

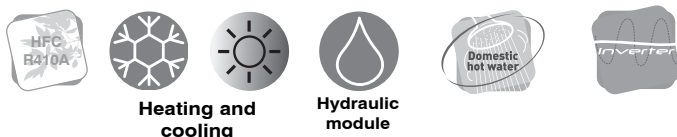


Air-to-water reversible heat pumps

Ready-to-operate *package*
State-of-the-art *technology*
for greater *comfort*



Heating capacity: 5 to 14 kW
Cooling capacity: 4 to 13 kW



USE

AQUALIS INVERTER air-to-water reversible heat pumps are ideal for heating and air conditioning of houses and flats. They may be used with a wide selection of indoor terminal units.

When used for heating alone, they can supply heat to an underfloor heating system, low-temperature radiators or high-temperature radiators if paired with a boiler, depending on the bivalence point.

When used for heating and cooling, they may be combined with:

- A conventional network of fan coil units (Major 2, ceiling cassette units, ductable water-cooled unit).
- An underfloor heating and cooling system.
- A mixed system comprising, for example an underfloor heating and cooling system downstairs and fan coil units upstairs.

RANGE

The AQUALIS INVERTER range is made up of two sizes of units: a 33H unit with a capacity of 5 to 12 kW, and a 44H unit with capacity of 5 to 14.5 kW. Both can be adjusted to best match building loads, thereby increasing comfort and economising both energy and money.

The units are designed to deliver heat at outdoor temperatures as low as -20°C.

An auxiliary heating source such as an electric loop heater, boiler or even wood (fireplace, stove) must be used in areas

where the outdoor temperatures are lower.

They can also be used to provide indoor cooling at outdoor temperatures of down to +15°C.

- Two AQUALIS REVERSIBLE DC INVERTER models: 33H and 44H.
- One compressor and refrigeration circuit.
- Alternate or simultaneous operation with a boiler.

DESCRIPTION

Standard equipment:

- DC INVERTER SCROLL compressor.
- Stainless-steel brazed plate water-cooled heat exchanger.
- Coil made of copper tubes and aluminium fins.
- Propeller fans.

Speed adjusted to outdoor temperature levels for all-season operation in both heating and cooling mode.

Control:

Microprocessor-controlled control unit with two-wire Microconnect remote control.

Hydraulic circuit with circulator.

UV-stabilised recyclable plastic casing.

- Meets EN 60-335 and EN 378-2.
- Meets the following European directives:
EMC (89/336/EEC)
PED (97/23/EC) -> category 1.



Air-to-water reversible heat pumps

AQUALIS INVERTER

QUICK SELECTION

AQUALIS INVERTER		33H			44H		
		Minimum	Nominal	Maximum	Minimum	Nominal	Maximum
35°C	Heating capacity +7°C	5.3	10.2	11.9	5.3	12.2	14.5
	COP	3.79	4	3.72	3.53	3.81	3.92
	Heating capacity -7°C	3.5	6.6	10.5	3.3	7.3	11.4
	COP	2.7	2.68	2.28	2.36	2.32	2.11
45°C	Heating capacity +7°C	4.9	9.9	10.2	5.1	11.4	12.4
	COP	3.07	3.14	2.68	3	3.04	2.76
	Heating capacity -7°C	3.3	6.3	10.3	3.1	7.2	10.6
	COP	2.1	2.1	1.87	1.83	2.03	1.63
55°C	Heating capacity +7°C	4.7	9.3	10.54	4.8	10.7	12.6
	COP	2.47	2.48	2.33	2.4	2.35	2.38
	Heating capacity -7°C	3.1	6.4	9	2.9	6.5	9.3
	COP	1.72	1.94	1.3	1.53	1.76	1.13
Energy rating		A			B		
Supply voltage		230 V - 1 - 50 Hz					
Sound level dB(A) (1)		37	46	47	37	48	49

(1) 5 m from unit, 1.5 m from floor, directivity 2 ± 3 dBA at 10°C

COMPOSITION

Hermetic compressor

- DC INVERTER rotary scroll compressor. Two scrolls (one fixed and one orbiting).
- Built-in electric motor cooled by suction gas.
- Motor protected by internal winding sensor.
- Noise insulation.

