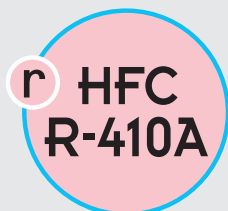




EN

Water-cooled liquid chillers



**BRH FF**

**0011÷0121**

<b>U I A</b>	General warnings	4	<b>I A</b>	Operating limits	18
<b>U I A</b>	Waiver of liability	4	<b>A</b>	Checking and starting up the unit	19
<b>U I A</b>	Fundamental safety rules	4	<b>A</b>	HSW12 functions	20
<b>I A</b>	Receiving and handling the product	5	<b>A</b>	LEDs and display	21
<b>I A</b>	General warnings	5	<b>I A</b>	Displaying alarms	27
<b>I</b>	Dimensional drawings	6	<b>I A</b>	Operating characteristics	29
<b>U I A</b>	Installation	7	<b>A</b>	Shutting down for long periods	29
<b>I A</b>	Water connections	7	<b>A</b>	Routine maintenance	30
<b>I A</b>	Water circuit data	10	<b>A</b>	Special maintenance	30
<b>I A</b>	Sound pressure	10	<b>I A</b>	Troubleshooting	31
<b>I A</b>	Electrical connections	10	<b>U I A</b>	Useful information	33
<b>I A</b>	General technical data	17			

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



**User**



**Important**



**Danger high temperatures**



**Installer**



**Prohibition**



**Assistance**



**Danger voltage**



Eurovent certification program.

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

**⚠ These appliances have been designed** to chill water and must be used in applications compatible with their performance characteristics.

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.

**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.

## 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 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 switching the unit OFF.

**Do not stand** or sit on the unit and/or rest objects of any kind on top of it.

**Do not spray** or throw water directly on the appliance.

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

**⚠ 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.

**Power supply:** the cross section 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.

**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 (only if there is the risk of freezing).

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

The units are delivered in a single pack on a wooden pallet protected by plastic packaging. The unit is supplied accompanied by the following material:

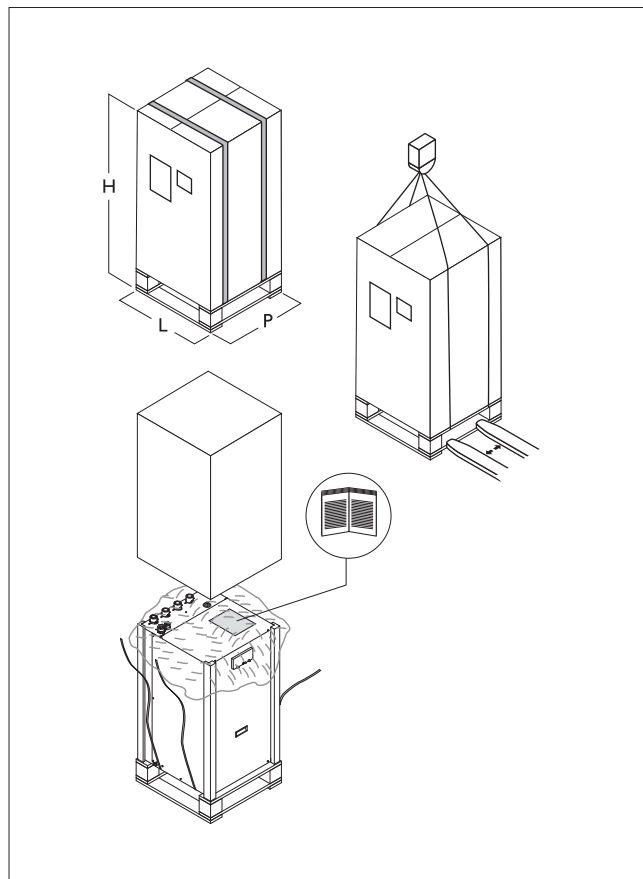
- instruction manual;
- guarantee certificate;
- CE declaration;
- After removing the packaging, the unit must be handled by qualified personnel only using equipment appropriate for the weight of the unit.

**⚠ The instruction manual** is an integral part of the unit and should therefore be read and kept carefully.

**The packaging should not** be removed until the unit is located in the installation site.

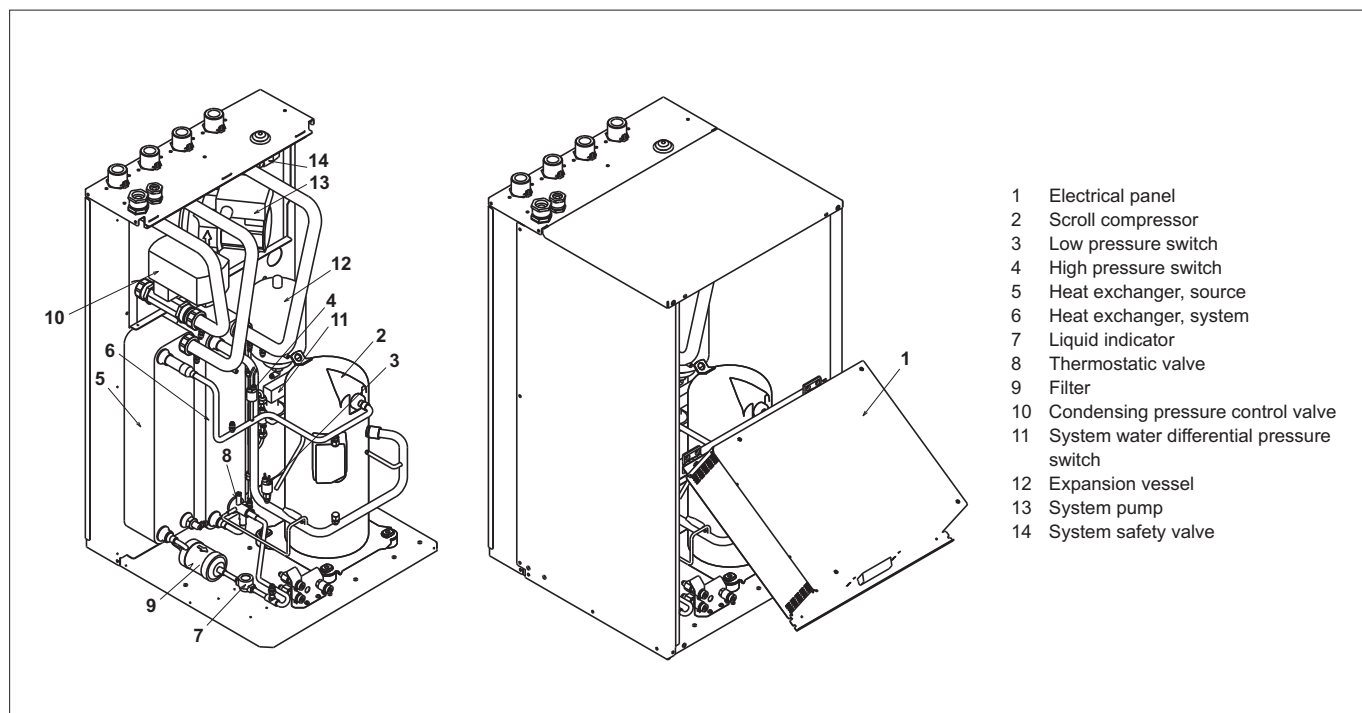
**During transport, the unit** should be kept in a vertical position.

