



EN

Air/water chillers and heat pumps with axial-flow fans with and without pump assemblies

**r** HFC  
R-410A

**BRAT2 0021÷0121**  
**BRAN2 0021÷0121**

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The following symbols are used in some parts of this publication and inside the unit:

<b>U</b>	User		Important		Danger high temperatures
<b>I</b>	Installer		Prohibition		
<b>A</b>	Assistance		Danger voltage		



The manufacturer reserves the right to modify the data in this manual without warning.

**ENVIRONMENTAL INFORMATION:** This unit contains fluorinated greenhouse gases covered by the Kyoto Protocol. The maintenance and disposal operations must only be carried out by qualified personnel.

**⚠ These appliances have been designed** to chill and/or heat water and must be used in applications compatible with their performance characteristics; these appliances are designed for residential or similar applications. Incorrect installation, regulation and maintenance or improper use absolve the **manufacturer** from all liability, whether contractual or otherwise, for damage to people, animals or things.

Only those applications specifically indicated in this list are permitted

**Read this manual carefully.** All work must be carried out by qualified personnel in conformity with legislation in force in the country concerned.

**The warranty is void** if the above instructions are not respected and if the unit is started up for the first time without the presence of personnel authorised by the Company (where specified in the supply contract) who should draw up a "start-up" report.

**The documents supplied with the unit** must be consigned to the owner who should keep them carefully for future consultation in the event of maintenance or service.

When the items are consigned by the carrier, check that the packaging and the unit are undamaged.

If damage or missing components are noted, indicate this on the delivery note. A formal complaint should be sent via fax or registered post to the After Sales Department within eight days from the date of receipt of the items.

All repair or maintenance work must be carried out by the Company's Technical Service or qualified personnel following the instructions in this manual.

Do not modify or tamper with the appliance as this may create situations of danger; in such cases the manufacturer of the appliance is not liable for any damage caused.

## WAIVER OF LIABILITY

This publication is the sole property of **Climaveneta**. Any reproduction or disclosure of such is strictly prohibited without the written authorisation of **Climaveneta**.

This document has been prepared with maximum care and attention paid to the content shown. Nonetheless, **Climaveneta** waives all liability deriving from the use of such document.

Read this document carefully.

All work must be performed, components selected and materials used professionally and in complete accordance with the legislation in force in material in the country concerned, and considering the operating conditions and intended uses of the system, by qualified personnel.

## FUNDAMENTAL SAFETY RULES

When operating equipment involving the use of electricity and water, a number of fundamental safety rules must be observed, namely:

**⚠ The unit must not be used** by children or by unfit persons without suitable supervision.

**Do not touch the unit** with bare feet or with wet or damp parts of the body.

**Never perform any cleaning operations** before having disconnected the unit from the mains power supply.

**Do not modify safety** or control devices without authorisation and instructions from the manufacturer.

**Do not pull**, detach or twist the electrical cables coming from the unit, even when disconnected from the mains electricity supply.

**Do not open doors or panels** providing access to the internal parts of the unit without first ensuring that the mains switch is in the off position.

**Do not introduce pointed objects** through the air intake and outlet grills.

**Do not dispose of**, abandon or leave within reach of children packaging materials (cardboard, staples, plastic bags, etc.) as they may represent a hazard.

**⚠ The BRAT/N2 0021+0121 appliances** are supplied without the main switch.

Power supply to the unit must be disconnected using a switch with suitable characteristics, to be supplied and installed by the installer.

**⚠ Respect safety distances** between the unit and other equipment or structures. Guarantee adequate space for access to the unit for maintenance and/or service operations (see the figure on page 5).

**Power supply:** the size of the electrical cables must be adequate for the power of the unit and the power supply voltage must correspond with the value indicated on the respective units. All units must be earthed in conformity with legislation in force in the country concerned.

**⚠ Some terminals in the electrical panel** may be powered even after the unit is disconnected.

Make sure power is not connected before proceeding.

**Water connections** should be carried out as indicated in the instructions to guarantee correct operation of the unit.

Add glycol to the water circuit if the unit is not used during the winter or the circuit is not emptied.

**Handle the unit** with the utmost care (see weight distribution table) to avoid damage.

The chillers are supplied accompanied by:

- installation, user and maintenance manual;
- CE declaration;

### CHOICE OF INSTALLATION SITE

Before installing the unit, agree with the customer the site where it will be installed, taking the following points into consideration:

- Check that the fixing points are adequate to support the weight of the unit;
- Pay scrupulous respect to safety distances between the unit and other equipment or structures to ensure that air entering the unit and discharged by the fans is free to circulate.

### HANDLING AND POSITIONING

The unit should always be handled by qualified personnel using equipment adequate for the weight of the chiller.

- Before handling the unit, check the capacity of the lift equipment used, respecting the instructions on the packaging.
- To move the unit horizontally, make appropriate use of a lift truck or similar, bearing in mind the weight distribution of the unit.

To lift the unit, insert tubes long enough to allow positioning of the lifting slings and safety pins in the special feet on the unit.

For the sizes of these tubes, see the figures shown in the corresponding section.

- To avoid the slings damaging the unit, place protection between the slings and the unit.

Position the unit in the site indicated by the customer. Place either a layer of rubber (min. thickness 10 mm) or vibration damper feet (optional) between the base and support surface.

Fix the unit, making sure it is level and that there is easy access to water and electrical components.

If the site is exposed to strong winds, fix the unit adequately using tie rods if necessary.

If a heat pump unit is being installed, make sure the condensate is drained using the drain hose supplied as standard.

Prevent leaves, branches or snow from accumulating around the unit. These could reduce the efficiency of the unit.

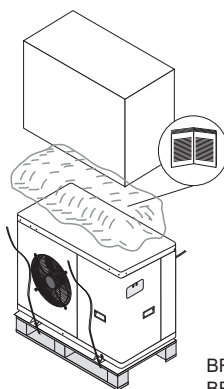
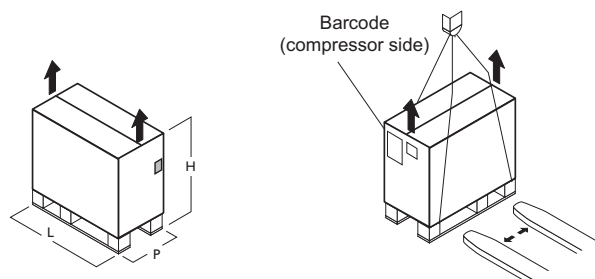
**⚠ The installation, user and maintenance manual** is an integral part of the unit and should therefore be read and kept carefully.

**It is recommended** that the packaging should not be removed until the unit is located in the installation site.

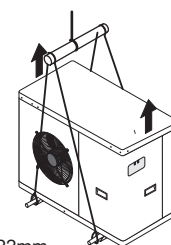
**During transport, the chiller** should be kept in a vertical position

**The weight of the chiller** is biased towards the compressor side (side of the packaging with the barcode, see the figure at the foot of the page).

**⚠ Do not** dispose of packaging materials in the environment or leave them within reach of children as they may represent a hazard.



BRAT(N)2 0021+0061: Ø 22mm  
BRAT(N)2 0071+0121: Ø 25mm



**BRAT2 Dimensions and weight with standard packaging**

Size		0021M-T	0025M-T	0031M-T	0041M-T	0051T	0061T	0071T	0091T	0101T	0121T
Dimension L	mm	970	970	970	970	970	970	1530	1530	1530	1530
Dimension P	mm	480	480	480	480	480	530	650	650	650	650
Dimension H	mm	840	1140	1140	1440	1440	1590	1400	1400	1900	1900
Weight	Kg	100	115	120	145	165	175	260	265	340	345

**BRAN2 Dimensions and weight with standard packaging**

Size		0021M-T	0025M-T	0031M-T	0041M-T	0051T	0061T	0071T	0091T	0101T	0121T
Dimension L	mm	970	970	970	970	970	970	1530	1530	1530	1530
Dimension P	mm	480	480	480	480	480	530	650	650	650	650
Dimension H	mm	840	1140	1140	1440	1440	1590	1400	1400	1900	1900
Weight	Kg	110	125	130	160	180	190	280	285	360	365

**BRAT2 Dimensions and weight with wooden crate**

Size		0021M-T	0025M-T	0031M-T	0041M-T	0051T	0061T	0071T	0091T	0101T	0121T
Dimension L	mm	1070	1070	1070	1070	1070	1070	1630	1630	1630	1630
Dimension P	mm	580	580	580	580	580	630	750	750	750	750
Dimension H	mm	890	1190	1190	1490	1490	1640	1450	1450	1950	1950
Weight difference	Kg	120	140	145	175	195	215	305	310	395	400

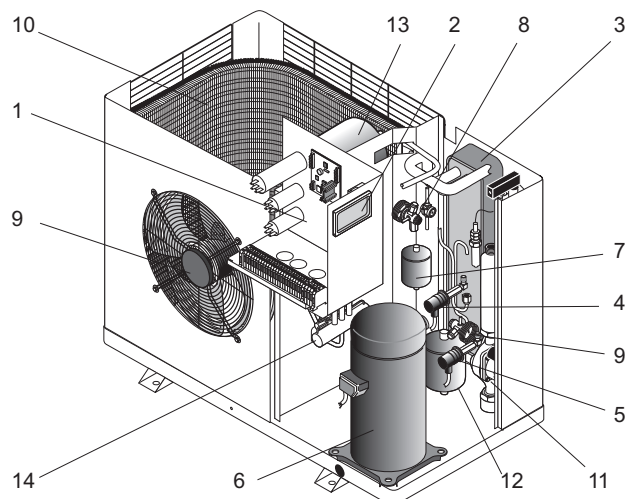
**BRAN2 Dimensions and weight with wooden crate**

Size		0021M-T	0025M-T	0031M-T	0041M-T	0051T	0061T	0071T	0091T	0101T	0121T
Dimension L	mm	1070	1070	1070	1070	1070	1070	1630	1630	1630	1630
Dimension P	mm	580	580	580	580	580	630	750	750	750	750
Dimension H	mm	890	1190	1190	1490	1490	1640	1450	1450	1950	1950
Weight difference	Kg	130	150	155	190	210	230	325	330	415	420

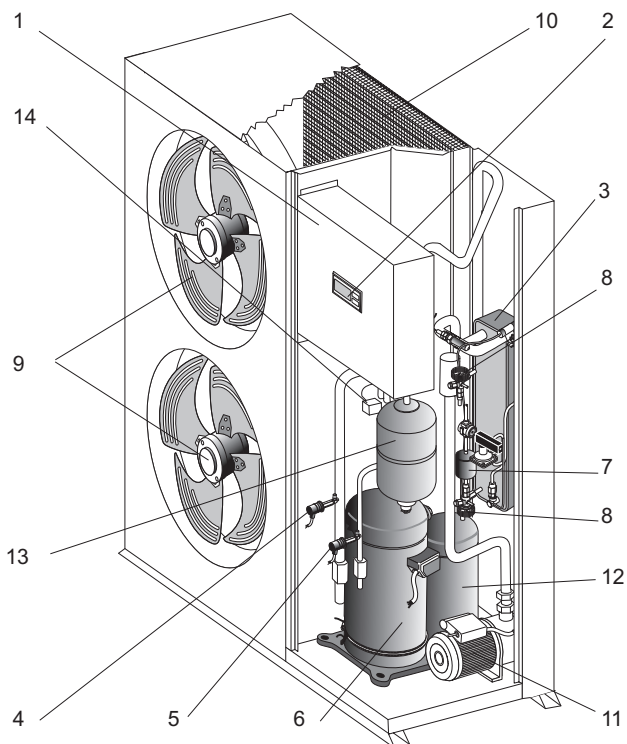
The BRAT(N)2 appliances are air-water units operating on R-410A and refrigerant are suitable for outdoor installation. The units are CE marked, as established by the EU directives, including the latest amendments, and the corresponding approximated national legislation. They are factory tested and on site installation is limited to water and electrical connections.

- 1 Electrical panel
- 2 Control panel
- 3 Heat exchanger, side
- 4 Low pressure switch
- 5 High pressure switch
- 6 Scroll compressor
- 7 Filter
- 8 Thermostatic valve
- 9 Axial-flow fan
- 10 Heat exchanger, outdoor side
- 11 Pump (accessory)
- 12 Liquid receiver (only BRAN2)
- 13 Expansion vessel (models WITH HYDRONIC UNIT only)
- 14 Reversing valve (only BRAN2)

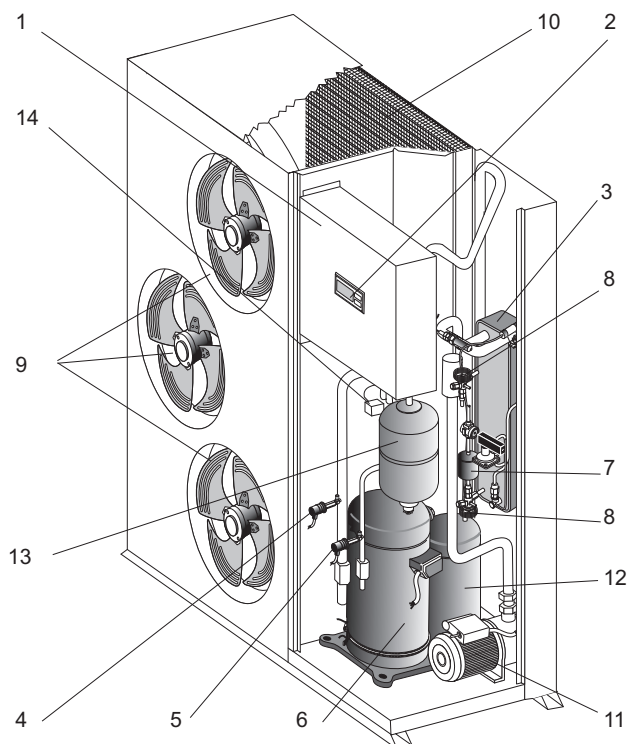
### 0021÷0031

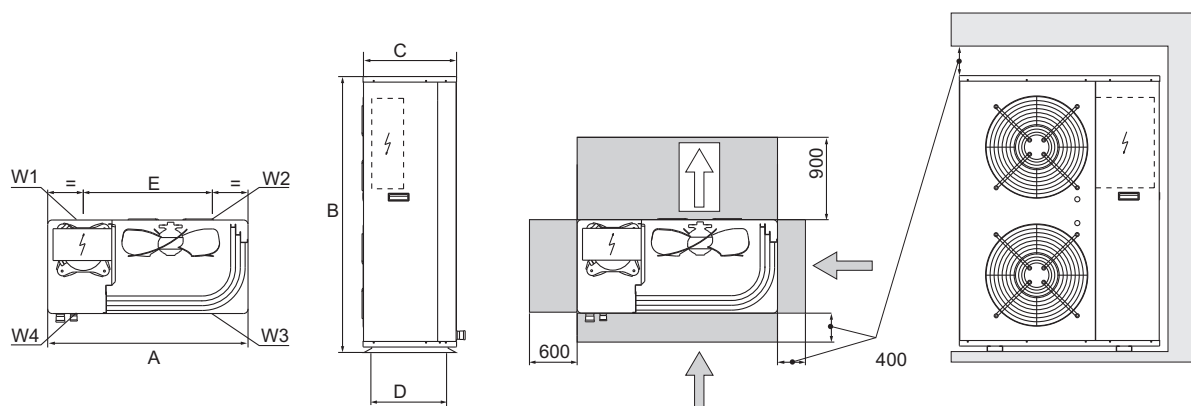


### 0041÷0091



### 0101÷0121





Dimension		0021M-T	0025M-T	0031M-T	0041M-T	0051T	0061T	0071T	0091T	0101T	0121T
A	mm	900	900	900	900	900	900	1450	1450	1450	1450
B	mm	640	940	940	1240	1240	1390	1200	1200	1700	1700
C	mm	370	370	370	370	370	420	550	550	550	550
D	mm	320	320	320	320	320	370	497	497	497	497
E	mm	580	580	580	580	580	580	1477	1477	1477	1477

Weight distribution BRAT2		0021M-T	0025M-T	0031M-T	0041M-T	0051T	0061T	0071T	0091T	0101T	0121T
W1	kg	33	39	41	49	57	60	83	84	110	111
W2	kg	12	14	14	18	20	22	42	43	54	55
W3	kg	11	13	14	16	19	20	39	40	51	52
W4	kg	29	34	36	42	49	53	81	83	105	107
Total in operation	kg	85	100	105	125	145	155	245	250	320	325

Weight distribution BRAN2		0021M-T	0025M-T	0031M-T	0041M-T	0051T	0061T	0071T	0091T	0101T	0121T
W1	kg	37	43	45	55	62	66	92	93	119	120
W2	kg	13	15	16	20	23	24	43	44	55	56
W3	kg	13	15	15	17	21	22	40	41	52	53
W4	kg	32	37	39	48	54	58	90	92	114	116
Total in operation	kg	95	110	115	140	160	170	265	270	340	345

## WATER CONNECTIONS

The choice and installation of components is the responsibility of the installer who should follow good working practice and current legislation. Construction of a bypass is recommended to enable the pipes to be washed through without having to disconnect the unit (see drain valves).