Water-to-refrigerant heat exchangers

- Brazed plates.
- AISI 316 stainless steel intermediate and end plates.
- High-performance, optimised plate patterns.
- Thermal insulation.

Air-cooled heat exchanger

- Bent coil, copper tubes and aluminium fins.

Standard components

- Reversing valve.
- Suction accumulator.
- Liquid tank.
- Electronic expansion valve.
- Dryer.
- Crankcase heater.

Electrical panel

- Box conforms to EN 60335 standard.
- Main earth connection.
- Electronic control unit with microprocessor:
 - Uses a water law to adjust the hot water or chilled water temperature based on the outdoor temperature.
 - Boiler backup mode: automatically runs the heat pump and boiler, either alternately or simultaneously, using a setting that can be adjusted based on the outdoor temperature.
 - Monitors the operating and safety settings.

- Displays the temperatures on the terminal.
- Air setpoints in comfort unit and RFHC mode.
- Controls the unit.
- Two-wire remote-control terminal. ON/OFF input control (two inputs, automatic/load shedding, heating - cooling/absence).
- 5-minute short-cycle protection.
- Optimised defrosting.

Control and safety unit

- High-pressure safety switch.
- Pressure sensors (HP/LP).
- Two frost sensors (exchanger water outlet and exchanger refrigerant outlet).
- Water sensors on exchanger water inlet and outlet.
- Coil sensor.
- Outdoor sensor.
- Suction sensor.

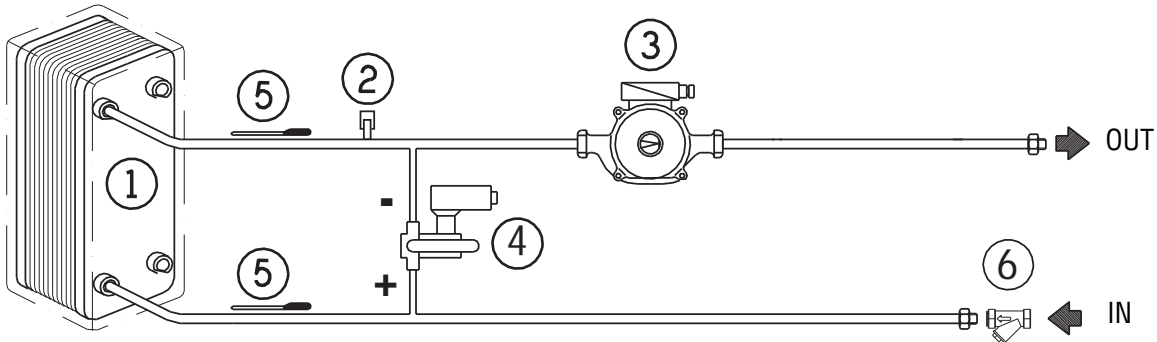
Built-in hydraulic module

- Safety valve set at 4 bar.
- Manual air bleed valve.
- Multispeed circulator.
- Differential water pressure switch.

Accessories (option) (for installation on site)

- Insulated hose assemblies.
- Anti-vibration mounts.
- Screen filter with ball valve kit.
- Filling kit.
- Loop heater.

HYDRAULIC MODULE PRINCIPLE DIAGRAM



- ① Brazed-plate heat exchanger
- ② Automatic air bleed valve
- ③ Circulator
- ④ Differential pressure switch
- ⑤ Temperature sensors
- ⑥ Screen filter (accessories)

OPERATING LIMITS

Chilled water production

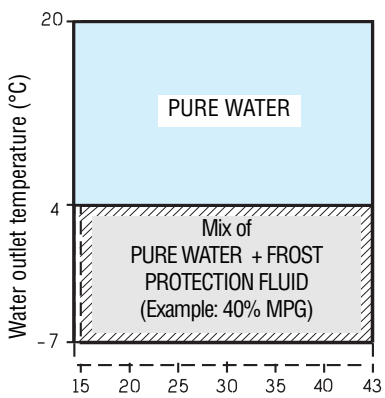
Maximum water return temperature during operation: +40°C