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

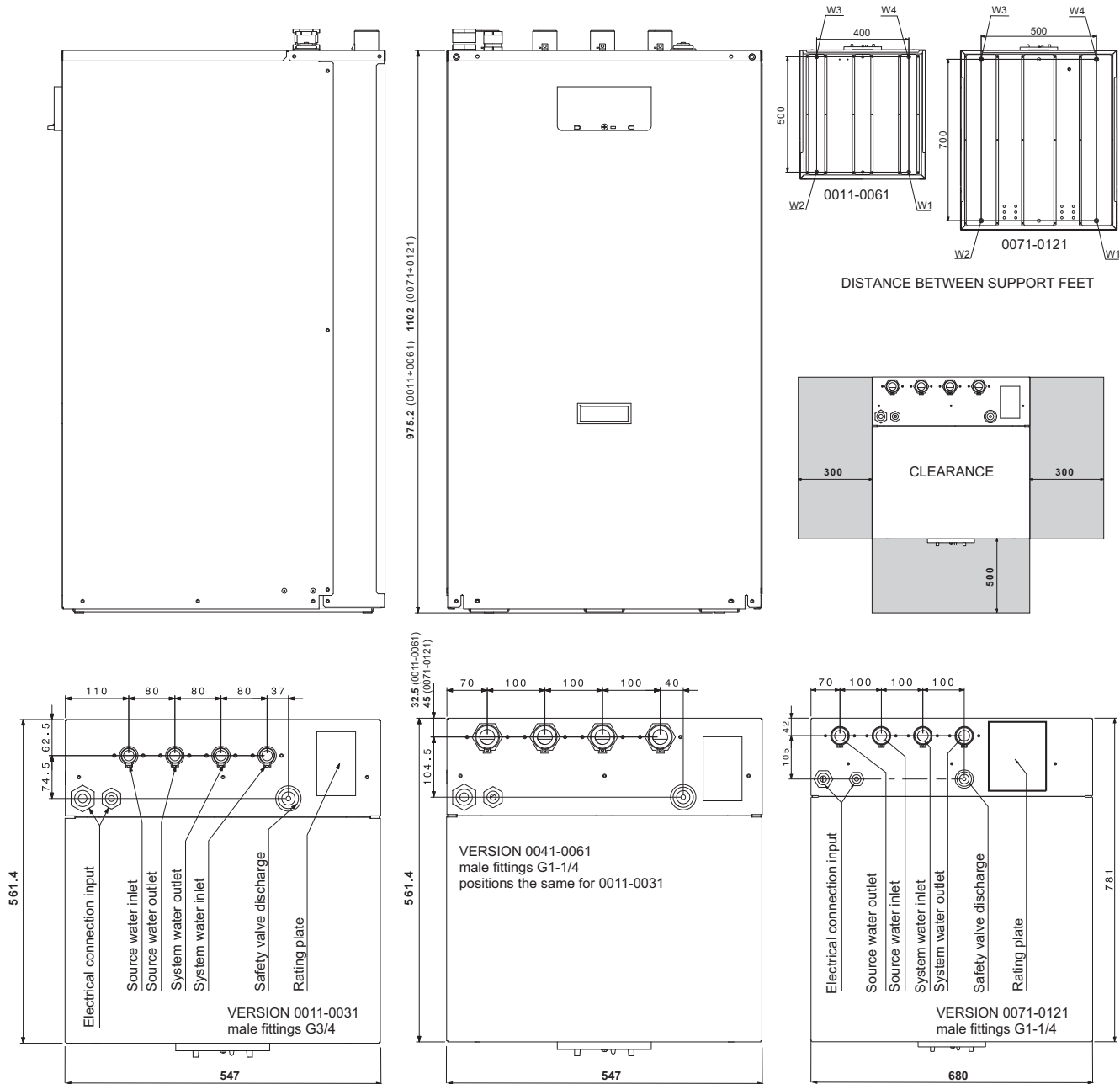


## GENERAL WARNINGS

The water-water units operate with R410A refrigerant fluid and are suitable for indoor installation. The units conform to the essential requisites of EEC directive 89/392. They are factory tested and on site installation is limited to water and electrical connections.



Dimensions in mm



Dimension		0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
L	mm	547	547	547	547	547	547	547	680	680	680	680
P	mm	561,4	561,4	561,4	561,4	561,4	561,4	561,4	781	781	781	781
H	mm	975,2	975,2	975,2	975,2	975,2	975,2	975,2	1102	1102	1102	1102

Weight distribution BRH FF		0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
W1 rear R	Kg	29	29	30	31	32	33	34	44	46	47	50
W2 rear L	Kg	36	36	37	37	39	41	43	53	55	56	60
W3 front L	Kg	38	38	38	38	40	42	44	55	58	59	63
W4 front R	Kg	45	45	45	46	49	54	54	68	71	73	78
total in operation	Kg	148	148	150	152	160	170	175	220	230	235	250
total for transport	Kg	158	158	160	162	170	180	185	230	240	245	260

Dimension		0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
Water connections IN/OUT	in	3/4"	3/4"	3/4"	3/4"	1"1/4	1"1/4	1"1/4	1"1/4	1"1/4	1"1/4	1"1/4

## 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 support surface is adequate to support the weight of the unit;
- respect safety distances between the unit and other equipment or structures.
- The unit must be installed in a space designed to house technical installations dimensioned according to legislation in force in the country concerned and large enough to allow access for maintenance.

