.
   The amount of refrigerant can be found on the type plate.
3. Document the outcome of the leak test in the log.
   Refer to the F-gas regulation for information on how long the outcomes should be kept.
4. Install the side cover.
5. Tighten the screws to attach the side cover.
6. Turn the power back on.

See also
Accessing the heating side, page 35

9.2.2 Cleaning the heating circuit

Flush the condenser regularly with a flushing device. The heating water can get contaminated by oxidation products, remainders of lubricants and sealants. If these substances enter the heating circuit, they can reduce the performance of the condenser in the device.

Danger
Always make sure that the device is disconnected from the power supply before opening and cleaning the device.

Warning
Parts and fluids may be hot.

1. Connect the flushing device directly to the supply and return pipes of the condenser of the heat pump.
2. Flush the condenser contrary to the direction of flow.
   2.1. Install a filter to keep the heat exchanger clean and to avoid failures.
3. Reattach the supply and return pipes, to both heat exchangers.
4. Make sure the water pressure in the system is at the required level.
5. Bleed all air from the system.
6. Install the side cover.
7. Install the screws to attach the side cover.
8. Turn the power back on.

See also
Accessing the heating side, page 35

9.2.3 Cleaning the air side

Caution
Always keep the air entry/suction area and air exhaust area free of ice and snow, to make sure there is sufficient air volume.

Important
- Clean the fans, evaporators and condensate drainage at the beginning of each heating period.
- Check the condensate collector regularly and clean it if necessary, to guarantee proper draining.

Warning
Always make sure that the device is disconnected from the power supply before opening and cleaning the device.

1. Remove the side cover of the air side.
2. Clean the inner side of the heat pump.

Caution
Do not use sharp or hard objects, to avoid damage to the evaporator and the condensate pan.

3. Install the side cover.
4. Install the screws to attach the side cover.
5. Turn the power back on.

See also
Accessing the air side, page 36

9.2.4 Cleaning the exterior

Caution
Do not use any cleaning agents containing soda, acids, sand or chlorine in order to protect the surface.

1. Clean the external parts of the device with a damp cloth and common detergents.

10 Troubleshooting

10.1 General

Danger
- Installation, maintenance and repairs must always be done by an qualified technician in accordance with local legislation.
- Always disconnect the device from the power source when you perform maintenance.
- Do a check of the complete installation for leakages after service or maintenance.
- Remove casings only for maintenance and service. Replace all casings after maintenance or service.
- Use only the fuse supplied or an identical fuse in case of a defect fuse.
- Use only original spare parts.

Caution
Always replace all gaskets carefully of all dismounted parts during maintenance.

10.2 Errors

- If an error occurs, an error code will be displayed on the controller of the device.

See
Refer to the controller manual for explanation of the error codes.

- If you cannot solve the problem, inform an approved installer or service technician.
- Additional information is available upon request at the BAXI service desk.

Errors which are not displayed on the controller can be checked using the following table. If the error cannot be solved, contact the installer or service technician.

Fault	Possible cause	Solution
Display is not functioning	There is no mains power	Switch on or connect the controller
		Inspect the house fuse for the connection
	The device is malfunctioning	Consult the installer
Controller is not working	The controller is in manual mode	Exit the **Manual** menu
	The switch-on condition is not fulfilled	Wait until the switch-on condition is fulfilled
The displayed temperature fluctuates wildly at short intervals	The sensor lines are routed close to 230V cables	Route the sensor cables in a different way and shield the sensor lines
	There are long sensor lines without shielding	Shield the sensor lines
	The device is malfunctioning	Consult the installer
	There is a loose sensor cable	Re tighten the sensor cable

11 Decommissioning

11.1 Temporary decommissioning

1. Turn the power switch to 'OFF'.
2. Drain the water of the heating circuit if the outside temperature is under 0 °C to avoid freezing. Freezing of the water in the supply and return pipes may damage the device.

12 Disposal

12.1 Disposal and recycling

Fig.29

MW-3000179-03

Caution
Removal and disposal of the heat pump must be carried out by a qualified technician in accordance with local and national regulations.