Hot water production

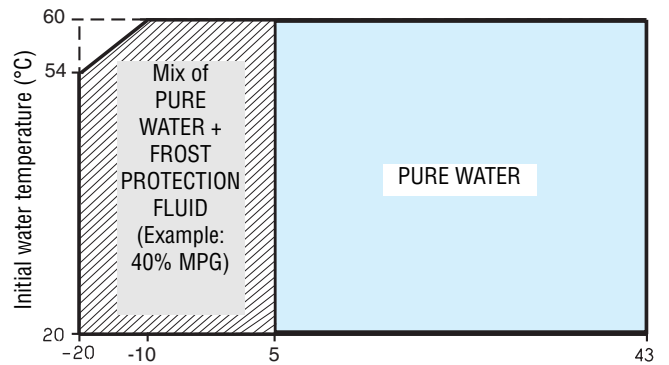
Minimum water return temperature for warm-up:

Frost protection fluid: +5°C / Pure water: +10°C

Maximum water inlet temperature: +70°C



Outdoor air temperature in °C (DB)



Outdoor air temperature in °C (DB)

Required water flow rate

AQUALIS INVERTER	33H	44H
Minimum flow rate (m³/h)	1.4	1.4
Nominal flow rate, cooling mode (m³/h)	2.1	2.4
Nominal flow rate, heating mode (m³/h)	1.8	2.1



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AQUALIS INVERTER

HEATING CAPACITIES

Aqualis Inverter	Outdo or air temp. °C	underfloor heating system								fan coil unit				radiator				cast iron radiator				
		25°C				35°C				45 °C				55 °C				60 °C				
		Pi nom	Hc nom	Pi max	Hc max	Pi nom	Hc nom	Pi max	Hc max	Pi nom	Hc nom	Pi max	Hc max	Pi nom	Hc nom	Pi max	Hc max	Pi nom	Hc nom	Pi max	Hc max	
kW																						
33H	-20	2.0	4.6	2.0	4.6	2.3	4.5	2.3	4.5	2.9	4.4	2.9	4.4	-	-	-	-	-	-	-	-	-
	-15	2.0	5.3	3.1	8.0	2.3	5.3	3.8	7.8	3.0	5.2	4.6	7.6	3.0	5.0	4.1	7.6	-	-	-	-	-
	-10	2.0	6.3	3.6	10.1	2.4	6.1	4.5	10.0	3.0	5.9	5.4	9.8	3.2	5.3	4.2	8.3	3.3	6.2	4.5	7.8	-
	-5	2.1	7.2	3.7	11.1	2.5	6.9	4.7	11.3	3.0	6.7	5.6	10.8	3.2	6.0	4.3	8.6	3.7	6.8	4.7	9.1	-
	0	2.1	8.0	3.7	11.5	2.5	7.8	4.8	11.8	3.0	7.6	5.7	11.2	3.6	7.4	4.4	9.3	3.9	7.3	4.7	9.3	-
	5	2.1	9.4	2.7	11.9	2.5	9.2	3.1	11.4	3.1	9.0	3.7	10.5	3.7	8.3	4.4	10.1	4.1	8.3	4.7	9.9	-
	10	2.1	11.1	2.7	13.5	2.6	10.9	3.2	13.2	3.2	10.6	3.8	12.2	3.8	9.8	4.5	11.5	4.1	9.5	4.9	11.3	-
	15	2.1	12.5	2.7	15.5	2.6	12.2	3.2	15.0	3.2	11.8	3.9	14.0	3.9	11.0	4.6	13.0	4.2	10.5	4.9	12.5	-
	20	2.1	14.4	2.8	17.5	2.7	13.5	3.3	16.5	3.3	12.9	4.0	15.9	3.9	12.1	4.6	14.4	4.3	11.6	5.0	13.8	-
44H	-20	2.4	5.1	2.4	5.1	2.9	5.1	2.9	5.1	3.0	5.0	3.0	5.0	-	-	-	-	-	-	-	-	-
	-15	2.4	5.9	3.9	9.7	2.9	5.9	4.6	8.8	3.5	5.8	5.4	9.3	3.5	6.0	4.9	9.0	-	-	-	-	-
	-10	2.5	7.2	4.1	10.5	3.1	6.8	5.3	10.4	3.5	6.7	6.1	10.3	3.7	6.3	5.0	9.6	3.4	6.6	5.5	9.1	-
	-5	2.6	8.1	4.4	12.1	3.2	7.9	5.4	12.0	3.6	7.6	6.5	11.6	3.7	6.8	5.1	10.0	3.8	7.6	5.5	9.9	-
	0	2.6	9.4	4.4	13.2	3.2	8.7	5.5	12.8	3.7	8.5	6.6	11.8	3.8	8.0	5.2	10.6	4.1	8.5	5.6	10.5	-
	5	2.6	11.0	4.4	14.0	3.2	11.0	3.6	13.0	3.7	10.2	4.4	11.9	4.5	9.5	5.2	11.4	4.9	9.8	5.7	11.1	-
	10	2.6	13.0	4.4	16.9	3.2	12.8	3.7	15.0	3.8	12.2	4.5	14.0	4.6	11.4	5.4	13.0	4.9	10.8	5.9	12.6	-
	15	2.6	15.1	4.5	19.0	3.2	14.7	3.7	17.1	3.8	13.6	4.6	16.1	4.7	12.8	5.5	15.1	5.0	12.2	6.0	14.7	-
	20	2.7	17.3	4.5	21.1	3.3	16.6	3.8	19.1	4.0	15.5	4.7	18.5	4.8	14.4	5.5	17.0	5.2	13.6	6.1	16.1	-