## POSIZIONAMENTO

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

## 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 components must be installed in the water circuits:

1. Two pressure gauges with a suitable scale (intake and outlet);
2. Two vibration damper joints (intake and outlet).
3. Two shut off valves (normal in intake and calibrating in outlet).
4. **Two flow switches (outlet) on both circuits, in the system and source sections (compulsory). Both flow switches must be calibrated by the installer to a value equal to 70% of rated flow.**
5. Two thermometers (intake and outlet).
6. **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.**

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

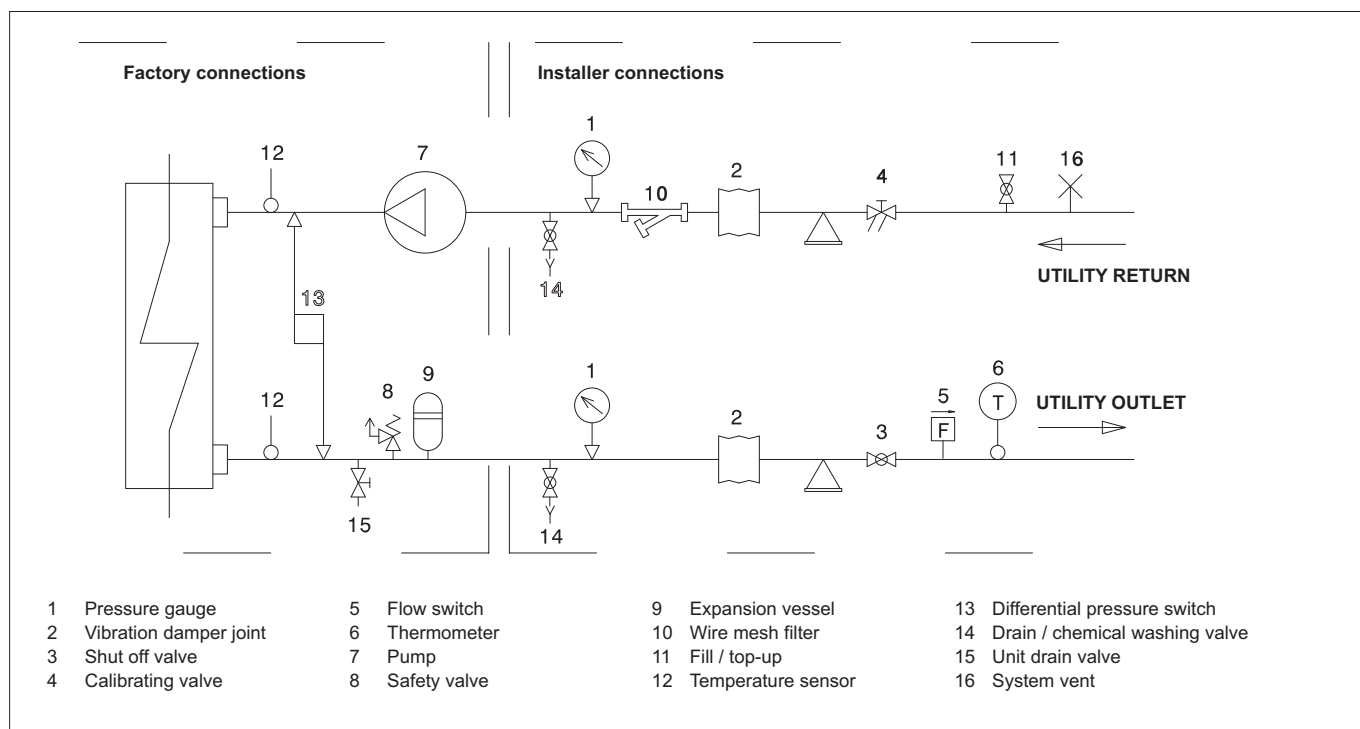
Specifically, this involves cleaning the filters and checking the operation of the flow switches installed.

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

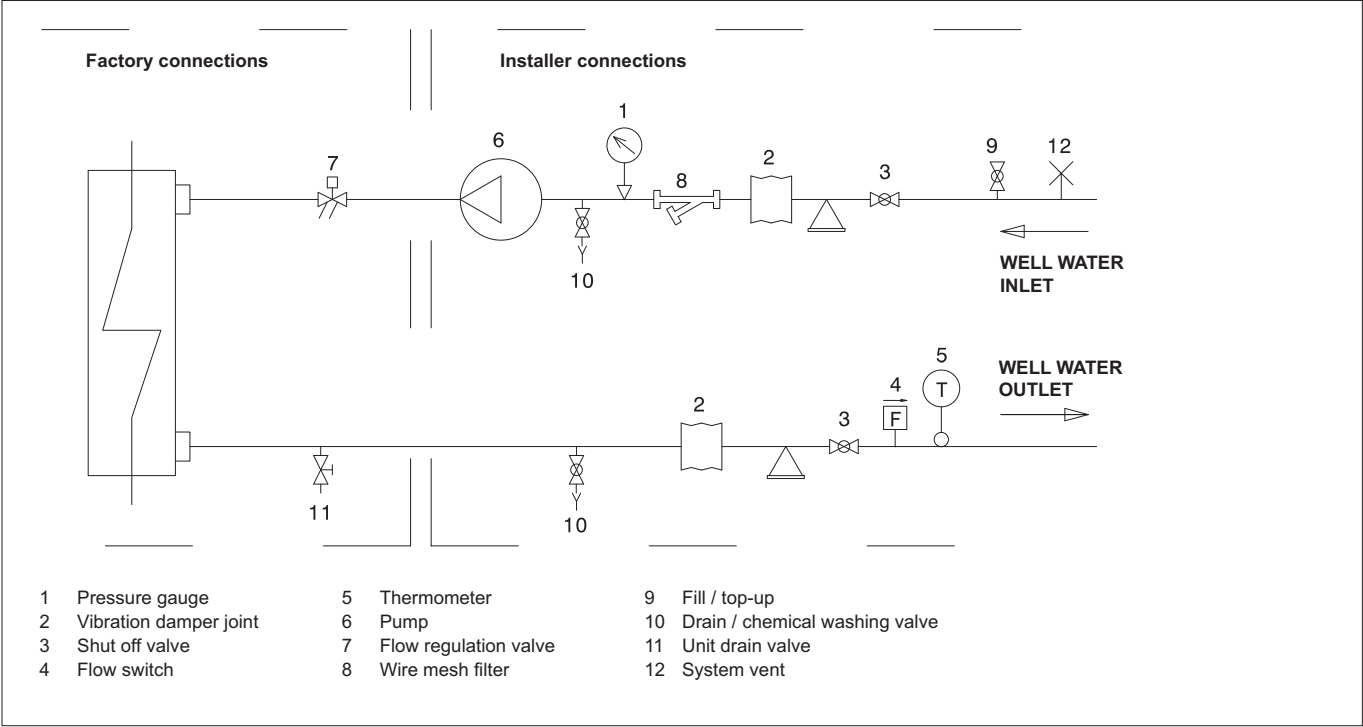
The flow of water must be maintained constant during operation. The water content of the unit must be such as to avoid disturbing operation of the refrigerant circuits.