Important

- The heat pump has electrical and electronic components. In case of improper disposal, they might have adverse effects on the environment. We specifically point out that the device must not be disposed of as domestic waste, but that it is necessary to dispose of it as hazardous waste.
- Environmentally relevant requirements with regard to recycling, reuse and disposal of fuels and components according to the common standards must be complied with. It is particularly important to ensure a professional disposal of the refrigerant and compressor oil (FV86).

1. Disconnect the power supply of the heat pump.
2. Disconnect the cables of the electrical components.
3. Close the water valves.
4. Drain the installation.
5. Remove all water connections that are installed at the outlet of the heat pump.
6. Remove and recycle the heat pump in accordance with local and national regulations.

13 Spare parts

13.1 Exploded views

For more information, see https://www.baxi.co.uk/trade/boilers-parts-and-accessories/parts/parts-arena.

Fig.30 E-HP AW 44 (Cool) Ace

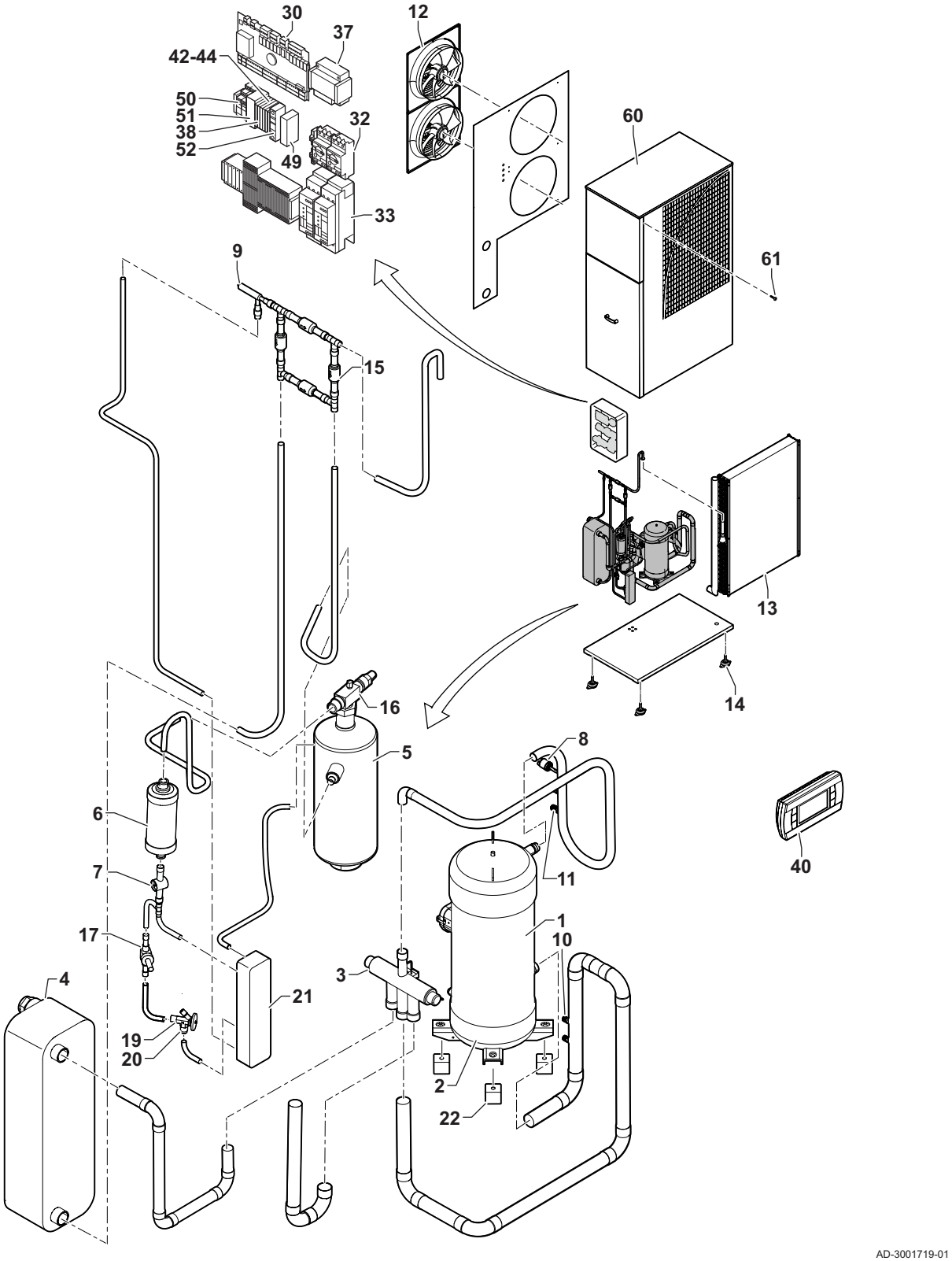


Fig.31 E-HP AW 88 (Cool) Ace

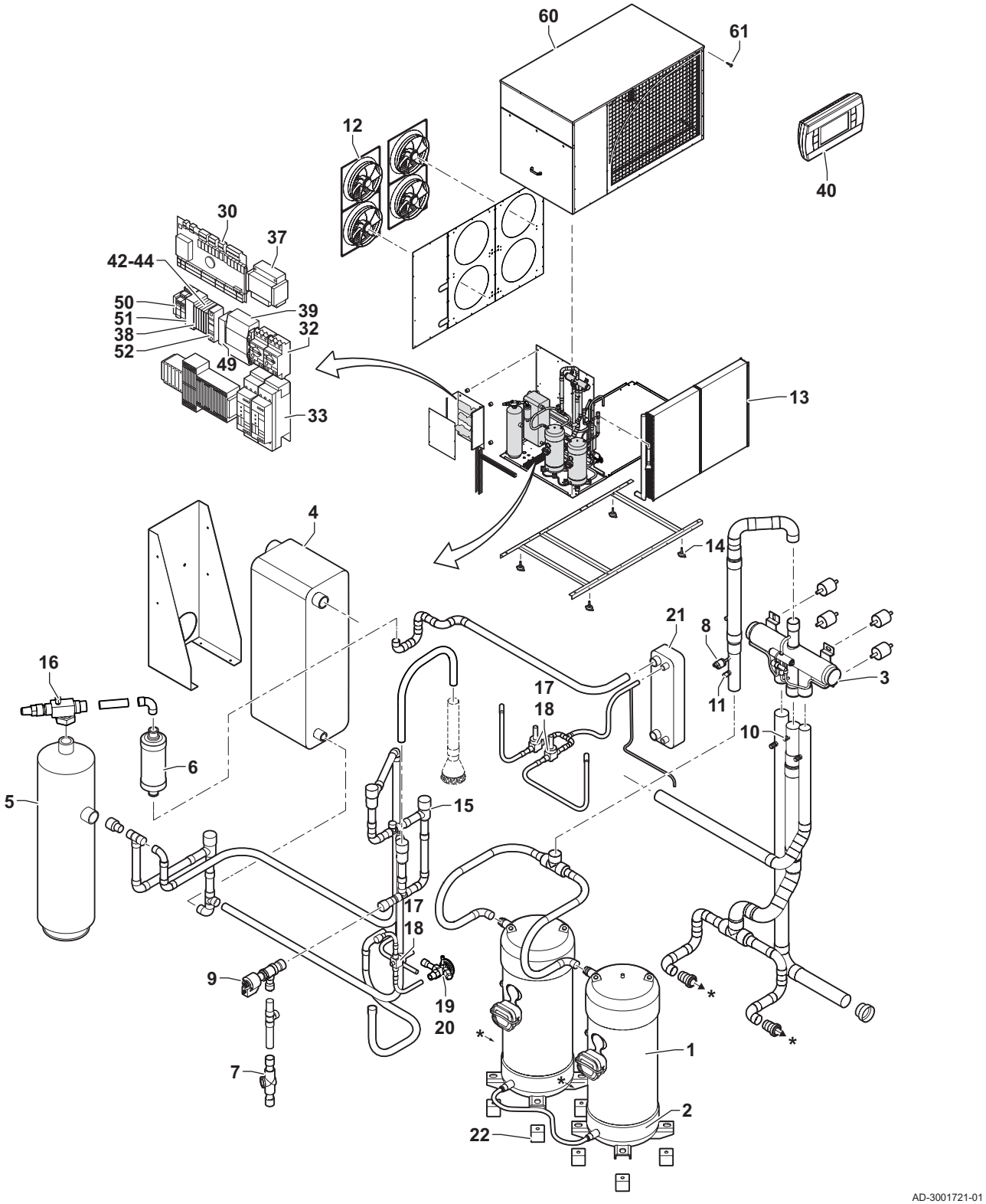
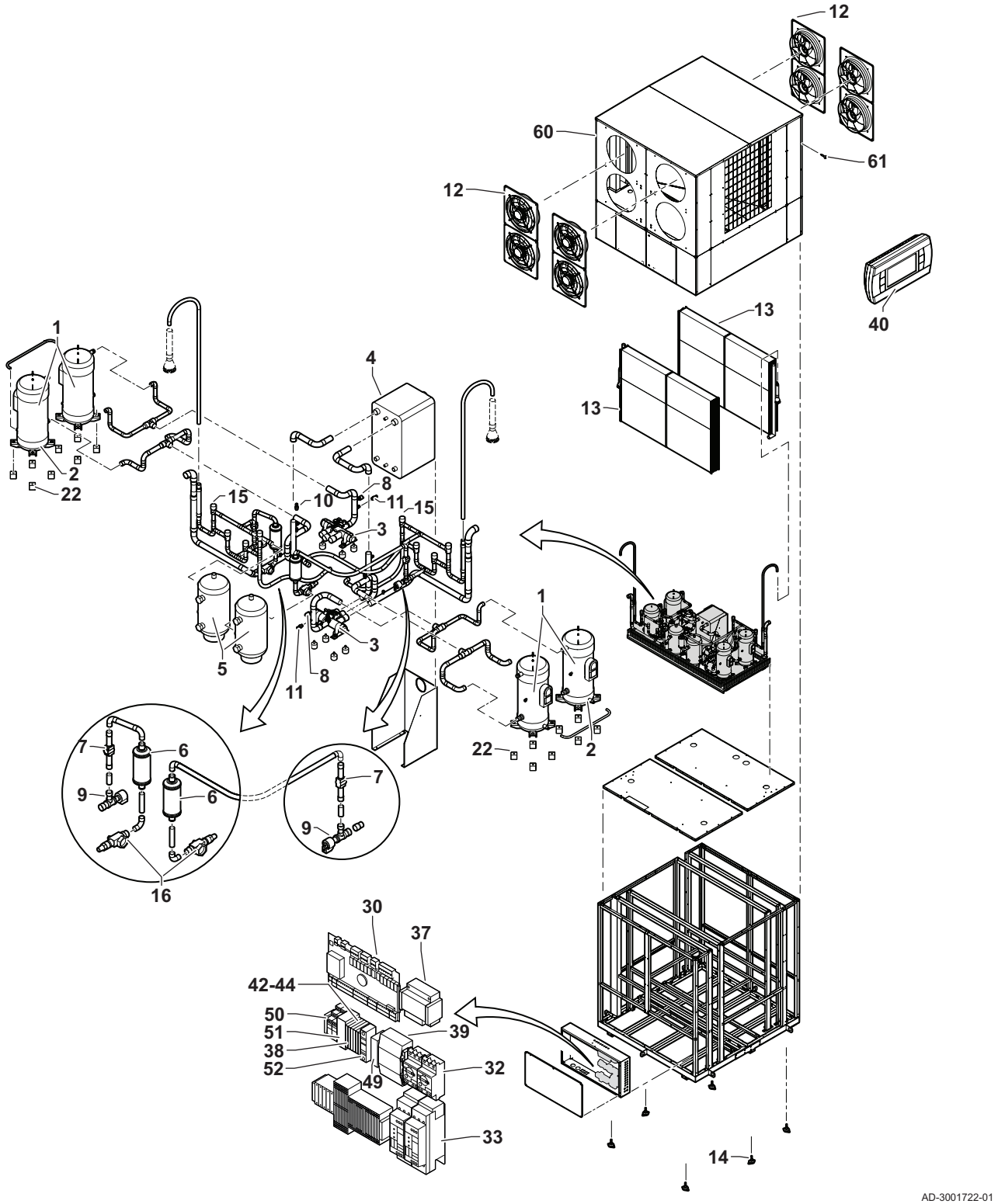


Fig.32 E-HP AW 168



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