COOLING CAPACITIES

Aqualis Inverter	water outlet temp.	20°C				25°C				30°C				35°C				40°C				43°C			
		Cc nom	Pi nom	Cc max	Pi max	Cc nom	Pi nom	Cc max	Pi max	Cc nom	Pi nom	Cc max	Pi max	Cc nom	Pi nom	Cc max	Pi max	Cc nom	Pi nom	Cc max	Pi max	Cc nom	Pi nom	Cc max	Pi max
		kW																							
33H	5	9.6	2.3	11.1	2.7	9.3	2.5	10.8	3.0	9.0	2.7	10.2	3.3	8.4	3.0	9.6	3.5	7.9	3.2	8.9	3.9	7.5	3.4	8.5	4.0
	7	10.3	2.3	11.8	2.8	10.0	2.5	11.4	3.0	9.5	2.8	10.9	3.3	9.0	3.0	10.3	3.6	8.5	3.3	9.5	3.9	8.0	3.4	9.0	4.1
	10	11.1	2.3	12.9	2.8	10.9	2.6	12.4	3.1	10.4	2.8	11.9	3.4	9.8	3.1	11.2	3.7	9.1	3.3	10.4	4.0	8.7	3.5	9.9	4.2
	15	13.0	2.4	14.9	2.9	12.5	2.6	14.5	3.2	12.0	2.9	13.7	3.5	11.3	3.1	12.9	3.8	10.6	3.4	12.0	4.1	10.1	3.6	11.4	4.3
	18	14.1	2.4	16.2	2.9	13.7	2.7	15.6	3.2	13.1	2.9	14.8	3.6	12.3	3.2	13.9	3.9	11.5	3.5	12.9	4.2	10.9	3.6	12.3	4.4
	20	14.9	2.4	17.2	3.0	14.5	2.7	16.5	3.3	13.9	3.0	15.6	3.6	13.1	3.2	14.6	3.9	12.1	3.5	13.6	4.3	11.5	3.7	13.0	4.4
44H	5	10.7	2.9	12.2	3.3	10.6	3.1	11.9	3.7	10.1	3.4	11.3	4.0	9.4	3.7	10.6	4.4	8.8	4.0	9.8	4.7	8.4	4.2	9.3	4.9
	7	11.5	2.9	12.9	3.4	11.1	3.2	12.5	3.7	10.6	3.5	11.9	4.1	10.1	3.8	11.3	4.4	9.4	4.1	10.5	4.8	9.0	4.3	10.0	5.0
	10	12.5	2.9	14.2	3.4	12.3	3.2	13.7	3.8	11.7	3.5	13.1	4.1	11.0	3.8	12.3	4.5	10.3	4.2	11.5	4.9	9.8	4.4	10.9	5.1
	15	14.6	3.0	16.5	3.5	14.2	3.3	15.8	3.9	13.5	3.6	15.0	4.3	12.7	4.0	14.2	4.7	11.9	4.3	13.2	5.0	11.4	4.5	12.5	5.3
	18	16.0	3.0	17.9	3.6	15.5	3.3	17.2	4.0	14.8	3.7	16.4	4.4	13.9	4.0	15.3	4.7	13.0	4.4	14.3	5.1	12.3	4.6	13.6	5.4
	20	16.9	3.1	18.9	3.6	16.3	3.4	18.2	4.0	15.5	3.7	17.3	4.4	14.6	4.0	16.2	4.8	13.6	4.4	15.0	5.2	13.0	4.6	14.4	5.5