The connection piping should be supported in such a way as to avoid it weighing on the unit.

The following devices must be installed on the water circuit:

- Two pressure gauges with a suitable scale (intake and outlet);
- Two vibration damper joints (intake and outlet);
- Two shut off valves (normal in intake and calibrating in outlet);
- A flow switch on the unit outlet to the system circuit (compulsory). The flow switch must be calibrated by the installer to a value equal to 70% of rated flow.**
- Two thermometers (intake and outlet).
- An intake filter must be installed as close as possible to the evaporator and positioned to allow easy access for routine maintenance. 500 micron filter mesh.**
- All the pipes must be insulated with suitable material to prevent the formation of condensate and heat loss. The insulating material must be a vapour barrier. Make sure that the control and shut-off devices protrude from the insulation.

- At the lowest points in the system, install drain valves for easy emptying.

- At the highest points in the system, install automatic or manual air vent valves.

Failure to install the flow switch will mean the heat exchanger is not protected in the event of no flow of liquid.

Climaveneta cannot be held liable for any damage to the unit and/or the system following the failure to install these devices or the filter.

The correct operation of the components that help ensure the safety of the appliance and the system should be checked regularly.

Specifically, this involves cleaning the filters and checking the operation of the flow switches installed.

Water flow to the chiller unit must conform to the values shown in the section on "General Technical Data".

The flow of water must be maintained constant during operation.

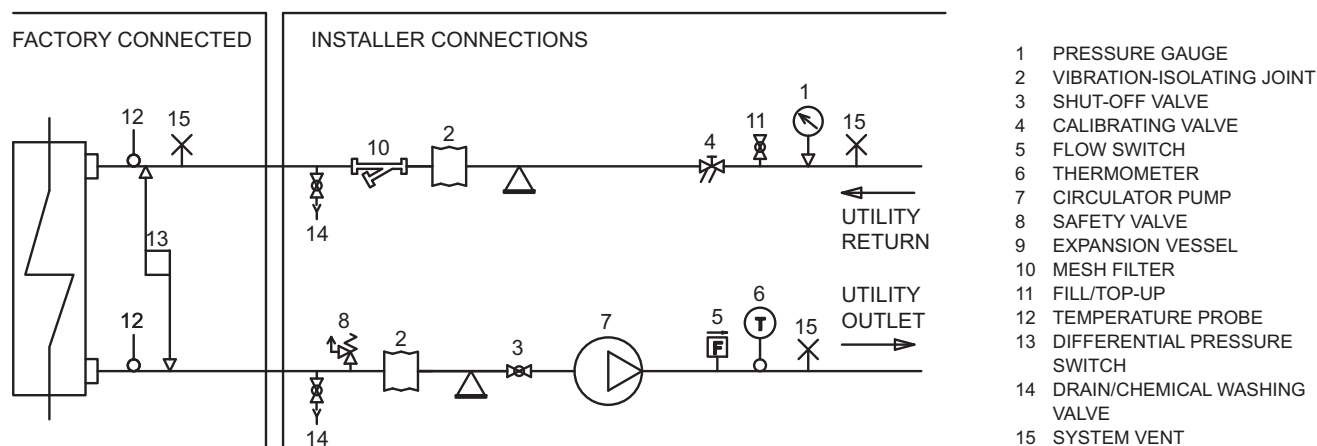
The water content of the unit must be such as to avoid disturbing operation of the refrigerant circuits.

Minimum system water content											
Size		0021M-T	0025M-T	0031M-T	0041M-T	0051T	0061T	0071T	0091T	0101T	0121T
Minimum water content BRAT2	I	18	21	24	31	36	44	55	65	78	94
Minimum water content BRAN2	I	25	35	40	50	55	65	80	90	110	130

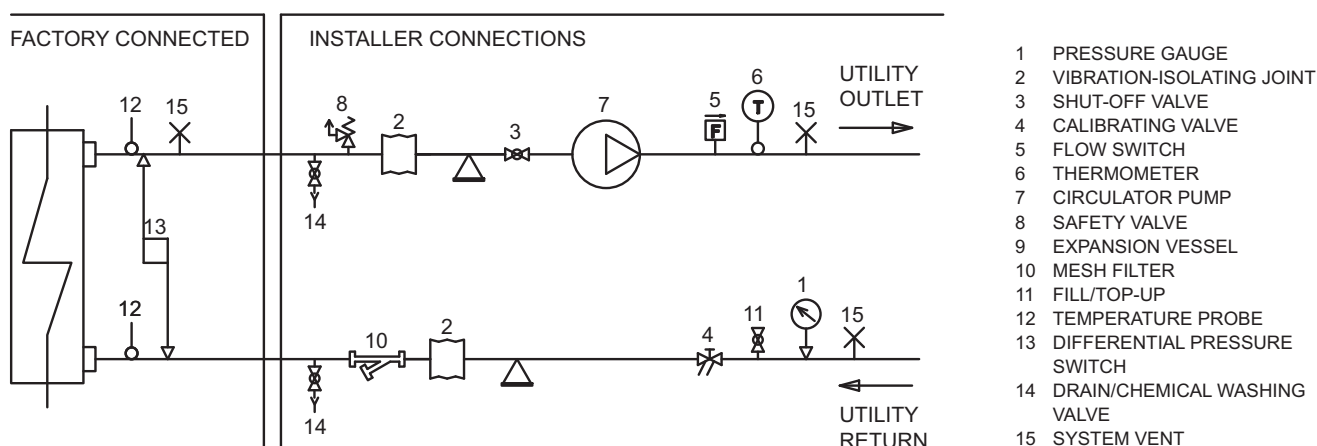
Expansion vessel size											
Size		0021M-T	0025M-T	0031M-T	0041M-T	0051T	0061T	0071T	0091T	0101T	0121T
Expansion vessel BRAT2	I	2	2	2	2	2	2	5	5	5	5
Expansion vessel BRAN2	I	2	2	2	2	2	5	5	5	8	8

Safety valve calibration											
Size		0021M-T	0025M-T	0031M-T	0041M-T	0051T	0061T	0071T	0091T	0101T	0121T
Safety valve	I	6	6	6	6	6	6	6	6	6	6

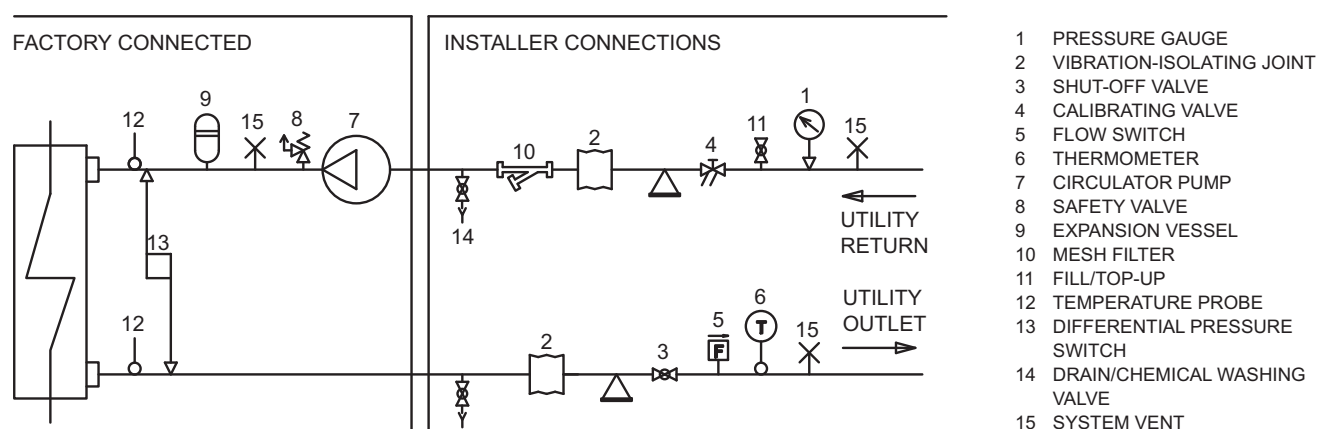
### System water circuit connection diagram, BRAT2 version WITHOUT HYDRONIC KIT



### System water circuit connection diagram, BRAT2 version WITH HYDRONIC KIT

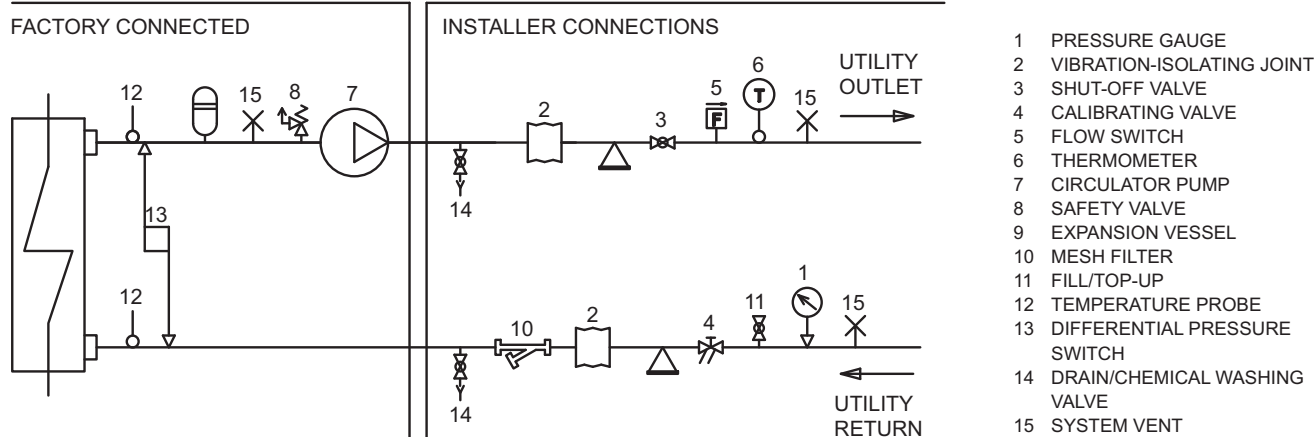


### System water circuit connection diagram, BRAN2 version WITHOUT HYDRONIC KIT





## System water circuit connection diagram, BRAN2 version WITH HYDRONIC KIT



⚠ **The chillers** must be provided with a filling/top-up system connected to the return line and a drain cock in the lowest part of the installation.

**Installations containing antifreeze** or covered by specific legislation must be fitted with water circuit disconnectors.

⚠ The manufacturer is not liable for obstruction, breakage or noise resulting from the **failure to install filters** or vibration dampers.

Particular **types of water used for filling or topping up** must be treated with appropriate treatment systems. For reference values, see the table.

### Risk of freezing

The unit must be prevented from freezing at outside air temperatures around 0°C.

The following are recommended:

- use suitable percentages of antifreeze (see “Ethylene glycol solutions”)
- protect the piping with heating sheaths,
- empty the system, making sure no water remains at the lowest points in the circuit or there are closed valves where water may stagnate.

It is recommended to use non-toxic food grade antifreeze, compliant with the standards in force in the countries where the unit is used, if domestic hot water production is also featured.

The antifreeze used must be corrosion inhibited and compatible with the water circuit components.

### Ethylene glycol solutions

Water and ethylene glycol solutions used as a heat carrier in the place of water reduce the performance of the unit.

Multiply the performance figures by the values given in the following table.

⚠ **The heat pumps** must be fitted with a filling/top-up system connected to the return line and a drain valve in the lowest part of the system.

**Systems containing antifreeze** or covered by specific legislation must be fitted with low-loss headers.

Freezing point (°C)						
	0	-5	-10	-15	-20	-25
Percentage of ethylene glycol by weight						
	0	12%	20%	28%	35%	40%
cPf	1	0,985	0,98	0,974	0,97	0,965
cQ	1	1,02	1,04	1,075	1,11	1,14
cdp	1	1,07	1,11	1,18	1,22	1,24

cPf: cooling capacity correction factor

cQ: flow rate correction factor

cdp: pressure drop correction factor

### Water quality

The water used in the system and domestic hot water circuits must comply with the following characteristics:

PH	6-8
Electrical conductivity	less than 200 mV/cm (25°C)
Chlorine ions	less than 50 ppm
Sulphuric acid ions	less than 50 ppm
Total iron	less than 0.3 ppm
Alkalinity M	less than 50 ppm
Total hardness	less than 50 ppm
Sulphur ions	none
Ammonia ions	none
Silicon ions	less than 30 ppm



## Fouling factors

The performance data given refer to conditions with clean evaporator plates (fouling factor = 1).

For different fouling factors, multiply the figures in the performance tables by the coefficient given in the following table.

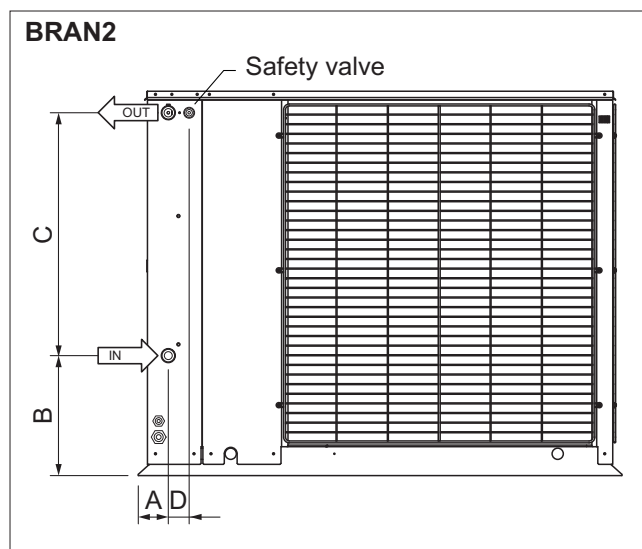
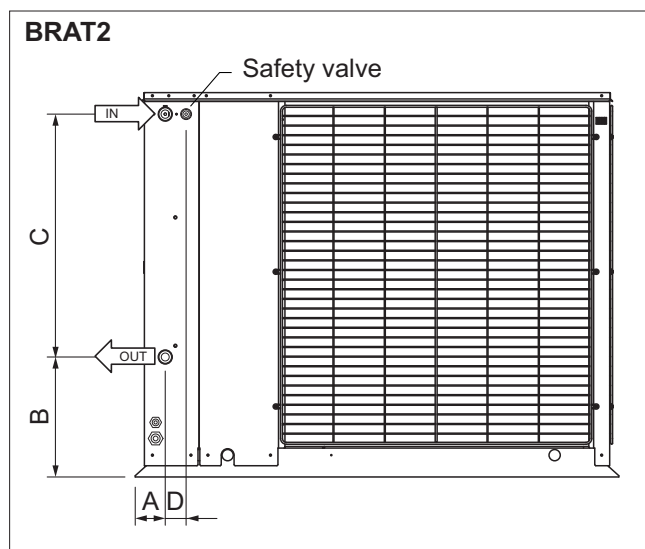
Fouling factors (m <sup>2</sup> °C/W)	Evaporator		
	f1	fk1	fx1
4,4 x 10 <sup>-5</sup>	-	-	-
0,86 x 10 <sup>-4</sup>	0,96	0,99	0,99
1,72 x 10 <sup>-4</sup>	0,93	0,98	0,98

f1: capacity correction factor

fk1: compressor power input correction factor

fx1: total power input correction factor

## SIZE AND POSITIONING OF CONNECTIONS, BRAT2 AND BRAN2



Dimensions		0021	0025-0031	0041-0051	0061	0071-0091	0101-0121
A	mm	72	372	431	581	374	696
B	mm	516	516	757	757	757	757
C	mm	62	62	62	62	94	94
D*	mm	65	65	65	65	65	65
Water connections in/out, male		Ø 1"	1"	1"1/4	1"1/4	1"1/4	1"1/4

\*D Safety valve connector position, only on the models with hydronic kit

## Condensate drain

In heating mode the unit produces a significant quantity of condensate, which must be suitably drained.

Proceed as follows:

- Connect the unit condensate drain
- Make sure the drain hose has a incline of at least 2 cm/m, without obstructions or choking.
- Connect the condensate drain hose to a rainwater drain. Do not connect to the sewage system as odours may be sucked up if the water in the drain trap evaporates.
- After connecting, check correct drainage of the condensate by pouring water into the pan.

- If necessary, suitably insulate the condensate drain hose.
- Condensate drainage must not cause problems to objects or people.
- If the outside air temperature is less than 0°C, the condensate may freeze.