Install any pressure regulating valves or solenoid valves on the external water outlet piping

Utility water circuit connection diagram



Heat exchange circuit water connection diagram



**⚠ The units** 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.

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.

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

## TO MAKE THE CONNECTIONS

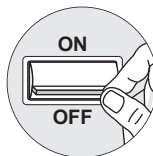
Remove the plastic caps protecting the water connections. Connect the system following the diagram.

⚠ To seal the threads, it is recommended to use hemp and joining paste. Teflon should not be used with antifreeze fluid.

⚠ Before connecting the pipes, make sure they do not contain stones, sand, rust, dross or other foreign bodies which might damage the unit.

## FILLING THE SYSTEM

- Before starting to fill, place the unit mains switch QF1 in the **OFF** position
- 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 valve 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 the rated pressure.

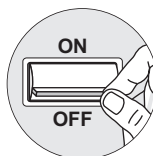


⚠ Check the tightness of the joints.

⚠ It is recommended that this operation be repeated after the unit has been operating for a number of hours. The pressure in the system should be checked regularly. Top-up with the unit off (pump off).

## EMPTYING THE SYSTEM

- Before starting to empty, place switch QF1 in the **OFF** position
- Make sure the system fill/top-up water valve is closed
- Open the drain valve outside the unit and all the vent valves on the unit and in the system, as well as the terminals.



⚠ 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.



## Water content in the system

Size		0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
Minimum water content BRH FF	I	27	30	37	44	56	67	80	100	115	130	170

## 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.

Add glycol to the water circuit if the unit is not used during the winter or the circuit is not emptied. **The ground source circuit must contain a water-glycol mixture with a minimum of 20% and a maximum of 40% ethylene glycol.**

## 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.

## Water content in the system

The water content on the system side must be a minimum of 3.5 litres per kilowatt, or higher.

### Freezing point (°C)

	0	-5	-10	-15	-20	-25
--	---	----	-----	-----	-----	-----

### Percentage of ethylene glycol in 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

Fouling factors	Evaporator		
(m <sup>2</sup> °C/W)	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

## SOUND PRESSURE

Size	Octave band (Hz)								Total dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level (dB)								
0011	51	41	40	39	36	33	27	30	41
0021	51	41	40	39	36	33	27	30	41
0025	56	46	45	44	41	37	31	33	42
0031	56	46	45	44	41	37	31	33	42
0041	62	52	51	50	47	43	37	39	47
0051	62	52	51	50	47	43	37	39	47
0061	62	52	51	50	47	43	37	39	48
0071	62	52	51	50	47	43	37	39	55
0091	62	52	51	50	47	43	37	39	55
0101	64	54	52	51	49	44	38	40	59
0121	64	54	52	51	49	44	38	40	59

Reference point: in open field at 1 m from the surface of the unit on the coil side and 1 m above the support surface.

## ELECTRICAL CONNECTIONS

The units leave the factory fully wired. Installation is limited to connection to the mains electrical supply and connection of the flow switch and chiller thermal overload switch QF1 (refer to the wiring diagrams).

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 (plumbing and electrical) has been completed.

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

**Voltage** must be within a tolerance of ±10% of the rated

power supply voltage for the unit (for three phase units, the unbalance between the phases must not exceed 3%). 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 where the chiller is installed.

**A thermal overload 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.

**If these devices are not visible** from the electrical panel of the unit, they should 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 in the correct sequence.

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

## Electrical data

Model	Power supply	Total			Fuses (5x20T 250V)				
		F.L.I.	F.L.A.	L.R.A.	FU1	FU2	FU3	FU4	FU5
	(V-Ph-Hz)	(kW)	(A)	(A)					
BRH 0011 FF	230~50	3,5	17,0	58	1A	1A	8A	0.5A	3,15A
BRH 0021 FF	230~50	3,6	17,0	61	1A	1A	8A	0.5A	3,15A
BRH 0025 FF	230~50	4,0	20,0	82	1A	1A	8A	0.5A	3,15A
BRH 0031 FF	230~50	4,8	24,0	97	1A	1A	8A	0.5A	3,15A
BRH 0041 FF	230~50	4,6	29,1	130	1A	1A	8A	0.5A	3,15A
BRH 0021 FF	400-3N~50	3,2	6,5	32	1A	1A	8A	0.5A	3,15A
BRH 0025 FF	400-3N~50	4,4	7,0	35	1A	1A	8A	0.5A	3,15A
BRH 0031 FF	400-3N~50	4,2	9,0	48	1A	1A	8A	0.5A	3,15A
BRH 0041 FF	400-3N~50	5,6	12,1	64	1A	1A	8A	0.5A	3,15A
BRH 0051 FF	400-3N~50	6,8	13,9	64	1A	1A	8A	0.5A	3,15A
BRH 0061 FF	400-3N~50	8,6	17,1	75	1A	1A	8A	0.5A	3,15A
BRH 0071 FF	400-3N~50	9,06	18,3	101	1A	1A	8A	0.5A	3,15A
BRH 0091 FF	400-3N~50	11,1	23,1	111	1A	1A	8A	0.5A	3,15A
BRH 0101 FF	400-3N~50	12,0	26,0	118	1A	1A	8A	0.5A	3,15A
BRH 0121 FF	400-3N~50	17,2	36,1	140	1A	1A	8A	0.5A	3,15A

F.L.I. Maximum power input

F.L.A. Maximum current input

L.R.A. Start-up current

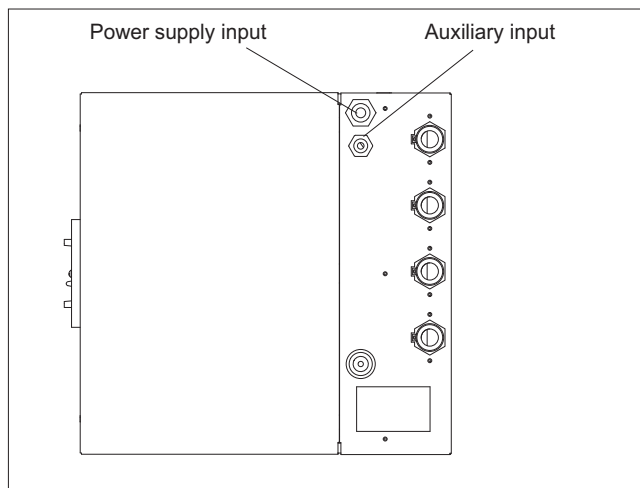
## Bringing electrical power cables into the unit and external connections

The unit is provided with cable glands for bringing electrical power cables and other connection wires into the appliance. Thread the wires from outside, guiding them in the direction of the electrical panel.