Pi = Power input for compressor + control + fan(s)
Hc = Heating capacity

Cc = Cooling capacity
Power consumption level calculations include defrosting cycles

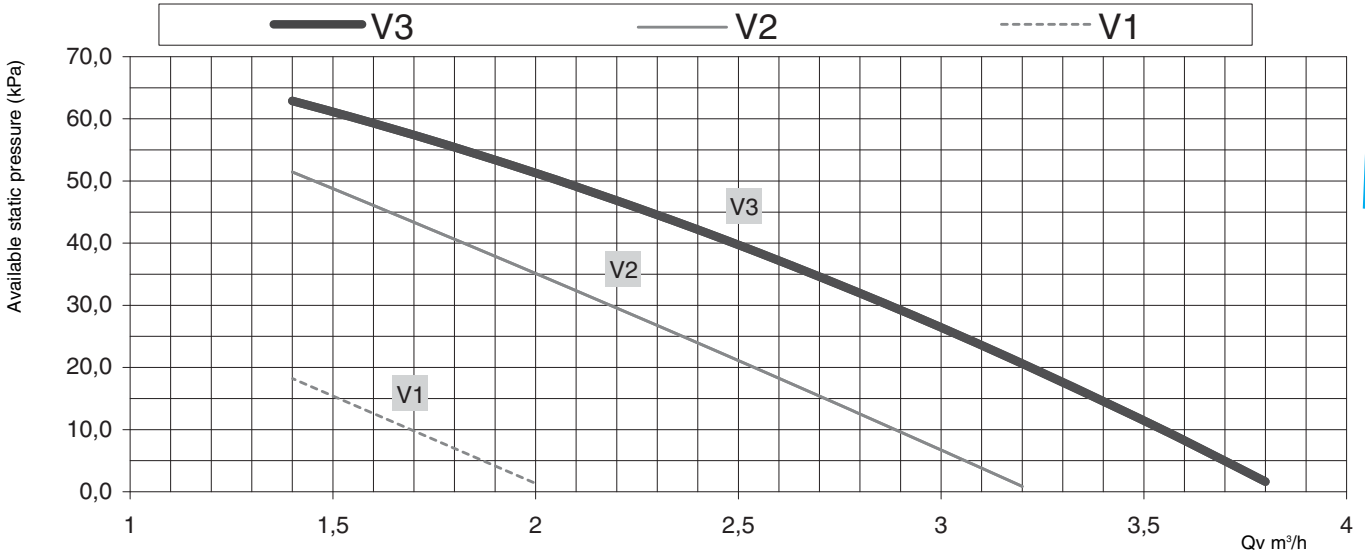


Air-to-water reversible heat pumps

PUMP SPECIFICATIONS

Available pressure in system

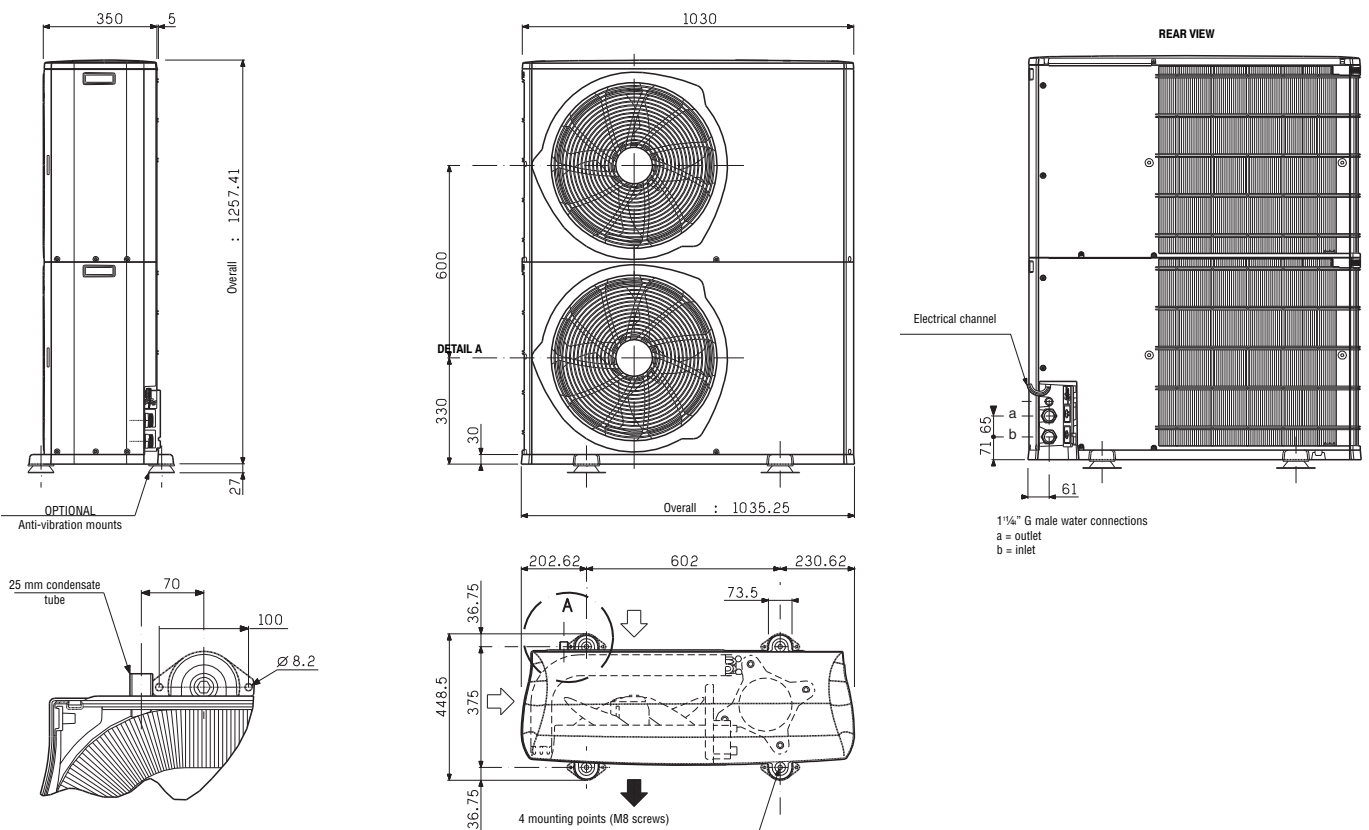
AQUALIS INVERTER 33H - 44H



The available pressure curves are given for pure water.

Subtract 5 kPa from the available pressures in the case of systems using 40% monopropylene glycol (heating mode).

DIMENSIONS





Air-to-water reversible heat pumps

AQUALIS INVERTER

TECHNICAL CHARACTERISTICS

AQUALIS INVERTER		33H	44H	
Compressor	Quantity	1		
	Type	DC INVERTER SCROLL		
	Oil capacity	1.7	POE oil (MEL 56)	
Crankcase heater	W	45		
Refrigerant		R410A		
Refrigerant weight	kg	2.99		
Coil type		Grooved copper tubes with aluminium fins		
Water-cooled HEX	Water capacity	1.6		
	Type	Propeller		
Fan	Quantity	2		
	Speed	rpm	640/400	700/450
	Circulator		3 speeds	
Hydraulic module	Maximum service pressure	bar	4	
	Maximum system capacity: pure water / 40% glycol solution with 5 l expansion vessel (not supplied)*	L	330/190	
	Minimum pure water capacity of system for smooth running of your unit	L	80	
Weight	Empty	kg	144	
	In operation	kg	147	