The unit comes with frost protection for the condensate collection basin inside the unit.


Use hot wires on the condensate drain hose downstream of the unit to protect against frost.

## FILLING THE SYSTEM

- Before filling, check that the system drain valve is closed.
- Open all system and terminal air vents.
- Open system shut off valves.
- Start filling by slowly opening the system water fill cock outside the unit.
- When water begins to leak out of the terminal air vent valves, close them and continue filling until the pressure gauge indicates a pressure of 1.5 bar.


## EMPTYING THE SYSTEM

- Before emptying, place the mains switch in the "off" position.
- Make sure the system fill/top-up water cock is closed.
- Open the drain cock outside the unit and all the system and terminal air vent valves.

 **The system must be filled to a pressure of between 1 and 2 bars.**

**It is recommended** that this operation be repeated after the unit has been operating for a number of hours. The pressure of the system should be checked regularly and if it drops below 1 bar, the water content should be topped-up.

**Check** the tightness of the joints.

 **If the fluid in the circuit** contains antifreeze, it should not be allowed to drain freely, as it is pollutant. It should be collected for possible reuse. When draining after heat pump operation, take care as the water may be hot (up to 50°).


## ELECTRICAL CONNECTIONS

I A

The **BRAT2** and **BRAN2** leave the factory already wired, and require the installation of a circuit breaker, a lockable mains disconnect switch for the connection to the mains power supply, and the connection of the flow switch to the corresponding terminals. All the above operations must be carried out by qualified personnel in compliance with the legislation in force.

For all electrical work, refer to the electrical wiring diagrams in this manual. It is also recommended to check that:


- The characteristics of the mains electricity supply are adequate for the power ratings indicated in the electrical specifications below, also bearing in mind the possible use of other equipment at the same time.


 **Power to the unit** must be turned on only after installation work (water and electrical) has been completed.

**All the electrical connections** must be performed by qualified personnel according to the relevant standards in force in the country concerned.

**Respect instructions** for connecting phase, neutral and earth conductors.

The power line should be fitted upstream with a suitable device to protect against short-circuits and leakage to earth, isolating the installation from other equipment.

 **Voltage** must be within a tolerance of  $\pm 10\%$  of the rated power supply voltage for the unit (for three phase units, the unbalance between the phases must not exceed 2%). If these parameters are not respected, contact the electricity supply company. **For electrical connections**, use double insulation cable in conformity with legislation in force in the country concerned.

 **A circuit breaker and a lockable mains disconnect switch, in compliance with the CEI-EN standards (contact opening of at least 3mm), with adequate switching and residual current protection capacity based on the electrical data table shown below, must be installed as near as possible to the appliance.**

 **The devices** on the unit must be lockable.

An efficient earth connection **is obligatory**.

The manufacturer cannot be held liable for any damage caused by the failure to correctly earth the unit.

**In the case of three phase units**, ensure the phases are connected correctly.

 **Do not** use water pipes to earth the unit.

## ELECTRICAL DATA, BRAT2 AND BRAN2 WITHOUT HYDRONIC KIT

Size	Power supply	Maximum values				Fuses (5x20T 250V)			
	(V-Ph-Hz)	FLA [A]	FLI [kW]	SA [A]	SA LIM [A]	FU1	FU2	FU3	FU4
BRAT2 - BRAN2 0021	230-1N-50	16,6	3,1	61,6	27,6	4A	1,25A	2A	-
BRAT2 - BRAN2 0025	230-1N-50	19,6	3,8	82,6	37,6	4A	1,25A	2A	-
BRAT2 - BRAN2 0031	230-1N-50	23,6	4,7	97,6	44,6	4A	1,25A	2A	-
BRAT2 - BRAN2 0041	230-1N-50	27,6	6,0	131,3	46,3	4A	1,6A	2A	-
BRAT2 - BRAN2 0021	400-3N-50	6,1	3,1	32,6	18,6	4A	1,25A	2A	-
BRAT2 - BRAN2 0025	400-3N-50	6,6	3,6	35,6	19,6	4A	1,25A	2A	-
BRAT2 - BRAN2 0031	400-3N-50	8,6	4,4	48,6	26,6	4A	1,25A	2A	-
BRAT2 - BRAN2 0041	400-3N-50	10,6	6,0	65,3	36,3	4A	1,6A	2A	-
BRAT2 - BRAN2 0051	400-3N-50	12,4	6,1	65,3	36,3	4A	1,6A	2A	-
BRAT2 - BRAN2 0061	400-3N-50	15,6	7,4	75,3	42,3	4A	1,6A	2A	-
BRAT2 - BRAN2 0071	400-3N-50	16,8	8,8	102,3	57,3	4A	1,6A	1A	1A
BRAT2 - BRAN2 0091	400-3N-50	18,8	10,0	129,3	71,3	4A	1,6A	1A	1A
BRAT2 - BRAN2 0101	400-3N-50	22,2	11,7	140,9	77,9	4A	3,15A	1A	1A
BRAT2 - BRAN2 0121	400-3N-50	31,6	14,7	141,9	78,9	4A	3,15A	1A	1A

F.L.I. Maximum power input

F.L.A. Maximum current input

S.A. Start-up current

S.A. LIM Peak current with peak limiter

Maximum values for sizing the protection switches and power supply cables

## ELECTRICAL DATA, BRAT2 AND BRAN2 WITH HYDRONIC KIT

Size	Power supply	Maximum values				Fuses (5x20T 250V)			
	(V-Ph-Hz)	FLA [A]	FLI [kW]	SA [A]	SA LIM [A]	FU1	FU2	FU3	FU4
BRAT2 - BRAN2 0021	230-1N-50	17,2	3,1	62,2	28,2	1,25	1,25A	2A	-
BRAT2 - BRAN2 0025	230-1N-50	20,2	3,9	83,2	38,2	1,25	1,25A	2A	-
BRAT2 - BRAN2 0031	230-1N-50	24,2	4,8	98,2	45,2	1,25	1,25A	2A	-
BRAT2 - BRAN2 0041	230-1N-50	28,6	6,1	132,2	47,2	1,25	1,6A	2A	-
BRAT2 - BRAN2 0021	400-3N-50	6,7	3,1	33,2	19,2	1,25	1,25A	2A	-
BRAT2 - BRAN2 0025	400-3N-50	7,2	3,7	36,2	20,2	1,25	1,25A	2A	-
BRAT2 - BRAN2 0031	400-3N-50	9,2	4,5	49,2	27,2	1,25	1,25A	2A	-
BRAT2 - BRAN2 0041	400-3N-50	11,6	6,1	66,2	37,2	1,25	1,6A	2A	-
BRAT2 - BRAN2 0051	400-3N-50	13,4	6,2	66,2	37,2	1,25	1,6A	2A	-
BRAT2 - BRAN2 0061	400-3N-50	16,6	7,5	76,2	43,2	1,25	1,6A	2A	-
BRAT2 - BRAN2 0071	400-3N-50	18,1	9,0	103,6	58,6	1,6	1,6A	1A	1A
BRAT2 - BRAN2 0091	400-3N-50	20,1	10,2	130,6	72,6	1,6	1,6A	1A	1A
BRAT2 - BRAN2 0101	400-3N-50	23,5	12,0	142,2	79,2	1,6	3,15A	1A	1A
BRAT2 - BRAN2 0121	400-3N-50	32,9	15,0	143,2	80,2	1,6	3,15A	1A	1A

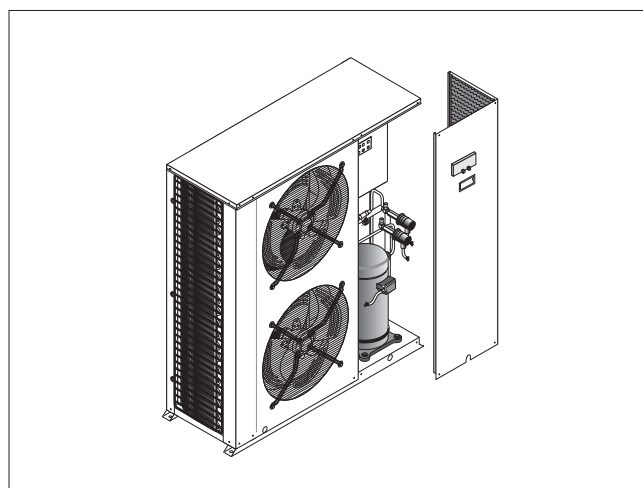
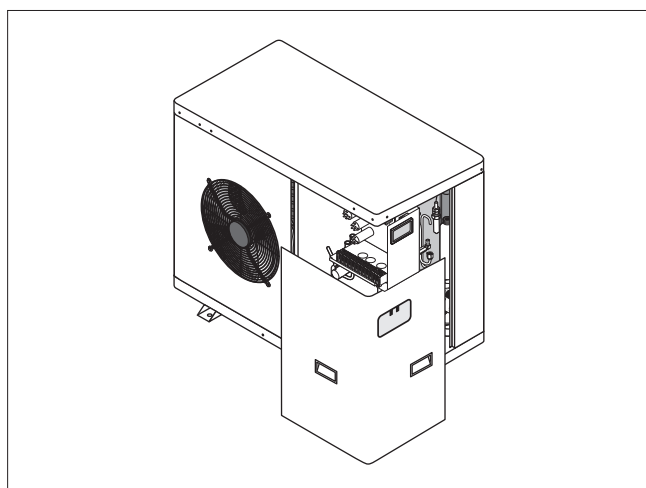
F.L.I. Maximum power input

F.L.A. Maximum current input

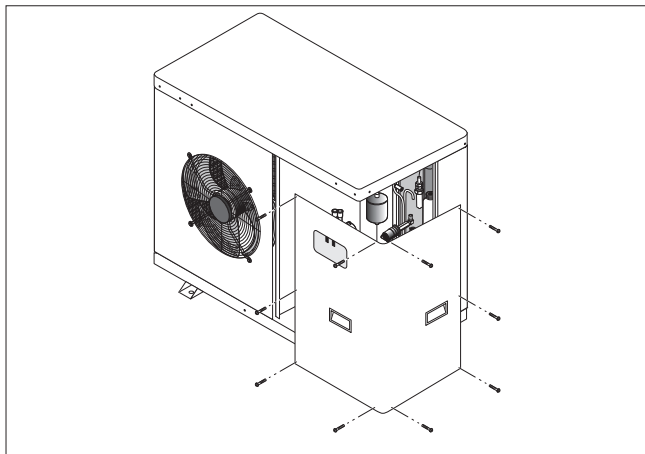
S.A. Start-up current

S.A. LIM Peak current with peak limiter

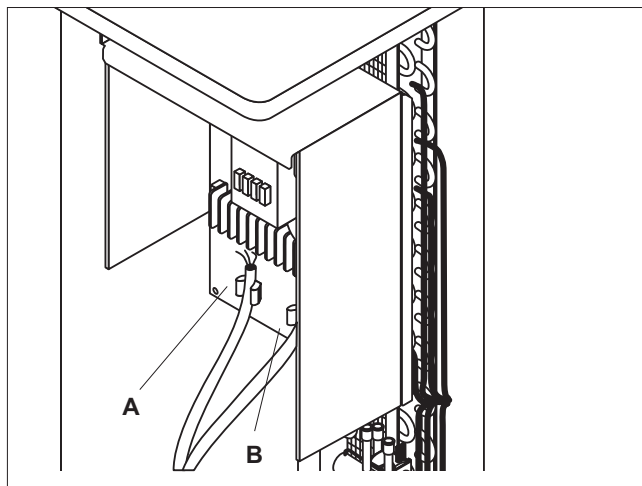
Maximum values for sizing the protection switches and power supply cables



- Before connecting the unit to the power supply, make sure that switch QF1 is open, suitably padlocked and marked.
- Remove the inspection panel by unscrewing the screws.



- Use cable gland **A** for the main electrical power cable and cable gland **B** for other external cables to be connected by the installer.



- Identify the terminals used for electrical connections on the layout drawing shown in this manual.
- Make the connections as shown on the wiring diagram enclosed with the product.
- Replace the covers on the electrical panel and the closing panel.
- Make sure that all the covers removed to make the electrical connections have been replaced before powering up the unit.
- Position the main switch QF1 (outside the unit) in the "ON" position.

## INSTALLER CONNECTIONS

All terminals referred to in the explanations below are to be found on the terminal block inside the electrical panel and described as "installer terminals" (see the wiring diagram enclosed with the product).

### REMOTE ON/OFF (SA1)

To use a remote on/off device, an external contactor must be connected to installer terminals 14 and 15, setting parameter CL42 to -1 (CL42=-1).

For timed operation, connect a daily or weekly timer between terminals 14 and 15.

### REMOTE ALARM (RD1)

For remote display of unit shut-down, an audible or visual alarm warning device can be connected between terminals 12 and 13.

Connect the phase to terminal 13 and the alarm signal device between terminal 13 and the neutral (maximum load applicable 500 mA at 24 V).

### REMOTE COOLING/HEATING CHANGEOVER (SA2)

To use a remote cooling/heating changeover device, connect the contact of the device to installer terminals 16 and 17. To activate the device, proceed as follows:

- From the HSW15 control panel select parameter CL43 and set it to the value +3 (contact closed = cooling, contact open = heating) or -3 (contact closed = heating, contact open = cooling)

### COMPRESSOR ON SIGNAL (GN1)

For remote display of compressor operating status, an audible or visual alarm warning device can be connected between terminals 10 and 11. Connect the phase to terminal 11 and the signal device between terminal 10 and the neutral.

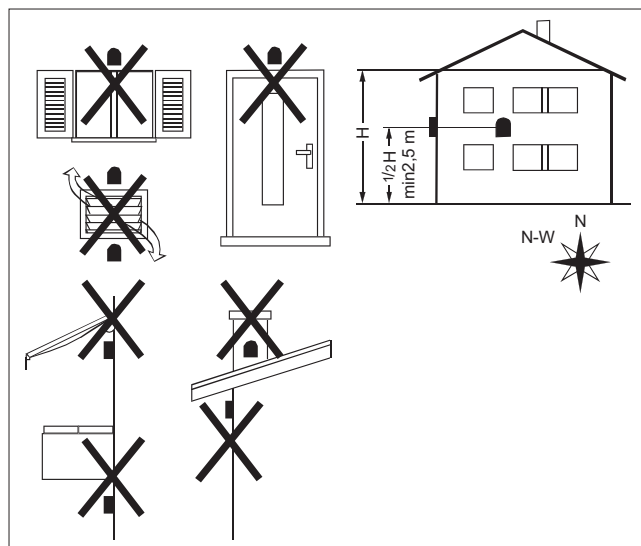
### OUTSIDE AIR PROBE (BT3) (Accessory)

The outside air probe allows the system water temperature set point to be compensated during heating or cooling operation.

#### Installation instructions

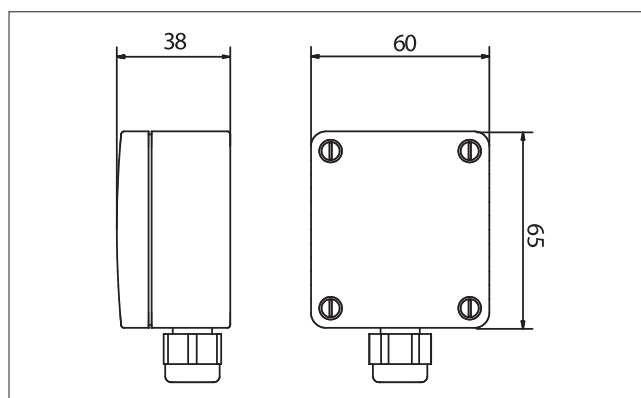
The outside air probe must be installed:

- outside of the home
- not in direct sunlight, away from flue gas discharges, air outlets, or doors and windows.
- on a perimeter wall facing north/north-west
- at a minimum height of 2.5 metres above the ground or at most half way up the house.

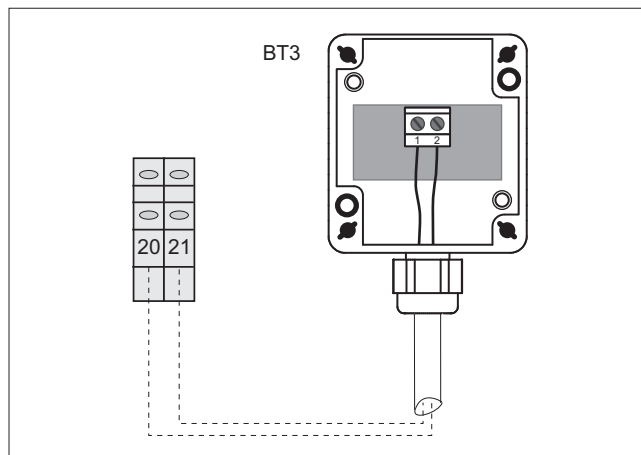


#### Mounting method:

- Open the cover of the sensor.
- Attach a probe to the wall and the correct position as described above.
- For the electrical connections see "Connection diagram".
- Re-place the cover of the sensor.