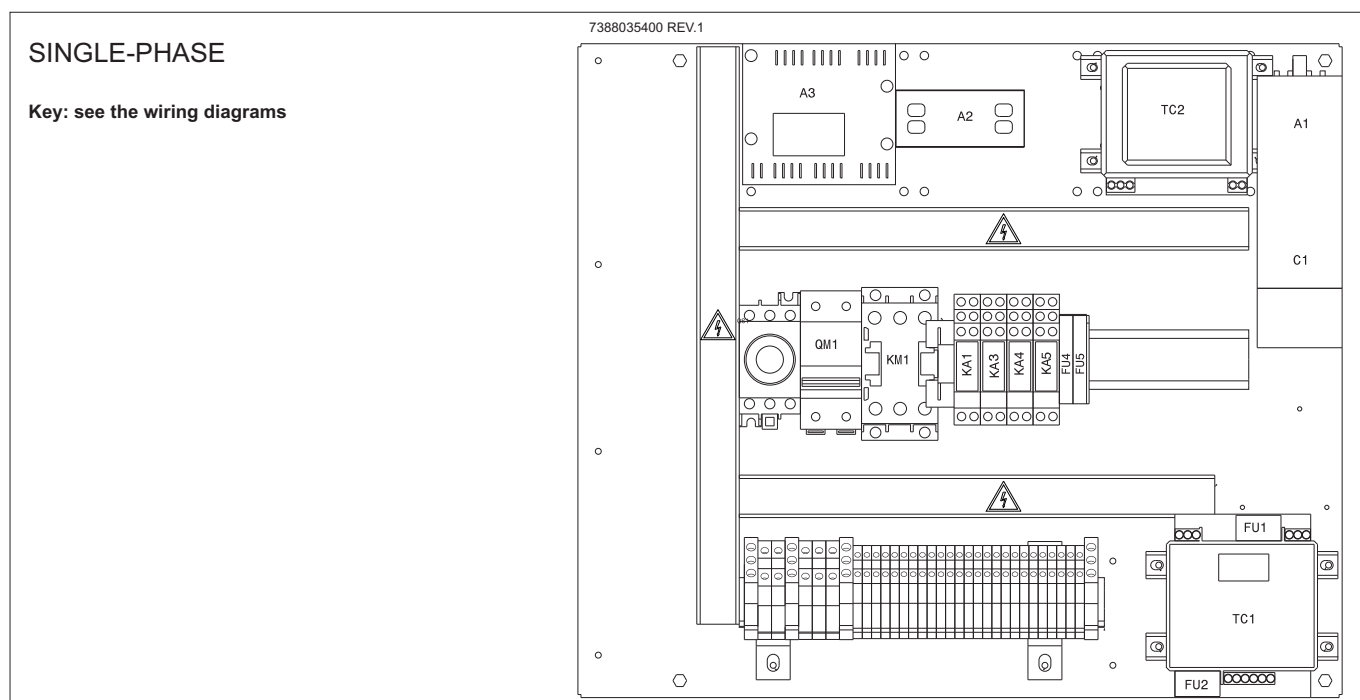
⚠ The cable glands are located near the compressor and fixed with a clamp.

Electrical cables must not enter the unit in positions not specifically described in this booklet.