* A higher capacity expansion vessel is needed for larger volumes

SOUND LEVELS*

AQUALIS INVERTER		33H	44H
Sound pressure levels	dB (A)	37 to 47	37 to 49

* 5 metres from unit, 1.5 metres from ground, in a free field, directivity 2

ELECTRICAL CHARACTERISTICS

AQUALIS INVERTER		33H	44H	
Rated voltage of unit		230 V - 1-ph+N+Earth - 50 Hz		
Compressor	maximum operating current	A	30.5	31
Fans	maximum operating current	A	0.47 x 2	0.74 x 2
Circulator	unit power	min	115	
	unit power	max	210	
	rated current	min	0.6	
	rated current	max	1	
Max. current of entire unit	A	33	34	
Starting current	A	< 5		
Electrical wiring not supplied (1)	mm ²	3G10		
C or D curve circuit breaker (not supplied)	Am	40		
Thermostat, pool sensor, On/Off input connections	mm ²	0.2 - 1		
Control circuit connection kit	mm ²	1		

(1) PVC cable for temperatures below 45°C and a maximum length of 30 m.

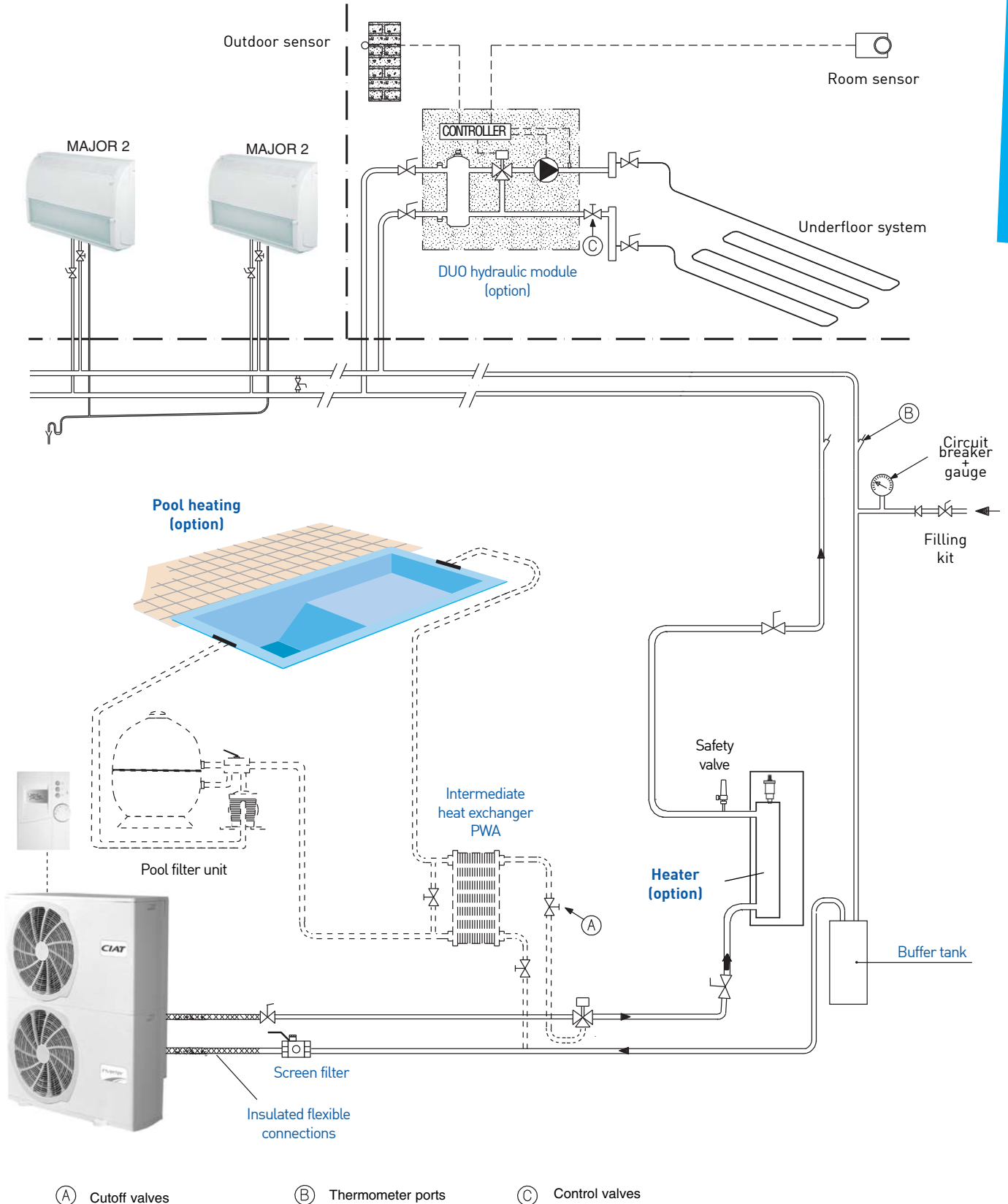
Note: for other conditions, refer to French standard NF C 15-100 or the relevant prevailing standard in the country of installation.