TECHNICAL DATA	
Sensing element	NTC 10Kohm $\pm$ 1% (25°C)
Degree of protection	IP65
Perm. ambient / carriage temperature	-50°C...+100°C
Measuring range	-50°C...+100°C
Materials	PA 15% GK, Colour RAL 9010



### REMOTE KEYPAD KIT (A5) (Accessory)

The remote keypad kit can be used to display all unit functions and access the parameters of the electronic board from a point located at some distance from the unit itself. It consists of a remote control module.

To install the kit, proceed as follows:

- access the unit's electrical panel after having disconnected the power supply;
- connect the remote control module with 3 wires to terminals 22, 23 and 24 on the installer terminal block:
- terminal 22 connected to the GND terminal on the module;
- terminal 23 connected to the Signal terminal on the module;
- terminal 24 connected to the +12V DC terminal on the module;

### FLOW SWITCH CONNECTION (F3)

The system flow switch must be connected to terminals 18 and 19.

If this is not connected, the unit will not be able to operate and the controller will display alarm code ER20 (see "Displaying alarms").

BRAT2 without hydronic kit			0021	0025	0031	0041	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
Cooling capacity	1	[kW]	7,71	9,50	11,5	15,0	7,70	9,0	11,64	15,7	17,9	20,5	25,1	28,4	35,1	40,6
Power consumption	1	[kW]	2,18	2,71	3,73	4,44	2,11	2,51	3,49	4,61	4,97	5,87	7,53	9,14	9,95	12,9
EER	1		3,54	3,50	3,09	3,39	3,65	3,58	3,34	3,40	3,61	3,50	3,34	3,11	3,53	3,15
Cooling capacity	2	[kW]	5,74	7,03	8,68	11,4	5,72	7,10	8,76	11,8	13,3	15,6	19,0	21,6	26,6	31,5
Power consumption	2	[kW]	2,10	2,60	3,53	4,16	2,06	2,46	3,24	4,32	4,78	5,38	6,81	8,24	9,08	11,9
EER	2		2,73	2,70	2,46	2,74	2,77	2,89	2,70	2,74	2,79	2,89	2,79	2,62	2,93	2,64
ESEER	1		3,31	3,32	3,06	3,21	3,43	3,57	3,26	3,30	3,18	3,39	3,25	3,08	3,42	3,11
Flow-rate	1	m³/h	1,33	1,63	1,98	2,59	1,32	1,55	2,00	2,70	3,09	3,53	4,32	4,89	6,04	6,99
Pressure drop	1	kPa	13	15	16	31	13	14	16	34	36	35	39	39	41	42
Flow-rate	2	m³/h	0,99	1,21	1,49	1,96	0,98	1,22	1,51	2,04	2,29	2,68	3,27	3,71	4,57	5,42
Pressure drop	2	kPa	7	8	9	18	7	8	9	19	20	20	22	22	23	25
Sound power	4	[dBA]	66	66	66	69	66	66	66	69	69	69	74	74	76	76
Power supply		V-N/Ph-Hz	230-1N-50				400-3N-50									
No. of compressors			1	1	1	1	1	1	1	1	1	1	1	1	1	1
No. of circuits			1	1	1	1	1	1	1	1	1	1	1	1	1	1
Type of compressor			Scroll													
No. of fans			1	1	1	2	1	1	1	2	2	2	2	2	3	3
Air flow-rate	1	[m³/h]	3000	3400	3400	6450	3000	3400	3400	6450	6000	6350	6800	6800	10200	10200
No. of system heat exchangers			1	1	1	1	1	1	1	1	1	1	1	1	1	1
Type of system heat exchanger			PLATE													
System water heat exchanger content		I	2	2	2	2	2	2	2	2	2	3	3	3	4	4

(1) outside air 35°C evaporator water IN/OUT 23/18°C

(2) outside air 35°C evaporator water IN/OUT 12/7°C

(3) maximum and minimum operating pressure refer to activation of the pressure switches

(4) sound power based on measurements performed in accordance with ISO 9614 and Eurovent 8/1

Performance in accordance with EN 14511:2013

BRAT2 with hydronic kit			0021	0025	0031	0041	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
Cooling capacity	1	[kW]	7,76	9,56	11,6	15,1	7,75	9,1	11,70	15,8	18,0	20,7	25,3	28,6	35,3	40,9
Power consumption	1	[kW]	2,10	2,62	3,63	4,30	2,03	2,43	3,38	4,49	4,81	5,73	7,31	8,94	9,67	12,6
EER	1		3,69	3,65	3,20	3,51	3,82	3,73	3,46	3,52	3,74	3,61	3,46	3,20	3,65	3,24
Cooling capacity	2	[kW]	5,77	7,08	8,73	11,5	5,75	7,15	8,81	11,9	13,4	15,7	19,1	21,7	26,8	31,8
Power consumption	2	[kW]	2,05	2,54	3,44	4,09	2,01	2,39	3,16	4,23	4,69	5,27	6,63	8,07	8,87	11,8
EER	2		2,82	2,79	2,54	2,81	2,86	2,99	2,79	2,81	2,86	2,98	2,88	2,69	3,02	2,70
ESEER	1		3,43	3,46	3,16	3,31	3,56	3,73	3,37	3,40	3,29	3,51	3,36	3,17	3,53	3,20
Flow-rate	1	m³/h	1,33	1,64	2,00	2,60	1,33	1,56	2,01	2,72	3,10	3,56	4,35	4,92	6,07	7,03
Available pressure head	1	kPa	59	50	40	37	60	53	39	33	26	23	41	34	56	43
Flow-rate	2	m³/h	0,99	1,22	1,50	1,98	0,99	1,23	1,52	2,05	2,30	2,70	3,29	3,73	4,61	5,47
Available pressure head	2	kPa	72	66	59	51	72	66	59	50	49	47	71	66	87	79
Sound power		[dBA]	66	66	66	69	66	66	66	69	69	69	74	74	76	76
Power supply		V-N/Ph-Hz	230-1N-50				400-3N-50									
No. of compressors			1	1	1	1	1	1	1	1	1	1	1	1	1	1
No. of circuits			1	1	1	1	1	1	1	1	1	1	1	1	1	1
Type of compressor			Scroll													
No. of fans			1	1	1	2	1	1	1	2	2	2	2	2	3	3
Air flow-rate		[m³/h]	3000	3400	3400	6450	3000	3400	3400	6450	6000	6350	6800	6800	10200	10200
No. of system heat exchangers			1	1	1	1	1	1	1	1	1	1	1	1	1	1
Type of system heat exchanger			PLATE													
System water heat exchanger content		I	2	2	2	2	2	2	2	2	2	3	3	3	4	4

(1) outside air 35°C evaporator water IN/OUT 23/18°C

(2) outside air 35°C evaporator water IN/OUT 12/7°C

(3) maximum and minimum operating pressure refer to activation of the pressure switches

(4) Sound power based on measurements performed in accordance with ISO 9614 and Eurovent 8/1

Performance in accordance with EN 14511:2013

BRAN2 without hydronic kit			0021	0025	0031	0041	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
Heating capacity	1	[kW]	6,76	8,37	10,5	12,9	6,73	8,3	10,00	13,4	14,8	17,3	21,5	24,7	29,7	35,9
Power consumption	1	[kW]	2,31	2,93	3,57	4,50	2,30	2,78	3,31	4,63	4,79	5,73	6,81	7,84	9,49	11,3
COP	1		2,93	2,86	2,93	2,87	2,93	2,98	3,02	2,89	3,09	3,02	3,16	3,15	3,13	3,17
Cooling capacity	2	[kW]	4,81	5,89	7,29	9,6	4,80	5,99	7,35	10,0	11,1	13,0	15,9	18,4	22,3	27,1
Power consumption	2	[kW]	2,02	2,49	3,36	3,95	1,98	2,36	3,06	4,09	4,53	5,09	6,40	7,80	8,51	11,3
EER	2		2,38	2,37	2,17	2,42	2,43	2,54	2,40	2,43	2,45	2,56	2,49	2,36	2,62	2,39
ESEER	1		2,89	2,92	2,70	2,86	3,00	3,14	2,88	2,94	2,78	3,00	2,89	2,77	3,05	2,83
Flow-rate	1	m³/h	1,16	1,44	1,80	2,22	1,16	1,43	1,72	2,30	2,55	2,98	3,70	4,25	5,11	6,17
Pressure drop	1	kPa	10	12	13	23	10	12	12	25	25	24	28	29	29	33
Flow-rate	2	m³/h	0,83	1,01	1,25	1,64	0,83	1,03	1,26	1,71	1,91	2,24	2,74	3,16	3,84	4,66
Pressure drop	2	kPa	5	6	6	13	5	6	6	14	14	14	16	16	17	19
Sound power	4	[dBA]	66	66	66	69	66	66	66	69	69	69	74	74	76	76
Power supply		V-N/Ph-Hz	230-1N-50				400-3N-50									
No. of compressors			1	1	1	1	1	1	1	1	1	1	1	1	1	1
No. of circuits			1	1	1	1	1	1	1	1	1	1	1	1	1	1
Type of compressor			Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of fans			1	1	1	2	1	1	1	2	2	2	2	2	3	3
Air flow-rate	1	[m³/h]	3000	3400	3400	6450	3000	3400	3400	6450	6000	6350	6800	6800	10200	10200
No. of system heat exchangers			1	1	1	1	1	1	1	1	1	1	1	1	1	1
Type of system heat exchanger			PLATE													
System water heat exchanger content		I	2	2	2	2	2	2	2	2	2	3	3	3	4	4

(1) outside air 7°C; condenser water in/out 40/45°C

(2) outside air 35°C; evaporator water IN/OUT 12/7°C

(3) maximum and minimum operating pressure refer to activation of the pressure switches

(4) Sound power based on measurements performed in accordance with ISO 9614 and Eurovent 8/1

Performance in accordance with EN 14511:2013

BRAN2 with hydronic kit			0021	0025	0031	0041	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
Heating capacity	1	[kW]	6,72	8,32	10,4	12,8	6,68	8,2	9,99	13,3	14,8	17,2	21,4	24,5	29,4	35,7
Power consumption	1	[kW]	2,24	2,85	3,47	4,38	2,23	2,70	3,23	4,54	4,68	5,60	6,65	7,61	9,27	11,1
COP	1		3,00	2,92	3,00	2,92	3,00	3,05	3,09	2,93	3,16	3,07	3,22	3,22	3,17	3,22
Cooling capacity	2	[kW]	4,83	5,93	7,33	9,6	4,82	6,03	7,39	10,0	11,2	13,1	16,0	18,5	22,5	27,3
Power consumption	2	[kW]	1,98	2,44	3,29	3,91	1,94	2,31	2,99	4,03	4,46	5,00	6,27	7,64	8,43	11,1
EER	2		2,44	2,43	2,23	2,46	2,49	2,61	2,47	2,48	2,51	2,62	2,55	2,42	2,67	2,45
ESEER	1		2,97	3,02	2,77	2,91	3,07	3,26	2,97	2,99	2,85	3,09	2,97	2,84	3,12	2,89
Flow-rate	1	m³/h	1,16	1,43	1,79	2,20	1,15	1,42	1,72	2,29	2,55	2,96	3,68	4,21	5,06	6,14
Available pressure head	1	kPa	66	58	48	46	66	58	51	44	44	40	60	52	80	62
Flow-rate	2	m³/h	0,83	1,02	1,26	1,65	0,83	1,04	1,27	1,72	1,93	2,25	2,75	3,18	3,87	4,70
Available pressure head	2	kPa	74	73	67	56	74	73	67	55	55	55	81	79	94	91
Sound power		[dBA]	66	66	66	69	66	66	66	69	69	69	74	74	76	76
Power supply		V-N/Ph-Hz	230-1N-50				400-3N-50									
No. of compressors			1	1	1	1	1	1	1	1	1	1	1	1	1	1
No. of circuits			1	1	1	1	1	1	1	1	1	1	1	1	1	1
Type of compressor			Scroll													
No. of fans			1	1	1	2	1	1	1	2	2	2	2	2	3	3
Air flow-rate		[m³/h]	3000	3400	3400	6450	3000	3400	3400	6450	6000	6350	6800	6800	10200	10200
No. of system heat exchangers			1	1	1	1	1	1	1	1	1	1	1	1	1	1
Type of system heat exchanger			PLATE													
System water heat exchanger content		I	2	2	2	2	2	2	2	2	2	3	3	3	4	4

(1) outside air 7°C; condenser water in/out 40/45°C

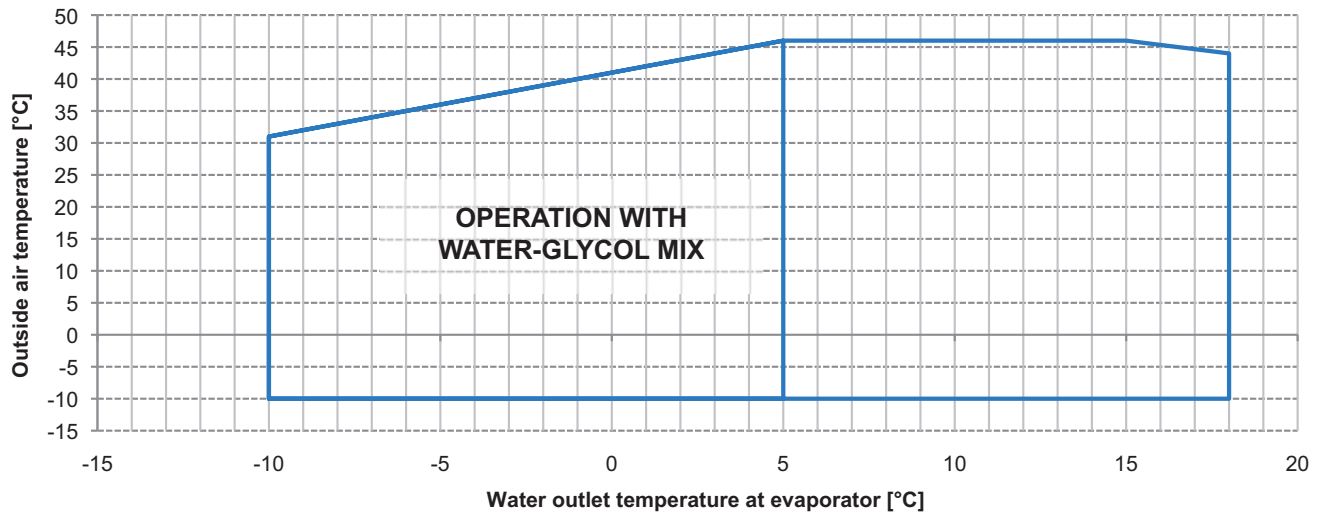
(2) outside air 35°C; evaporator water IN/OUT 12/7°C

(3) maximum and minimum operating pressure refer to activation of the pressure switches

(4) Sound power based on measurements performed in accordance with ISO 9614 and Eurovent 8/1

Performance in accordance with EN 14511:2013



**COOLING**

Operating range in COOLING

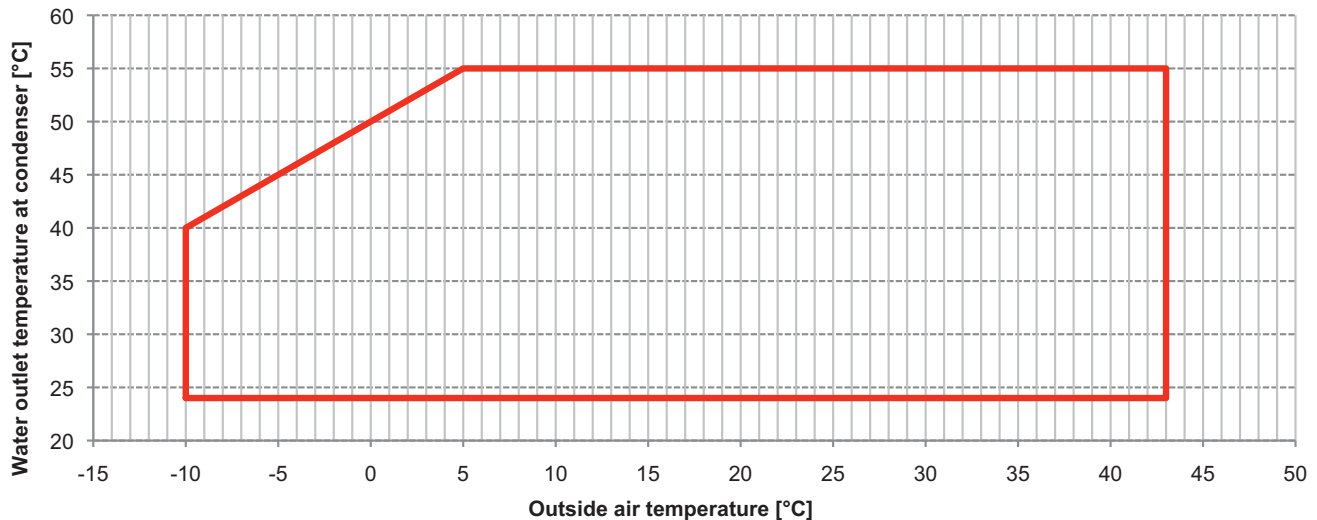
Water temperature head min-max= 3-8 K

Water circuit pressure min-max= 1-3 bars

Max storage temperature= 63°C

Maximum percentage of glycol= 40%

As standard, the unit is manufactured with operating parameters allowing water produced at the evaporator down to +5°C. If needing to produce water down to -10°C, contact technical service.