⊘ Avoid direct contact with non-insulated copper piping and the compressor



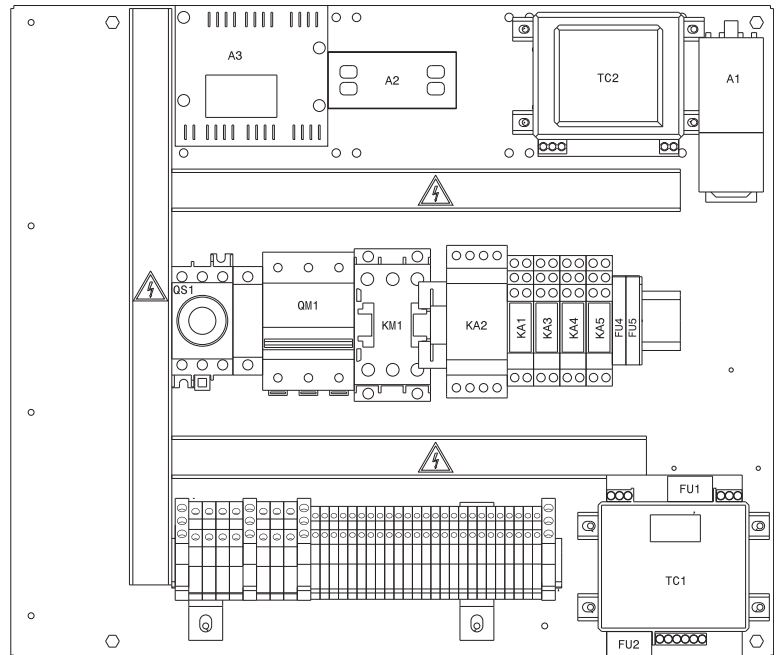
## ELECTRICAL PANEL BRH FF



## THREE-PHASE 0021 - 0061

Key: see the wiring diagrams

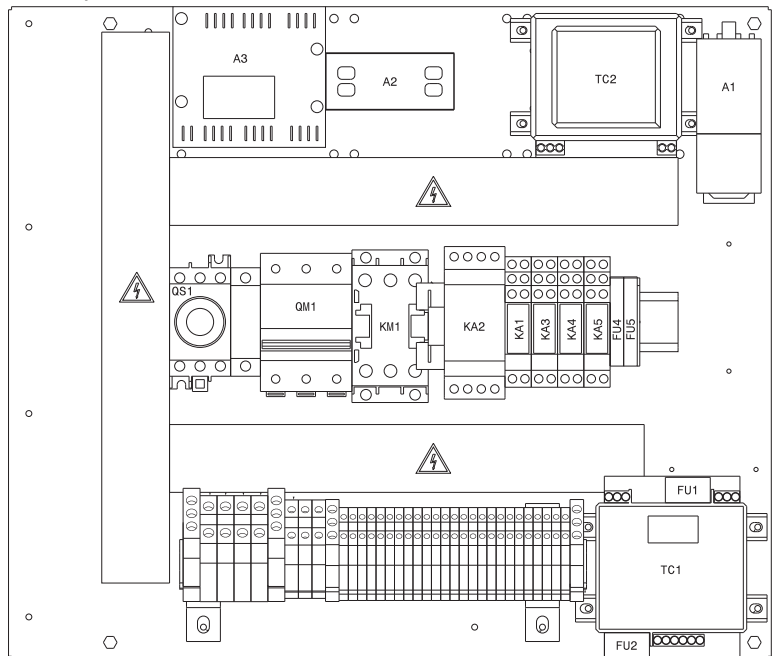
7390013200



## THREE-PHASE 0071 - 0121

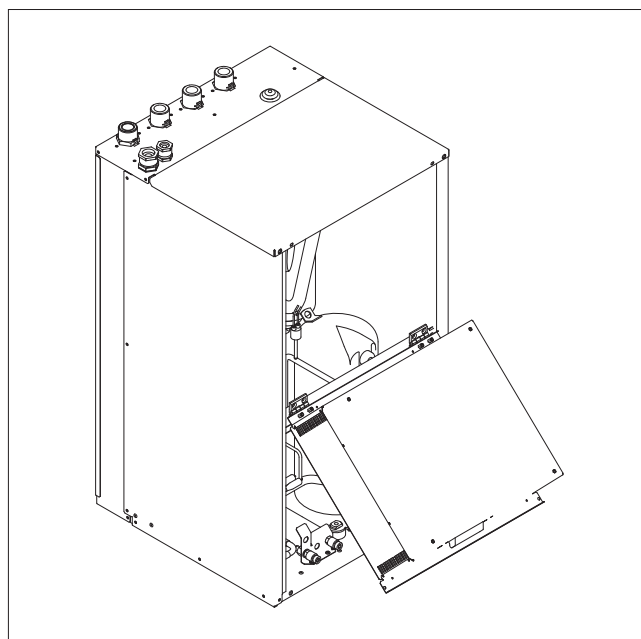
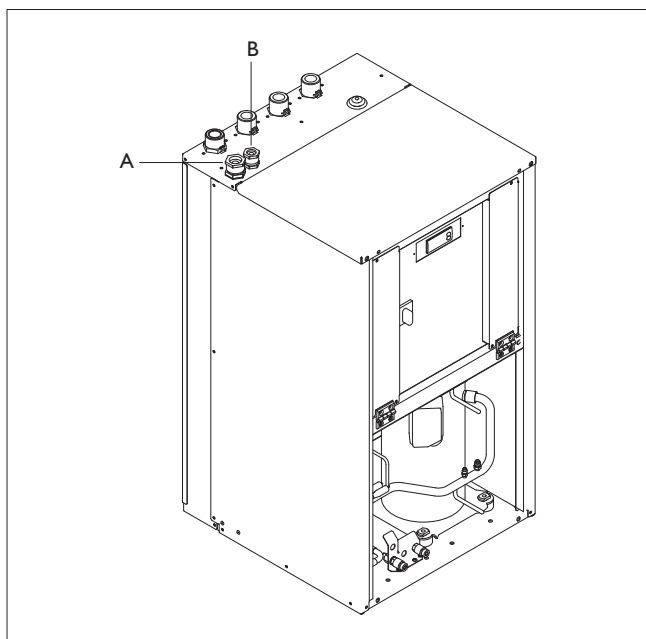
Key: see the wiring diagrams

7390013600



### To complete the electrical connections:

- Open the electrical panel, as shown in the figure.
- Use cable gland **A** for the main electrical power cable and cable gland **B** for other external cables.
- Remove the protective cover from the main switch.



### MAINS POWER SUPPLY CONNECTIONS

For the functional connection of the unit, bring the power supply cable to the electrical panel inside the unit and connect it to terminals U-N and PE, respecting the (U) phase, (N) neutral and (PE) earth in the case of single phase units (230V~50Hz), or U-V-W phases, N neutral and PE earth in three phase units (400V-3N~ 50 Hz).

### AUXILIARY CONNECTIONS

All the terminals referred to in the following explanations are to be found on the terminal board located inside the electrical panel and called "installer terminals".

### REMOTE ON/OFF

To fit a remote on/off device, connect an external contact to terminals 16 and 17 on the installer terminal block, and set parameter CL42 to -1 (CL42=-1).

For timed operation, connect a daily or weekly timer between terminals 16 and 17.

### REMOTE ALARM

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 12 and the alarm signal device between terminal 13 and the neutral (max. applicable load: 500mA at 24V).

### REMOTE KEYPAD KIT

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:

- disconnect the power supply and then access the inside of the electrical panel (using door lock disconnect switch QS1);
- connect the remote control module with 3 wires to terminals 26, 27 and 28 on the installer terminal board;
- terminal 26 connected to GND terminal on the module;
- terminal 27 connected to Signal terminal on the module;
- terminal 28 connected to +12V terminal on the module.

### FLOW SWITCH CONNECTIONS

The system flow switch must be connected to terminals 20 and 21. The source flow switch must be connected to terminals 22 and 23.