Air-to-water reversible heat pumps

SCHEMATIC INSTALLATION DIAGRAM

Residential comfort units and/or underfloor heating and cooling system



Note: The schematic diagrams herein are provided for information only. Under no circumstances do they constitute actual installation diagrams.



Air-to-water reversible heat pumps

INSTALLATION ADVICE

Location

AQUALIS INVERTER units are designed to be installed outdoors on a home deck/patio or in a garden.

- Nothing should obstruct the air flow over the coil or the fan discharge.
- Carefully consider where to install the unit and choose a location appropriate for the surrounding environment (sound levels, integration on site, etc.).
- Sufficient clearance should be left around the unit to allow for connections, servicing and maintenance.

Electrical connections

All the information needed to wire the system is provided on the wiring diagram supplied with the unit. The diagram should be followed to the letter.

Wiring must be carried out in accordance with accepted engineering practice and conform to the regulations in force.

A cut-off switch and circuit breaker must be installed on the consumer unit by the fitter.

NOTE: To protect the unit from freezing temperatures, leave it on to allow the water to continue flowing through the water circuit. Add glycol if the outdoor temperature falls below 0°C.

Hydraulic connections

Hydraulic connections are to be made in accordance with good engineering practice.

To prevent transmitting noise through the ground or pipes, we recommend using flexible hydraulic connections and placing anti-vibration mounts under the unit.

- Install a screen filter with a maximum particle size of no more than 600 µm on the water circuit to protect the plate exchanger from fouling.

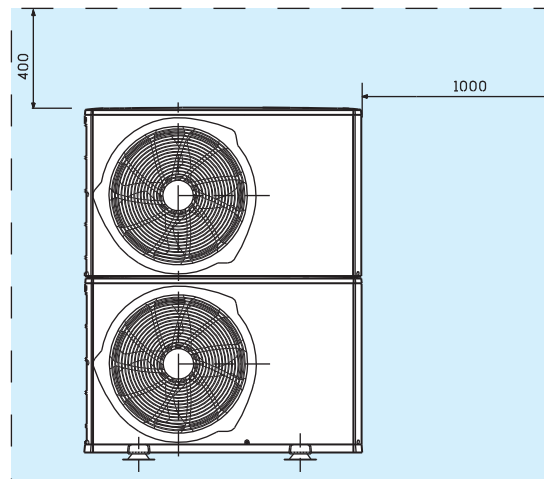
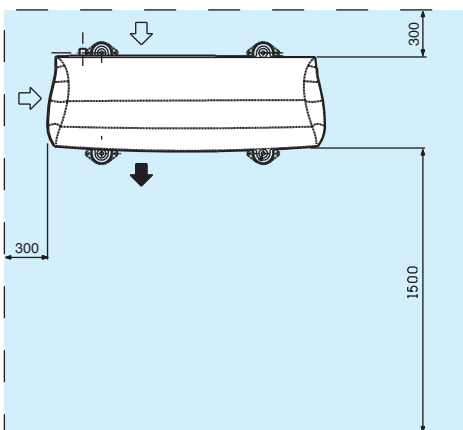
Commissioning

- Follow the instructions given in our installation and maintenance manuals.

Maintenance

- Follow the owner's manual.
- Take out a maintenance contract.

Clearance to be left around the unit (mm)



This document is non-contractual. As part of its policy of continual product improvement, CIAT reserves the right to make any technical modification it feels appropriate without prior notification.

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