**HEATING**

Operating range in heating

Water temperature head min-max= 4-10 K

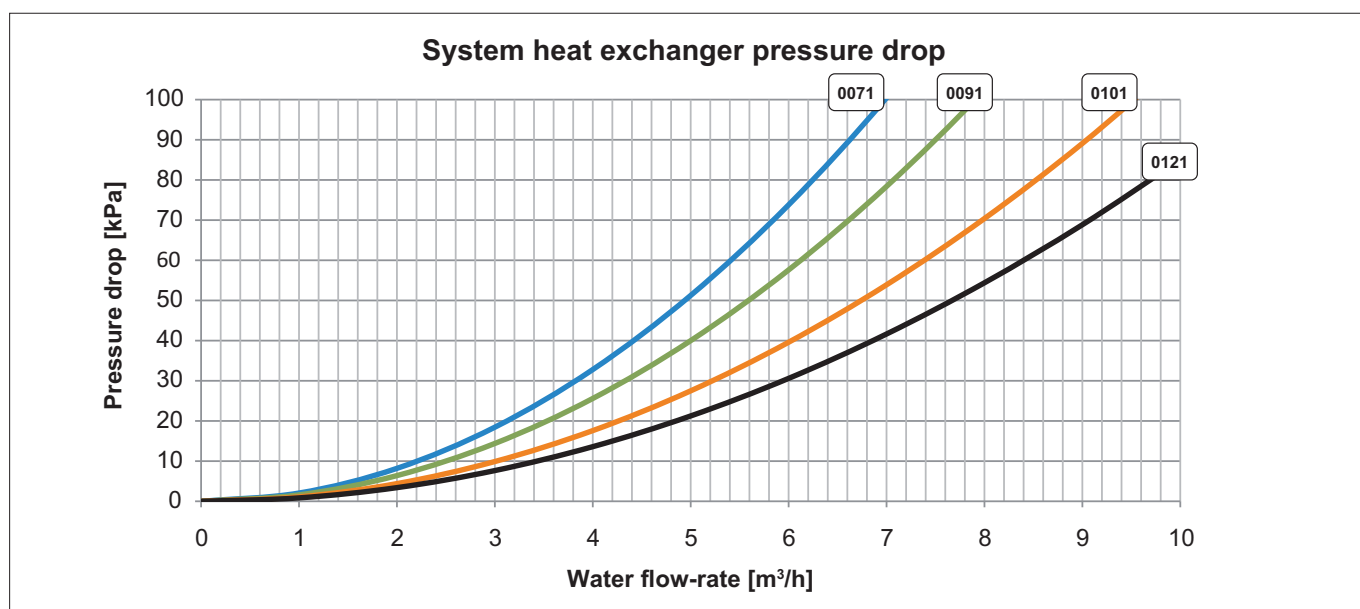
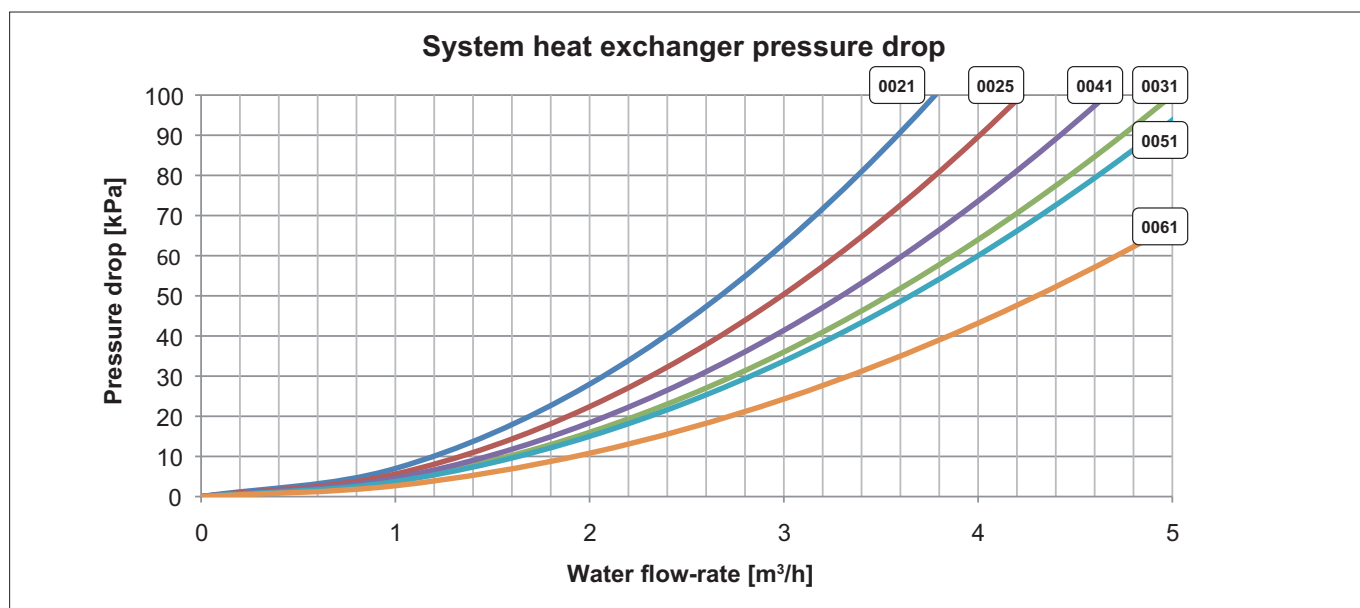
Water circuit pressure min-max= 1-3 bars

Maximum water temperature at system heat exchanger water inlet +50°C

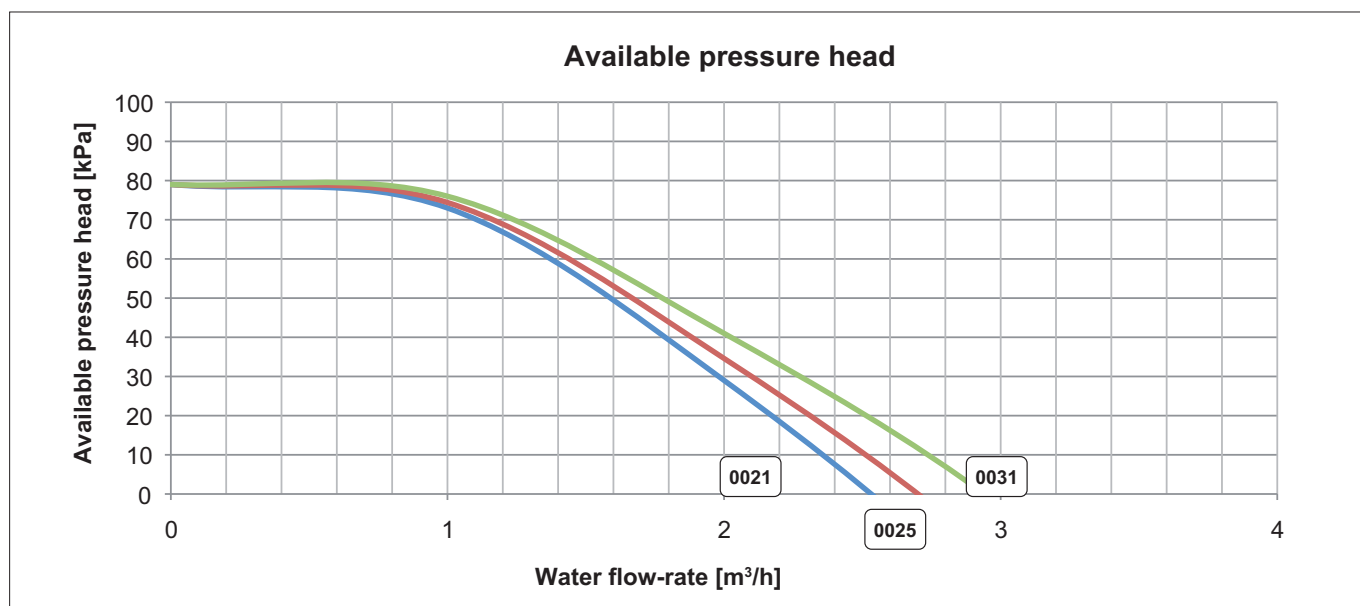
Max storage temperature= 63°C

Maximum percentage of glycol= 40%

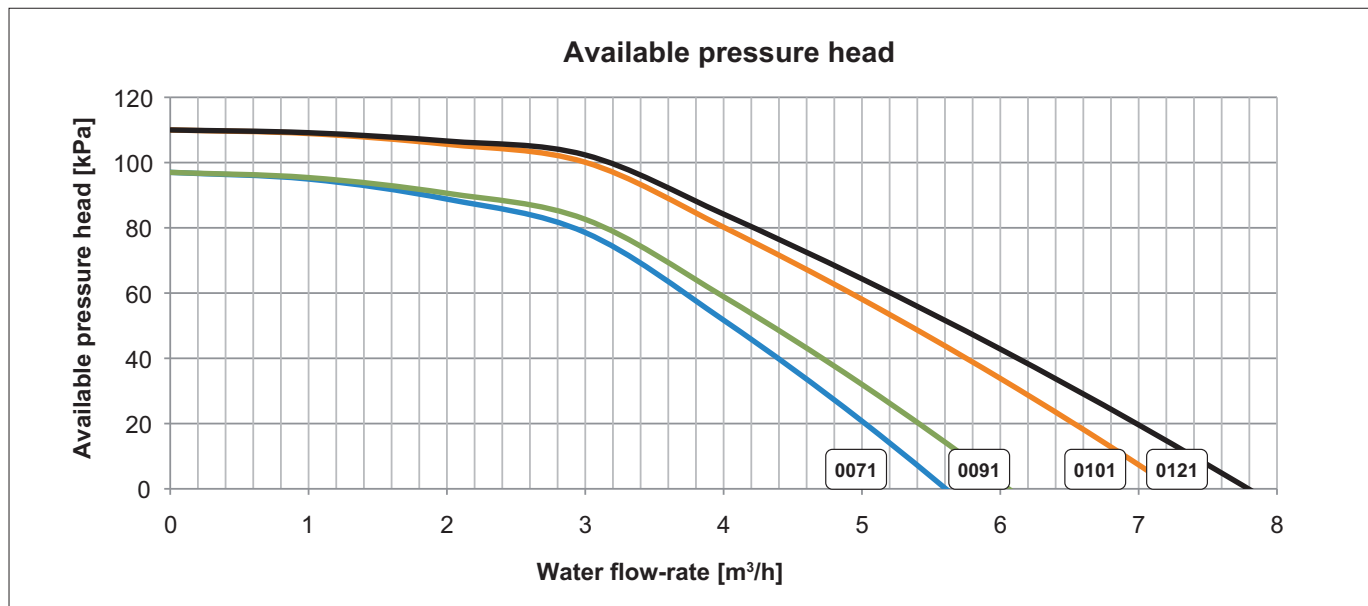
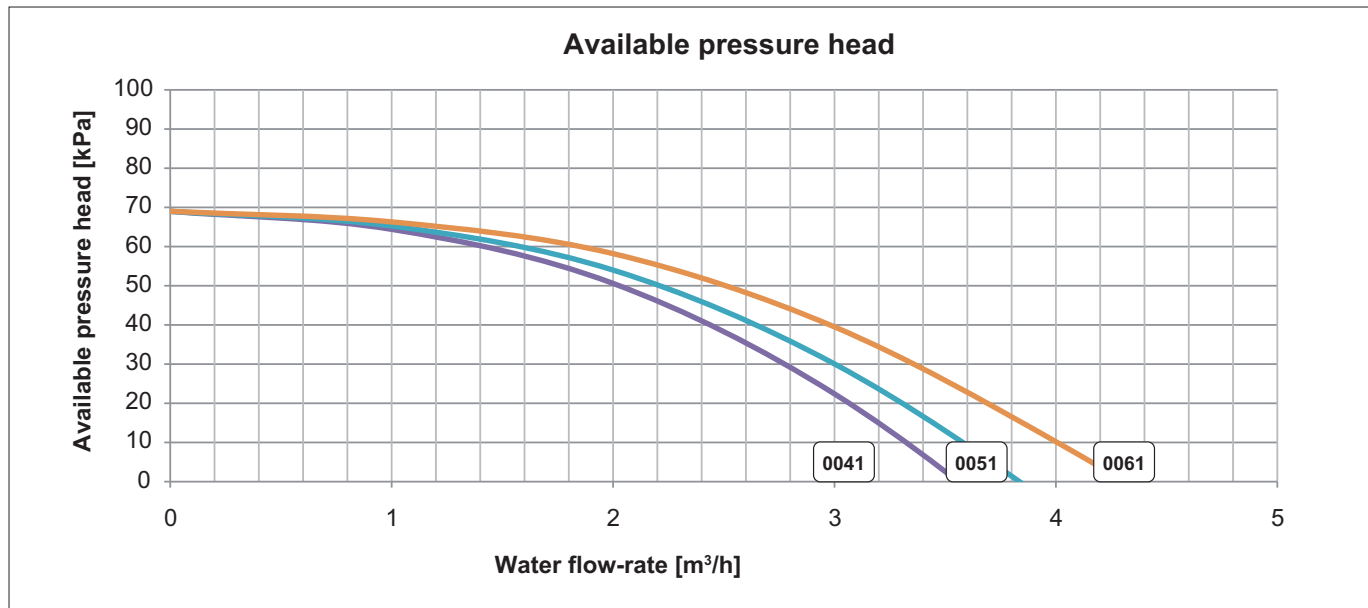
## SYSTEM HEAT EXCHANGER PRESSURE DROP, UNIT WITHOUT HYDRONIC KIT



## AVAILABLE PRESSURE HEAD, UNIT WITH HYDRONIC KIT



## AVAILABLE PRESSURE HEAD, UNIT WITH HYDRONIC KIT



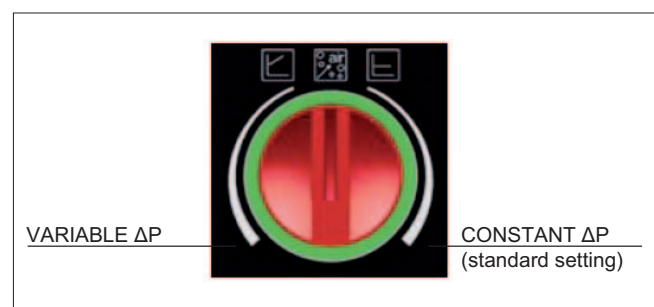
The pressure head refers to the value available to the system.

The pump installed on the unit, if the “hydronic kit” option is purchased as an accessory, is a circulator pump with built-in inverter, including water pressure transducer and micro-processor to manage the following control modes adjustment:

**CONSTANT  $\Delta P$ :** the pressure differential between pump suction and discharge is kept constant, pump speed decreases progressively when the terminals close.

**VARIABLE  $\Delta P$ :** the pressure differential reduces as flow-rate decreases, to account for the lower pressure drop along the piping running to the terminals (recommended for long sections of piping)

The type of control can be set using the selector on the pump body. As standard, the type of control is set to **CONSTANT  $\Delta P$** .



### PREPARING FOR FIRST START UP or restarting after shutting down for long periods.

The unit must be started up for the first time by the **Technical Service**.

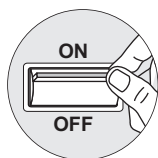
Before starting up the units, make sure that:

- All safety conditions have been respected;
- The unit is adequately fixed to the surface it rests on;
- Clearances have been respected
- Water connections have been carried out as indicated in the instruction manual;
- The water circuit is filled and vented.
- The water valves are open;
- Electrical connections have been carried out correctly
- Voltage is within a tolerance of 10% of the rated voltage for the unit;
- The unit is correctly earthed;
- All electrical connections are tight and all water connections have been carried out correctly.