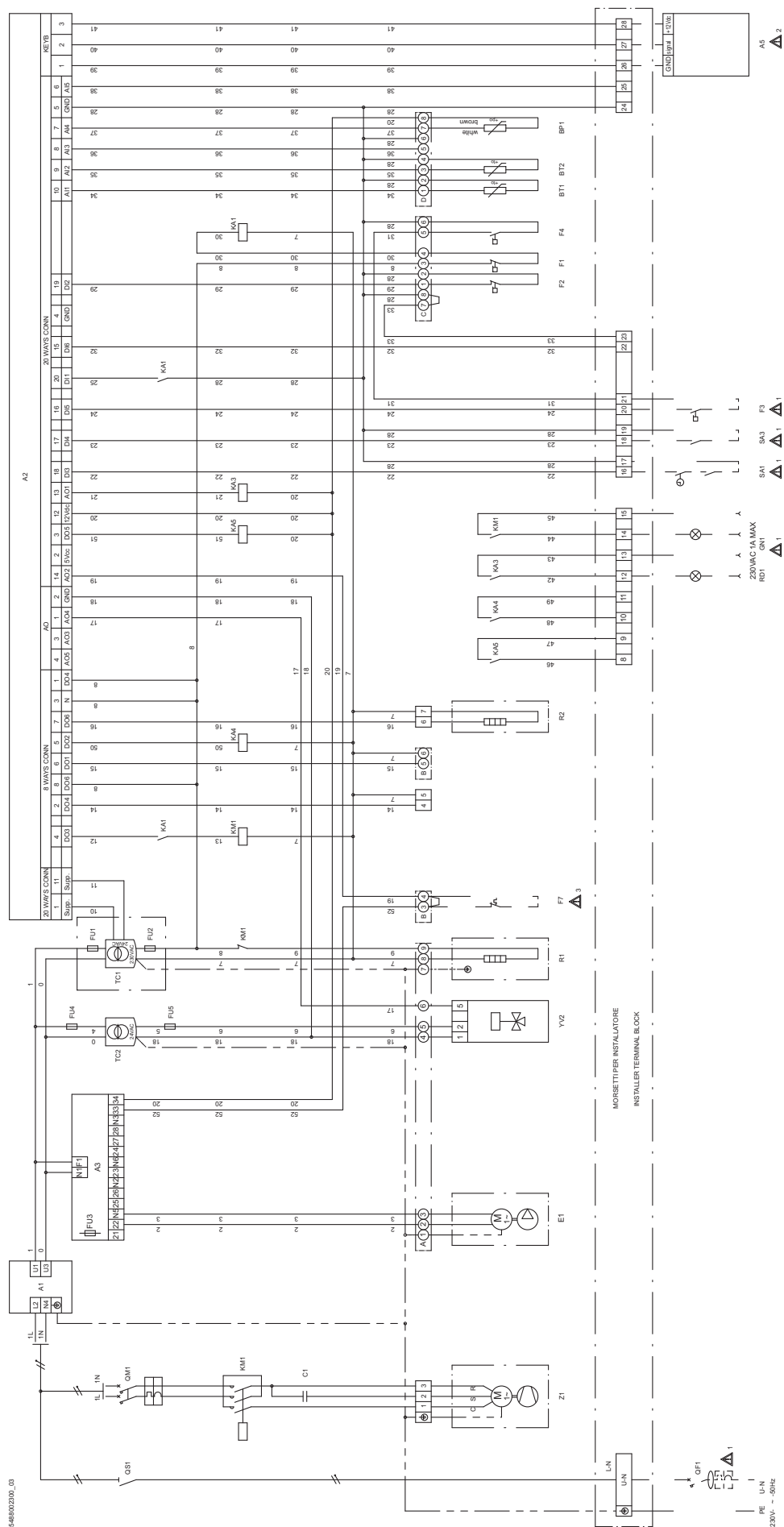
If not connected, the unit will not be able to operate, and the controller will display alarm code ER20 and ER25 (see "Displaying the alarms").

### DIGITAL INPUT FOR ECONOMY FUNCTION

To enable the ECONOMY function, connect an external contactor to terminals 18 and 19 on the installer terminal block, and set the following parameters

- CL43 to 22
- Tr 15 to the desired offset value in COOLING mode
- Tr25 to the desired offset value in HEATING mode