⚠ The unit must be started up for the first time with standard settings. Set Point values may be modified only after testing has been completed.

Before starting up, power up the unit for at least two hours by switching QF1 and QS1 ON (see "wiring diagram" and the control panel in standby) so as to allow the oil in the compressor sump to heat up.

### ACTIVATING AND DEACTIVATING THE UNIT



- Move the contact on the on/off device SA1 (if featured) to ON.

⚠ During this phase, if the following indications appear on the display, follow the instructions:

- ER20 check the water flow-rate and the connection of the flow switch.
- ER01 (three-phase heat pumps only): check the power supply connection and if necessary reverse two phases.

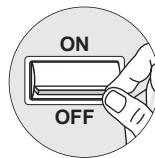
⚠ At every change of season, make sure the operating conditions fall within the limits specified.

**Make sure** the current input of the compressor is less than the maximum shown in the table of technical specifications.

Make sure the voltage is within the established limits and that, for three phase units, the unbalance between the phases is less than 2%.

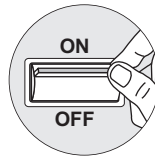
Check that the cover is closed again following the setting procedure.

### STARTING UP FOR THE FIRST TIME (after two hours)



Before starting the chiller:

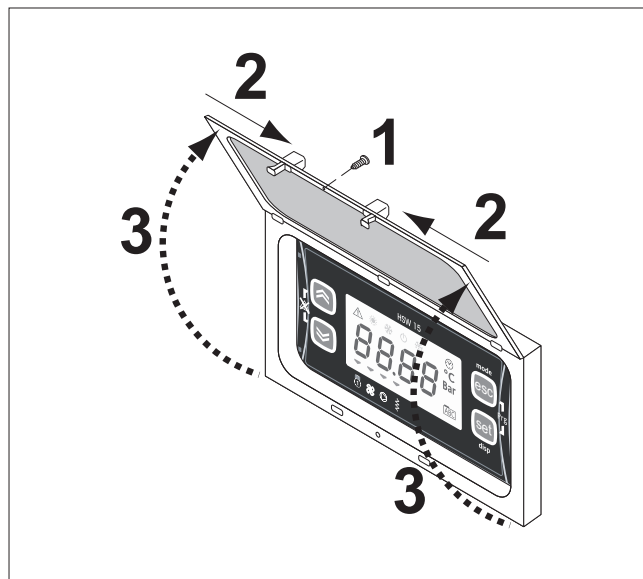
- Make sure the switch QF1 is in the OFF position.
- Make sure the contact of the on/off device SA1 (see the wiring diagram) is open (if featured).



- Close the door of the electrical panel.
- Move the main unit switch QS1 to the ON position.
- Move the switch QF1 (outside the unit) to "ON".

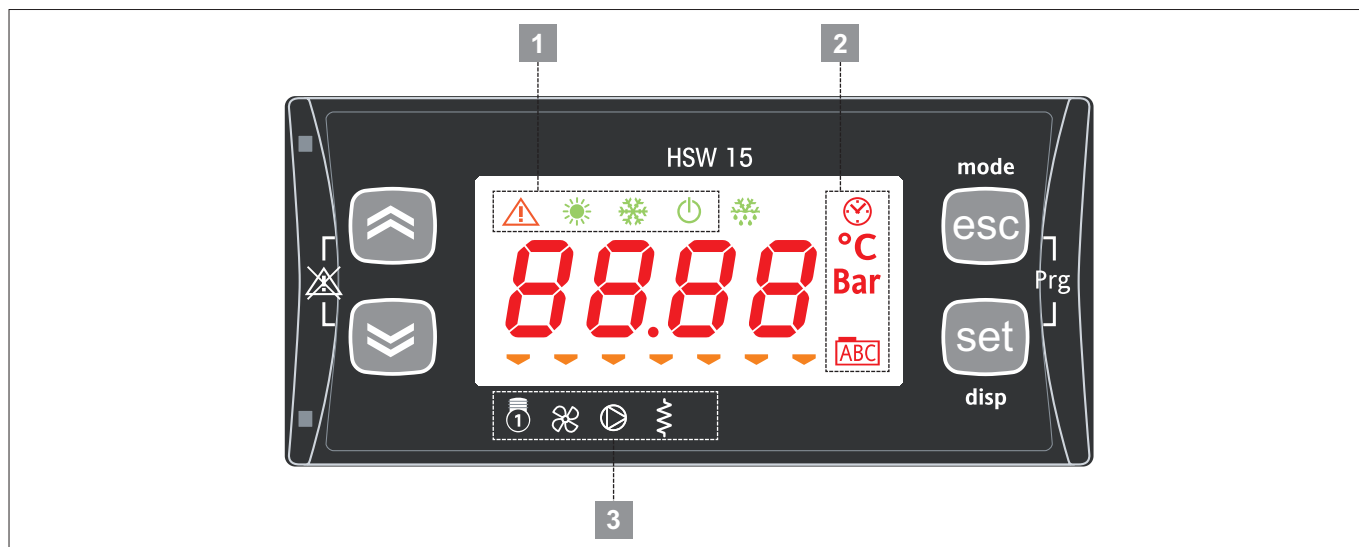
- The icon with the off symbol (⏻) lights up on the control panel, indicating power is connected.

⚠ For the position of internal components, see the diagrams.



To access the control panel, open the door:

- remove the screw 1;
- press the points 2 simultaneously and lift the door 3.



### 1 STATUS AND OPERATING MODE LEDs

	Alarm
	Heating
	Cooling
	Standby
	Defrost

### 2 VALUE AND UNIT OF MEASURE LEDs

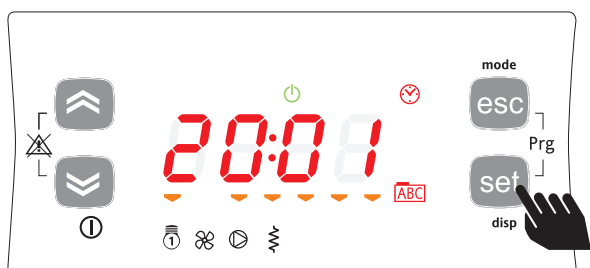
	Clock
	Degrees centigrade
	Pressure (Bar)
	Menu (ABC)

### 3 UTILITY LEDs

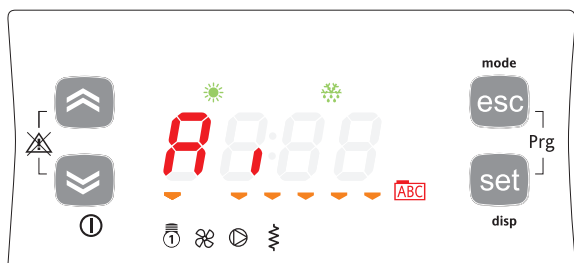
	Compressor
	Fans
	System pump
	Frost protection heater system heat exchanger

## SETTING THE CLOCK

The HSW15 controller is fitted with a clock for managing time bands to control specific events. Follow the procedure shown below to set the hours, minutes and date.

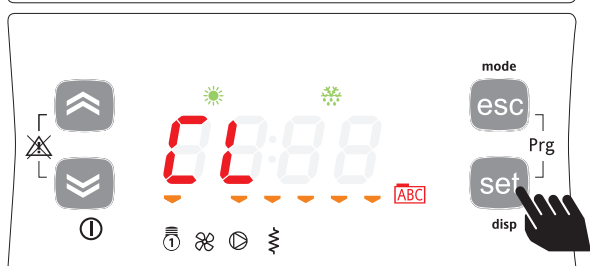


To set the clock of the unit, starting from the main display, press the set button.

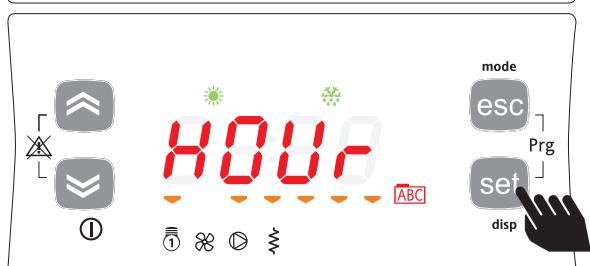


Pressing the set button once displays the various directories.

Scroll the menu using the UP and DOWN buttons until reaching the directory CL.



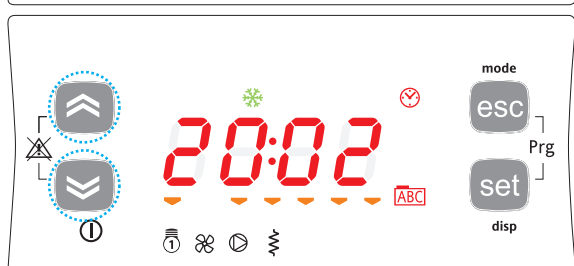
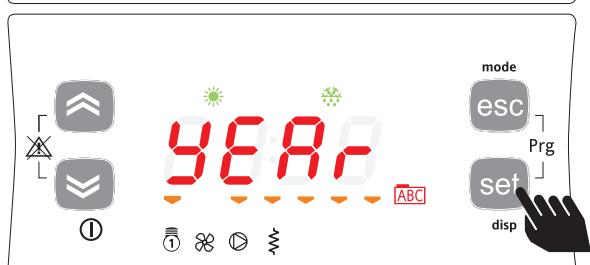
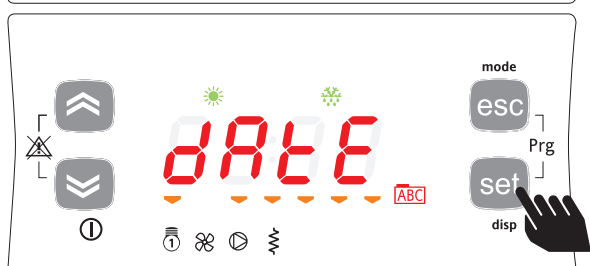
To enter menu CL press the set button.



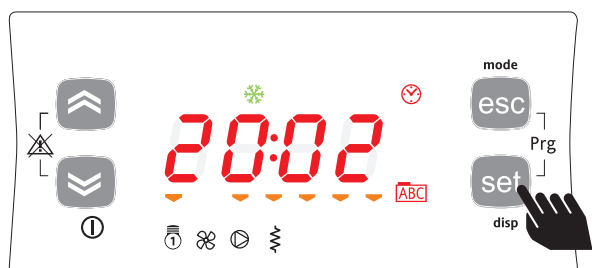
Once having entered this menu, HOUR will be shown. Select whether to set the time, date or year using the UP and DOWN buttons.

Once having decided which value to set, press the [set]\*\* button to enter the corresponding menu.

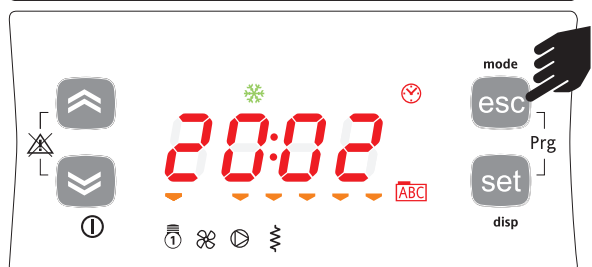
\*\*pressed and held for 3 around seconds.



To set the time, date and year simply scroll with the UP and DOWN buttons until the desired value and



... press the set button.



To exit the clock setting menu press the esc button until returning to the main display.



## SCHEDULER SETTING

The HSW15 controller can manage the unit based on the time and the day of the week.

The controller features four time bands in three profiles that can be combined, when programming, with the days of the week.

The profile defines the behaviour of the unit over a 24 hour period.

Time band management must be enabled by parameter tE00 = 1 (tE00 = 0 standard setting).

Programming example

1) Define the profile for each time band, as shown in the following table.

Description	Description	Profile 1	Profile 2	Profile 3
TIME BAND 1	Hour / Minutes	hours 00 (tE10=0) / min.00 (tE11=0)	hours 00 (tE38=0) / min.00 (tE39=0)	tE66..tE67
	Operating mode ON/Standby	ON (tE12=0)	ON (tE40=0)	tE68
	Cool set point	tE13=15	tE42=15	tE69
	Heat set point	tE14=30	tE42=30	tE70
	DHW set point	tE15=50	tE43=50	tE71
TIME BAND 2	Hour / Minutes	hours 6 (tE17=6) / min.00 (tE18=0)	hours 7 (tE45=6) / min.00 (tE46=0)	tE73..tE74
	Operating mode ON/Standby	ON (tE19=0)	ON (tE47=0)	tE75
	Cool set point	tE20=12	tE48=12	tE76
	Heat set point	tE21=33	tE49=33	tE77
	DHW set point	tE22=45	tE50=45	tE78
TIME BAND 3	Hour / Minutes	hours 9 (tE24=9) / min.00 (tE25=0)	hours 7 (tE52=12) / min.00 (tE53=0)	tE80..tE81
	Operating mode ON/Standby	ON (tE26=0)	ON (tE54=0)	tE82
	Cool set point	tE27=15	tE55=12	tE83
	Heat set point	tE28=30	tE56=33	tE84
	DHW set point	tE29=50	tE57=45	tE85
TIME BAND 4	Hour / Minutes	hours 17 (tE31=17) / min.00 (tE32=0)	hours 17 (tE59=17) / min.00 (tE60=0)	tE87..tE88
	Operating mode ON/Standby	ON (tE33=0)	ON (tE61=0)	tE89
	Cool set point	tE34=12	tE62=12	tE90
	Heat set point	tE35=33	tE63=33	tE91
	DHW set point	tE36=45	tE64=45	tE92

Example of profile 1 to be used  
on opening days

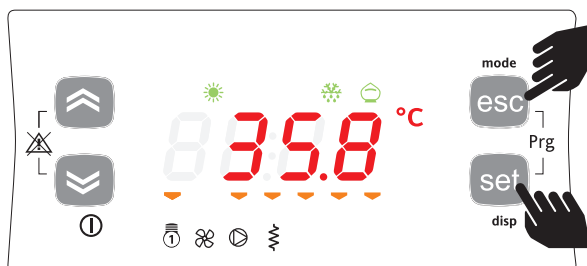
Example of profile 2 to be used  
on closing days

2) Associate one of the three programmed profiles with each day of the week.

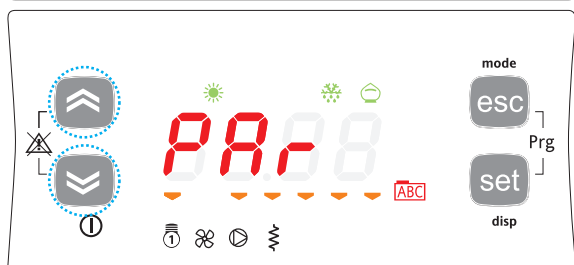
The days of the week are identified by the parameters tE01 to tE07; tE01 = Monday, tE02= Tuesday.....tE07=Sunday.

Once having displayed the day of the week, tE01 to tE07, select the value 1, 2 or 3 corresponding to Profile 1, Profile 2 and Profile 3 respectively.

Follow the operations shown below to program the profiles and combine them with the day of the week:

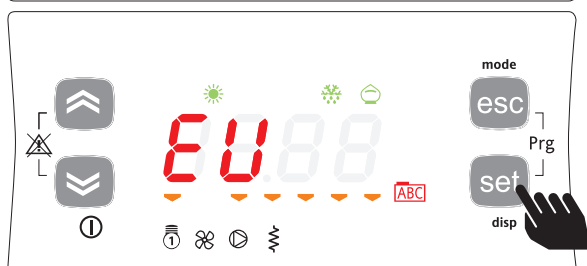


To access directory tE from the main display, press esc and set together. [esc+set].



Pressing these two buttons enters the menu with the list of directories.

Use the up and down buttons to scroll to the directory PAR. Press the set button and use the up and down buttons to scroll to the directory tE.



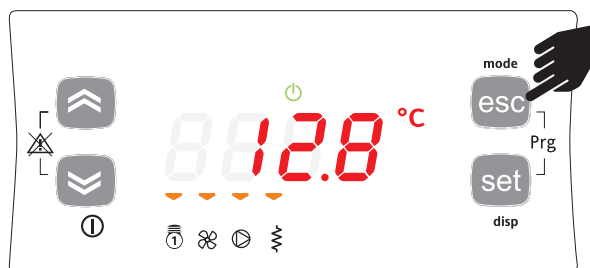
Press the set button to display the first parameter, tE00. Use the up and down buttons to scroll to the other parameters.

To set the selected parameter, press the set button and enter the value using the up and down buttons. Confirm the changes by pressing the set button or alternatively cancel by pressing esc.

## SELECTING THE OPERATING MODE

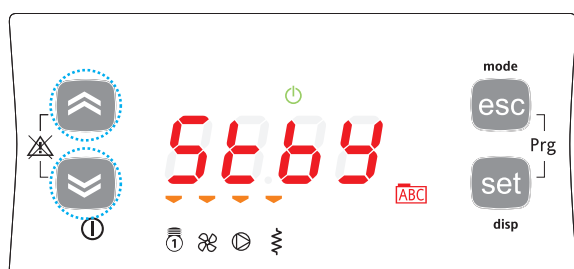
There are three different modes:

- Standby mode (StbY)
- Cooling mode (COOL)
- Heating only mode (HEAT)



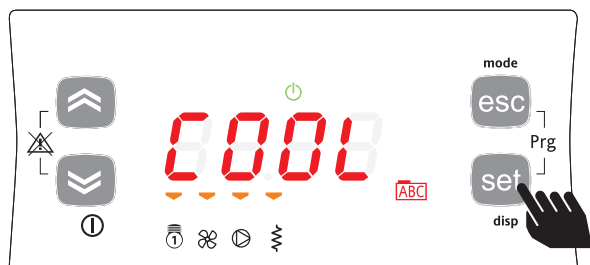
**For example, to switch operation from StbY to COOL.**

To change the operating mode, press and hold the mode button for at least 2 seconds.



A scroll menu will start flashing with the values StbY (standby) and COOL (cool).

Use the up and down buttons to select the desired operating mode.



The unit will automatically return to the main display and the Stby LED, previously on, will now be off and the COOL LED will be on.

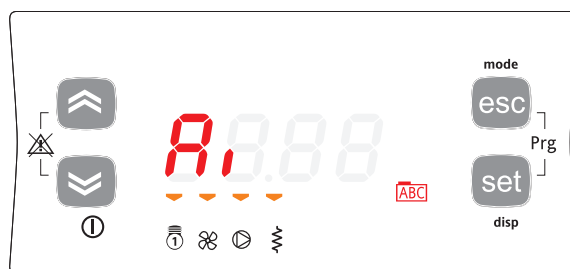


## SETTING THE SET POINTS

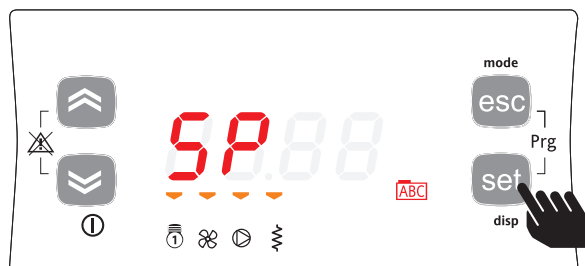
As an example, the Set Point in COOL mode will be changed from 12.0 degrees centigrade to 12.5 degrees centigrade.



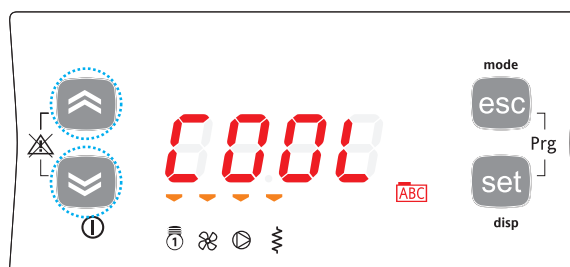
To change the set point, starting from the main display, press the set button.



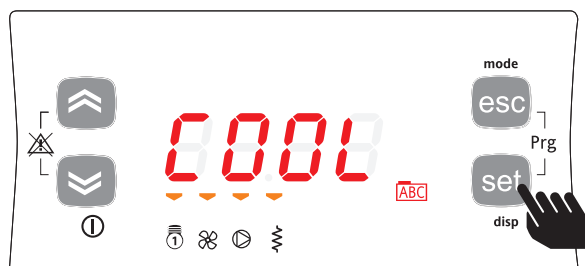
Pressing the set button once displays the various directories. Scroll the menu using the up and down buttons until reaching the SP directory.



To enter the SP directory press the set button.



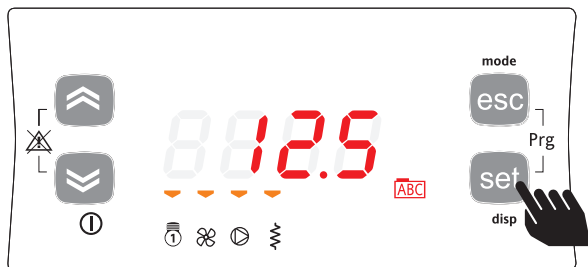
The active mode will be displayed (COOL).



Taking the example of changing the set point for the operating mode. Press the SET button.



The instrument will display the current set point (in this case 12.0 degrees centigrade).  
To increase or decrease the value, use the up and down buttons.  
For example, to change the set point to 12.5 degrees, press the up button until the desired value is displayed.



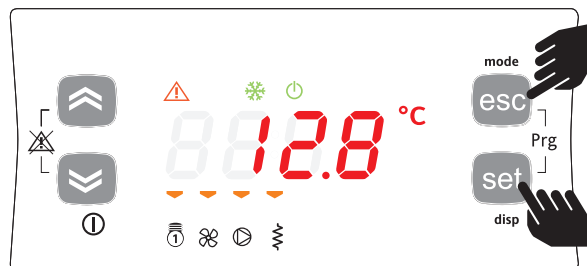
Once having reached the desired set point, press the set button. In this way, the instrument will save the value 12.5.



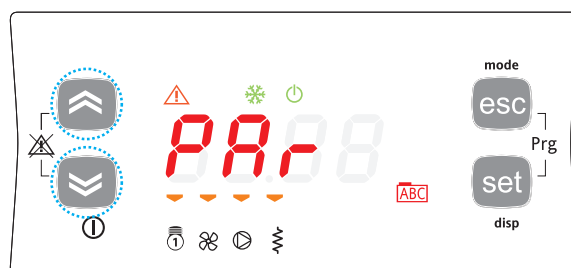
To return to the main display, press esc or wait for the menu timeout to expire (15 seconds).

## SETTING THE PARAMETERS

Accessing the PASS directory (from the main display, pressing the esc and set buttons together [esc+set] and scrolling to the directory with up / down) and setting the PASS accesses the parameters visible for the password entered.



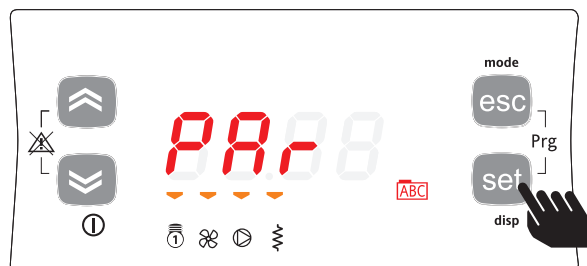
To access the PASS directory from the main display, press esc and set together [esc+set].



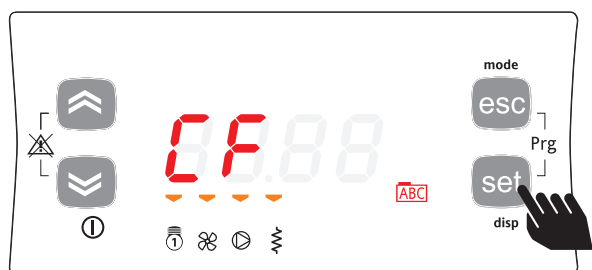
Pressing the two buttons accesses the menu listing the directories.  
Scroll using the up and down buttons to the PASS directory.



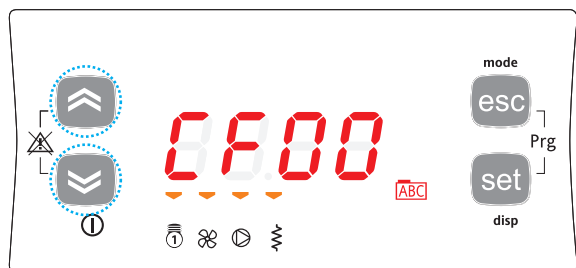
To enter the PASS directory press the set button.  
Then enter the password (installer or manufacturer), press set and exit.  
Access the parameters to display or change the values.



Press the up and down buttons to select the Par submenu.  
Press the set button to display the desired directory.

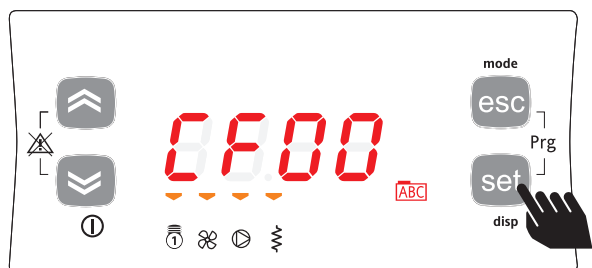


The first directory displayed by the instrument will be the CF directory (configuration).  
To set the individual CF parameters, simply press set again.

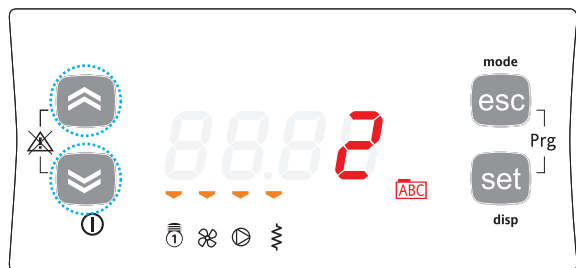


The instrument will display parameter CF00 (default factory settings). To scroll the various parameters, simply press the up button to go to the next parameter (in this case CF01) or the down button to go to the previous parameter (in this case CF47).  
CF00->CF01->CF02->...->CF47->CF00  
CF47<-CF00<-CF01->...<-CF46<-CF47

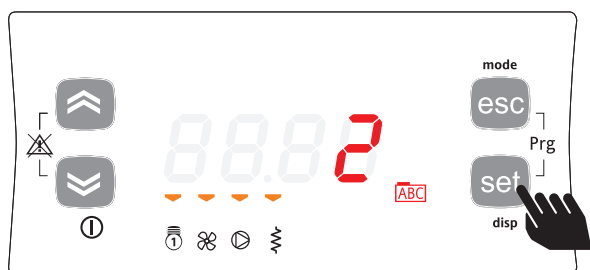
NOTE: -> UP, <-DOWN



To display the value of the parameter (in this case CF00), press the set button.



For parameter CF00, the value displayed will be 2.  
To change the value of the parameter, press the up or down button.

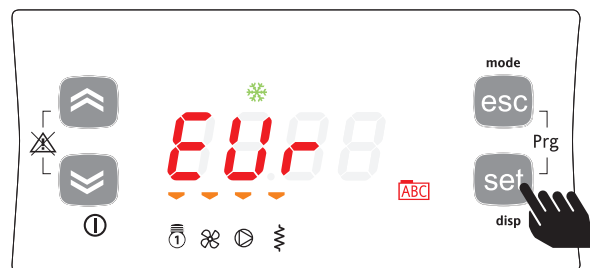


When having selected the value, press the set button. \*\*  
To exit the display and return to the previous level, press esc.

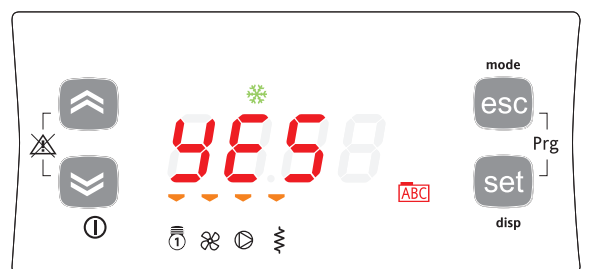
\*\*NOTE: pressing the set button confirms the new value; pressing the esc button returns to the previous level without changing the existing value.

### RESETTING THE ALARM LOG (Er90)

From the main display press "esc + set", the display will show "Par". Scroll using the UP and DOWN buttons until displaying the label "FnC". Press the SET button, the display will show "dEF". Scroll using the UP and DOWN buttons until displaying "EUR".

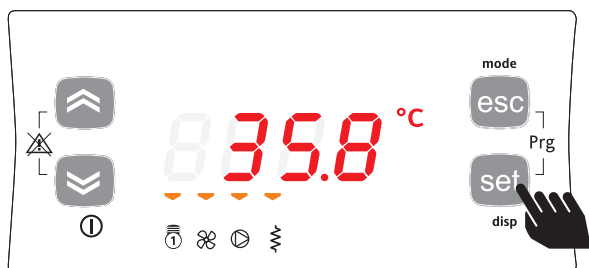


Press the SET button for 3 seconds.



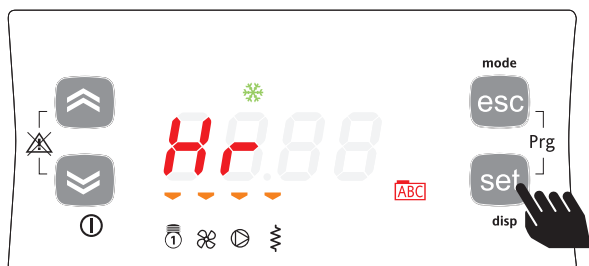
The display shows YES, to confirm that the alarm log has been reset.

## DISPLAYING AND RESETTING COMPRESSOR / PUMP HOURS

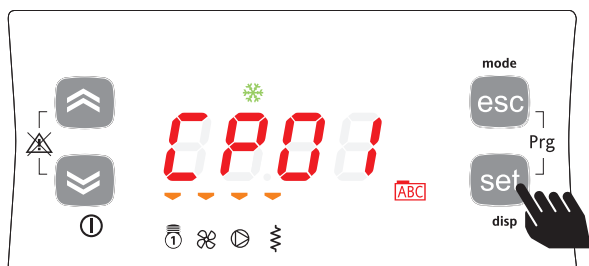


Example of displaying and resetting (tens) the Pump operating hours.

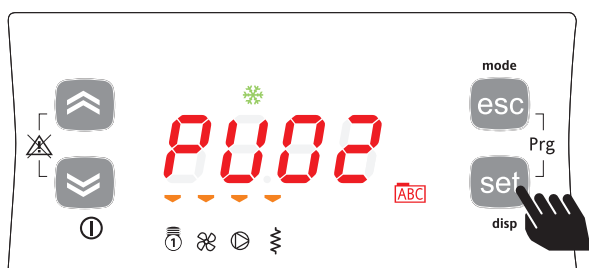
From the main display, press the set button.



The display will show label Ai. Scroll the labels using the UP and DOWN buttons until reaching label Hr.

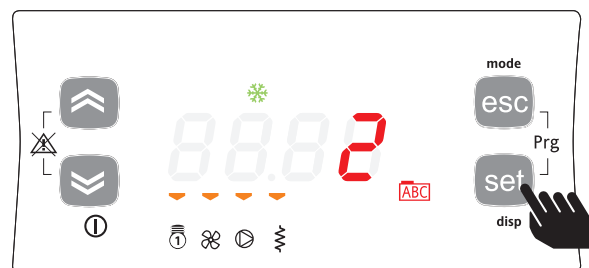


Press the set button to display the first label, in this case the operating hours for compressor 1 (CP01).



Scroll using the UP and DOWN buttons until displaying (if featured among the resources) the operating hours for compressor 2 (CP02) and the operating hours for the pump (PU02).

Press the set button to display the operating hours for the pump PU02.



The tens of operating hours are equal to 2.

(The hours are expressed in tens: 2 indicates 20 operating hours).

To reset the operating hours for the pump PU02, press and hold [set].

Note: to reset the operating hours for the other resources, repeat the procedure described.

To exit the menu, press esc until returning to the main display.

LIST OF ACCESSIBLE PARAMETERS			
	Directory label	Parameters	Parameters for:
	CF	CF00... CF77	Configuration
	Ui	UI00... UI18	User interface
	tr	tr00... tr20	Temperature control
	St	St00... St04	Operating status
	CP	CP00... CP10	Compressor
Primary pump	PI	PI00... PI24	Primary water circuit pump
Fans	FE	FE00... FE30	Fans
Electric heater	HI	HI00... H15	System heat exchanger electric heater
	dS	dS00... dS07	Dynamic set point
	Ad	Ad00... Ad07	Adaptive
	AF	AF00... AF03	Frost protection
	AL	AL00... AL48	Alarms
	CL	C00... CL97	Local I/O configuration

**Note 1:** when setting the parameters the COMPRESSOR and HEATER LEDs will flash alternating with the DEFROST LED.

**Note 2:** the above table shows a list of parameters that are all or partly available only on entering the password.

## DISPLAYING ALARMS I A

FAULT	CAUSE	SOLUTION
Values display indication Er01	High pressure switch tripped, manual reset after 3 activations in one hour, incorrect connection of power supply phases (three-phase models only)	Check fault (see high discharge pressure) Reset manually Change the position of two phases.
Values display indication Er05	Low pressure switch tripped manual reset after 4 activations per hour	Check fault
Values display indication Er 10	Fan circuit breaker tripped Manual reset if active for more than 30 seconds	Check correct sequence of power supply phases (versions 0071-0121)
Values display indication Er20	Differential pressure switch or flow switch tripped Manual reset if active for more than 30 seconds	Check inadequate water flow Check for air in water circuit Check electrical connection (see unit wiring diagram)
Values display indication Er30	System frost prevention alarm (manual reset)	Check water outlet temperature Check water flow Check temperature set point Check correct positioning of sensor BT2
Display indication Er46	Set the clock	See procedure on p. 21
Display indication Er47	HSW15 communication error with remote keypad (only if remote keypad featured)	Check electrical connection
Values display indication Er60	Faulty BT1 system water return sensor (automatic reset)	Check electrical connections Replace component

FAULT	CAUSE	SOLUTION
Values display indication Er61	Faulty BT2 system water outlet sensor (automatic reset)	Check electrical connections Replace component
Display indication Er75	Pressure transducer malfunction	Check electrical connection (see unit wiring diagrams) Replace component
Display indication Er81	Compressor maintenance interval	Check operating pressure Check condition of the compressor Reset the clock
Display indication Er85	Water pump maintenance interval	Check condition of the water pumps Reset the clock
Display indication Er90	Maximum alarm log size exceeded	Reset alarm log

## PEAK LIMITER ALARM SIGNALS



The heat pumps can be fitted with a single-phase or three-phase peak limiter to reduce compressor start-up current.

### Single-phase peak limiter

The green LED on steady indicates line voltage is present. The red LED identifies the type of alarm, based on the sequence of flashes. The orange LED indicates the delay between unit starts and/or stops.

Orange LED	Condition	Action
ON	Minimum recovery time between starts and/or recovery time between stop and start	Autoreset when the minimum recovery time has elapsed
Red LED	Condition	Action
2 flashes	Undervoltage $U_e < 190\text{VAC}$	Autoreset after 5 minutes *
3 flashes	Overcurrent ( $>80\text{ A}$ for 1 sec.)	Autoreset after 5 minutes
4 flashes	Protection relay	Autoreset after 5 minutes **
5 flashes	Ramp incomplete	Autoreset after 5 minutes
Green LED	Condition	Action
Flashing	Power supply alarm	Contact service centre
ON	Device powered, no faults	Awaiting compressor start signal

\* monitored during inactivity and bypass

\*\* In this situation, the red LED flashes 4 times; the service centre needs to be contacted to reset the device.

### Three-phase peak limiter

The three-phase peak limiter has 2 built-in indicator LEDs. The green LED indicates line voltage is present and correct operation. The red LED identifies different alarm conditions based on the sequence of flashes, as shown in the enclosed table.

Red LED	Condition	Action
2	Incorrect phase sequence	Reverse the phases
3	Line voltage out of limits	Autoreset after 5 minutes
4	Frequency out of limits	Autoreset after 5 minutes
5	Locked rotor (during ramp)	Autoreset after 5 minutes
6	Ramp starting > 1 sec	Autoreset after 5 minutes
7	Excess temperature	Autoreset after 5 minutes
8	Low current (during bypass)	Autoreset after 5 minutes
9	Voltage unbalanced	Autoreset after 5 minutes if all the three phases (L1, L2, L3) are connected
Green LED	Condition	Action
Flashing	1 minute recovery between starts and/or recovery time between stop and start	
ON	Device powered, no faults	
ON	Device powered during ramp	



**Cooling set point**

(factory setting) = 12°C, Hysteresis = 3°C.

The compressor starts at outlet water temperatures above 12°C+3°C (15°C).

The compressor stops at water temperatures below 12°C.

In the event of temporary power failure, when power returns, the mode set previously will be retained in the memory.

**Heating set point**

(factory setting) = 40°C, Hysteresis = 3°C.

The compressor starts at water outlet temperatures below 37°C.

The compressor stops at water temperatures above 40°C.

In the event of temporary power failure, when power returns, the mode set previously will be retained in the memory.

**COMPRESSOR START-UP DELAY**

Two functions prevent the compressor from starting up too frequently.

- Minimum time since last shut-down 180 seconds.
- Minimum time since last start-up 300 seconds.

**CIRCULATING PUMP**

The electronic board includes a pump control output. The pump starts when "cool" mode is activated and stops a few seconds after "standby" mode is selected.

After the first few seconds of pump operation when the water flow is at full speed, the water flow alarm functions are activated (differential pressure switch and flow switch).

**FAN SPEED CONTROL**

To enable the unit to function correctly at different outside temperatures, a microprocessor with pressure reading via pressure sensor controls the fan rotation speed. This allows the exchange of heat to be increased and/or decreased, maintaining condensing or evaporation pressures essentially constant.

The fan operates independently of the compressor.

**FROST ALARM**

The frost protection function is always active, so as to prevent the water freezing and damaging the plate heat exchanger; to do this, the microprocessor shuts down the compressor if the temperature measured by the heat exchanger outlet temperature sensor is less than: +4°C on the system side.

The frost prevention temperature set point can be modified by an authorised service centre only and only after verifying that the water circuit contains antifreeze.

Tripping of this alarm shuts down the compressor but not the pump, which remains active.

To reset normal functions, the water outlet temperature must rise to more than: +7°C on the system side.

Reset is manual.

**WATER FLOW ALARM**

The microprocessor provides for the management of a water flow alarm controlled by a differential pressure switch fitted as standard on the appliance and flow switches to be installed on the water inlet piping.

This safety device may trip after the first 60 seconds of pump operation when the water flow is up to speed.

Tripping of this alarm shuts down the compressor but not the pump, which remains active.

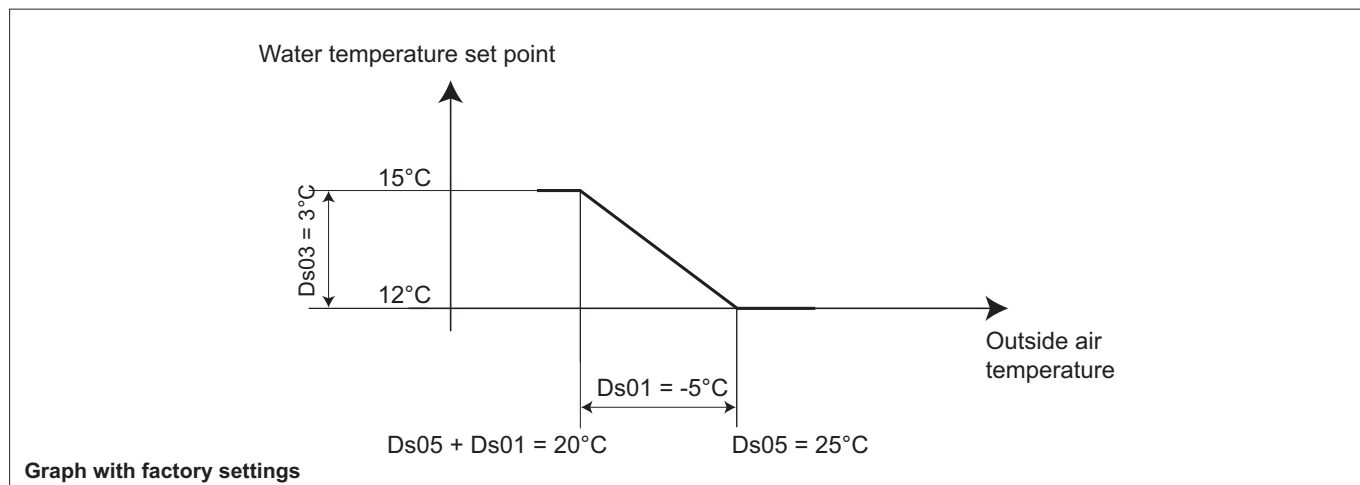
The alarm is reset automatically if it lasts less than 20 sec.

If it lasts longer, it must be reset manually.

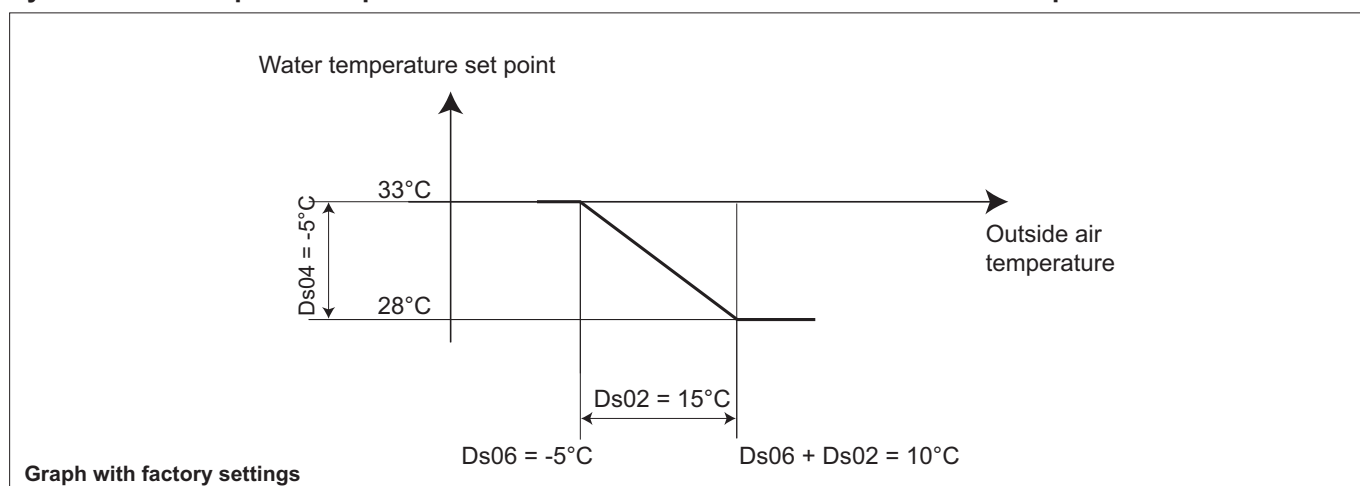
## SYSTEM WATER SET POINT COMPENSATION BASED ON THE OUTSIDE TEMPERATURE

Set point compensation based on the outside temperature must be enabled by setting a parameter, see the table.  
Outside air temperature probe to be purchased as an accessory, not supplied with the unit.

### System water set point compensation in COOLING mode based on the outside temperature



### System water set point compensation in HEATING mode based on the outside temperature



Parameter	Value	Unit of measure	Description
ds00	1		Enable system water set point compensation function
OPERATION IN COOLING MODE			
Ds01	-5	°C	Differential applied to the value of ds05
DS03	3	°C	Differential applied to the system water temperature set point in cooling mode
Ds05	25	°C	Outside air temperature activation/deactivation value for set point compensation function in COOLING
OPERATION IN HEATING MODE			
Ds02	15	°C	Differential applied to the value of ds06
DS04	-5	°C	Differential applied to the system water temperature set point in heating mode
Ds06	-5	°C	Outside air temperature activation/deactivation value for set point compensation function in HEATING

After deactivating the chiller:

- Make sure the remote switch SA1 (if featured) is off.
- Make sure the remote keypad (if featured) shows "OFF".
- Place QF1 in the OFF position (see wiring diagram)
- Deactivate the indoor terminal units by placing the switch of each unit in the "OFF" position.
- Close the water valves.

**⚠ If the mains switch** is turned to "off" for more than four hours, after turning it on and before reactivating the unit, leave the power on but the unit deactivated for at least two hours to preheat the oil in the compressor sump.

## ROUTINE MAINTENANCE

**Never perform any cleaning operations** before having disconnected the unit from the mains power supply.

**Terminals 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19** may be live even when the unit has been disconnected.

Make sure power is not connected before proceeding.

Regular maintenance is fundamental to maintain the efficiency of the unit both in terms of operation and energy consumption.

The Technical Service maintenance plan must be observed, with an annual service which includes the following operations and checks:

- Filling of the water circuit;
- Presence of air bubbles in the water circuit
- Efficiency of safety devices
- Power supply voltage
- Power consumption

- Tightness of electrical and water connections
- Condition of the compressor contactor
- Verification of operating pressure, superheat and subcooling
- Efficiency of the compressor heater

During the maintenance operations, the chiller inspection panel may need to be removed.

If this is the case, proceed as follows:

- Open the door of the electrical panel.
- Undo the screws as shown in the figure
- Remove the inspection panel

To replace the inspection panel, repeat the procedure in reverse.

## UNSCHEDULED MAINTENANCE

**Never perform any cleaning operations** before having disconnected the unit from the mains power supply.

**Terminals 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19** may be live even when the unit has been disconnected.

Make sure power is not connected before proceeding

### CHEMICAL WASHING

It is recommended to chemically flush the plate heat exchanger after every 3 years of operation.

For instructions on how to carry out this operation, call the toll free number.

### REFRIGERANT GAS CONTENT

The chillers are charged with R-410A refrigerant gas and tested in the factory.

In normal conditions, there should be no need for the Technical Service to intervene to check the refrigerant gas.

However, over time, small leaks may develop at the joints leading to loss of refrigerant and draining of the circuit, causing the unit to function poorly.

In this case, the leaks of refrigerant must be identified and repaired and the refrigerant circuit recharged.

Proceed as follows:

- Empty and dry the entire refrigerant circuit using a vacuum pump connected to the low and high pressure tap until the vacuumometer reads about 10 Pa.
- Wait a couple of minutes and check that this value does not rise to more than 50 Pa.
- Connect the refrigerant gas cylinder or a filling cylinder to

the low pressure line pressure gauge connection.

- Charge the quantity of refrigerant indicated on the unit's rating plate.
- Always check the superheat and subcooling values, which should be between 5 and 10 °C and 4 and 8 °C.
- After a couple of hours operation, check that the liquid indicator indicates a dry circuit (dry-green).

**⚠ In the event of partial leaks**, the circuit must be completely emptied before being recharged.

**The R-410A refrigerant** must only be charged in the liquid state.

**Operating conditions** other than rated conditions may produce considerably different values.

**Tightness testing** or identification of leaks must only be carried out using R-410A refrigerant gas, checking with a suitable leak detector.

The refrigerant circuit **must not be charged** with a refrigerant other than that indicated.

The use of a different refrigerant may cause serious damage to the compressor.

- ⊖ Oxygen, acetylene or other flammable or poisonous gases **must never be used** in the refrigerant circuit as they may cause explosion or poisoning. Oils other than those indicated on page 16 **must not be used**.
- The use of a different oil may cause serious damage to the compressor.

## DISPOSAL

**The unit must be disposed** of according to the legislation in force in the country concerned.

FAULT	CAUSE	SOLUTION
<b>The unit doesn't start</b>	Power failure	Check presence of voltage Check safety systems upstream of the appliance
	Switch QF1 in OFF position Remote switch (if featured) in OFF position Control panel in standby Main switch QS1 in OFF Compressor circuit breaker OFF	Switch ON
	Power supply voltage too low	Check power line
	Contactator coil faulty HSW15 controller fault Start-up capacitor faulty (if featured) Compressor faulty Reversed phases (three-phase units only)	Replace the component
<b>Insufficient capacity</b>	Insufficient refrigerant Unit sized too small Operation outside recommended limits	Check
<b>Compressor noisy</b>	Liquid returning to compressor Inadequate fastening	Check
<b>Noise and vibrations</b>	Contact between metal bodies	Check
	Weak foundations	Repair
	Loose screws	Tighten screws
<b>Protection devices trip and shut down the compressor</b>	Excessive discharge pressure Low suction pressure Low voltage Electrical connections not sufficiently tight Operation outside permitted limits	Check
	Faulty operation of pressure switches	Replace the component
	Replace the component	Circuit breaker tripped Check supply voltage Check electrical insulation of windings

FAULT	CAUSE	SOLUTION
<b>High discharge pressure (greater than 32 bars)*</b>	High outside water temperature High utility water inlet temperature	Check
	Insufficient water flow-rate in outside heat exchanger	Check pump operation
	Faulty operation of outside heat exchanger control (pressure regulating valves)	Check
	Air in water circuit	Vent
	Excessive refrigerant charge	Check
<b>Low discharge pressure (less than 16 bars)*</b>	Low utility water inlet temperature	Check
	Moisture in the refrigerant circuit (flow indicator - moisture yellow)	Empty and refill
	Faulty operation of outside heat exchanger control (pressure regulating valves)	Check
	Air in water circuit	Vent
	Insufficient gas charge	Check
<b>High suction pressure (greater than 20 bars)*</b>	High utility water inlet temperature Thermostatic expansion valve faulty or excessively open	Check
<b>Low suction pressure (less than 4 bars)*</b>	Low utility water inlet temperature Low outside water inlet temperature Thermostatic expansion valve faulty or blocked Blocked water filter Blocked plate heat exchanger	Check

\*Values indicative only