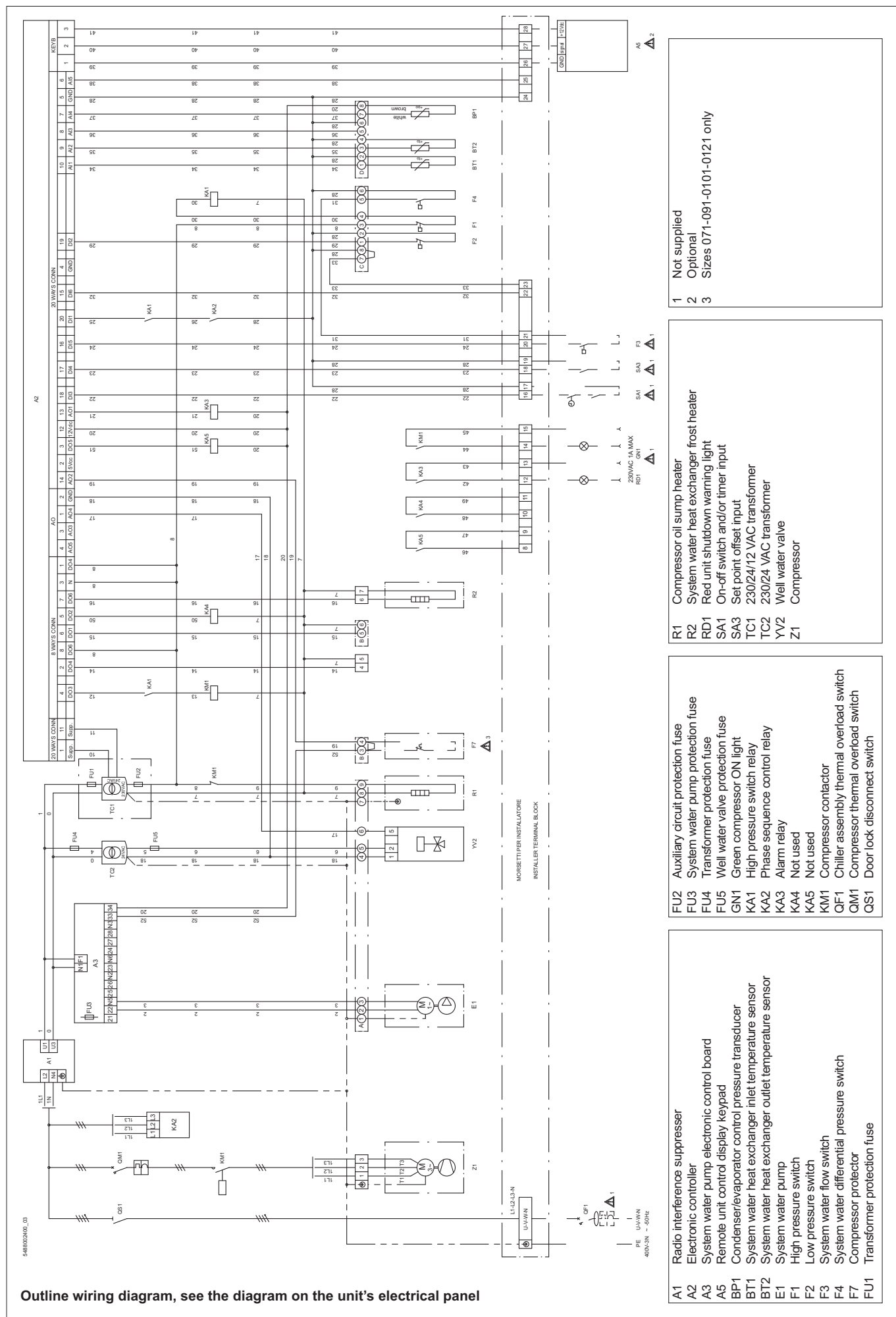
# SINGLE-PHASE WIRING DIAGRAM



Outline wiring diagram, see the diagram on the unit's electrical panel

A1	Radio interference suppressor
A2	Electronic controller
A3	System water pump electronic control board
A5	Remote unit control display keypad
BP1	Condenser/evaporator control pressure transducer
BT1	System water heat exchanger inlet temperature sensor
BT2	System water heat exchanger outlet temperature sensor
C1	Compressor start capacitor
E1	System water pump
F1	High pressure switch
F2	Low pressure switch
F3	System water flow switch
F4	System water differential pressure switch
F7	System pump thermal overload
FU1	Transformer protection fuse
FU2	Auxiliary circuit protection fuse
FU3	System water pump protection fuse
FU4	Transformer protection fuse
FU5	Well water valve protection fuse
GN1	Green compressor ON light
KA1	High pressure switch relay
KA3	Alarm relay
KA4	Not used
KA5	Not used
KM1	Compressor contactor
QF1	Chiller assembly thermal overload switch
QM1	Compressor thermal overload switch
QS1	Door lock disconnect switch
R1	Compressor oil sump heater
R2	System water heat exchanger frost heater
RD1	Red unit shutdown warning light
SA1	On-off switch and/or timer input
SA3	Set point offset input
TC1	230/24/12 VAC transformer
TC2	230/24 VAC transformer
YV2	Well water valve
Z1	Compressor
1	Not supplied
2	Optional
3	Sizes 31-41-51-61 only

# THREE-PHASE WIRING



BRH FF			0011	0021	0025	0031	0041	0021	0025	0031
Cooling capacity (1)		kW	5,5	6,9	7,6	9,2	11,9	5,9	7,7	9,3
Max. total power input (1) (2)		kW	1,5	1,7	2,0	2,6	3,2	1,6	1,9	2,4
Utility evaporator water flow-rate (1)		m³/h	1,0	1,1	1,3	1,6	2,1	1,1	1,4	1,7
Well/tower water flow-rate (1)		m³/h	0,4	0,4	0,5	0,6	0,8	0,4	0,5	0,6
Refrigerant R410A		kg	0,90	1,05	1,25	1,35	1,48	1,05	1,25	1,35
Oil Mobil EAL Arctic22cc*		kg	1,1	1,1	1,25	1,25	1,66	1,1	1,24	1,25
Unit weight in operation		kg	148	148	150	152	160	148	150	152
Water connections in/out Gas		inches	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
Sound pressure level (3)		dB(A)	41	41	42	42	47	41	42	42
Maximum allowable pressure PS (3)	H	bar	39,3	39,3	39,3	39,3	39,3	39,3	39,3	39,3
	W	bar	28	28	28	28	28	28	28	28
Type of compressor			Scroll							
Number of compressors		no.	1	1	1	1	1	1	1	1
Number of circuits		no.	1	1	1	1	1	1	1	1
Capacity steps		no.	1	1	1	1	1	1	1	1
Electrical power supply		V/ph/Hz	230~50					400-3N~50		

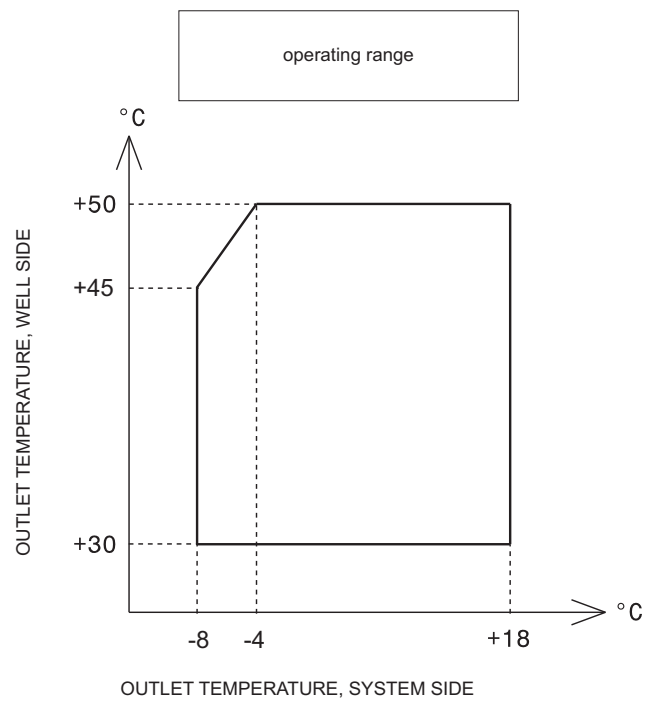
BRH FF			0041	0051	0061	0071	0091	0101	0121
Cooling capacity (1)		kW	12,4	13,9	16,5	20,8	24,0	27,3	35,1
Max. total power input (1) (2)		kW	3,2	3,8	4,0	5,1	5,8	6,8	8,4
Utility evaporator water flow-rate (1)		m³/h	2,2	2,4	2,9	3,6	4,2	4,8	6,1
Well/tower water flow-rate (1)		m³/h	0,8	0,9	1,1	1,4	1,6	1,8	2,3
Refrigerant R410A		kg	1,48	1,55	1,75	1,95	2,15	2,55	2,95
Oil Mobil EAL Arctic22cc*		kg	1,66	1,65	2,50	1,77	3,20	3,25	3,25
Unit weight in operation		kg	160	170	175	220	230	235	250
Water connections in/out Gas		inches	1"1/4	1"1/4	1"1/4	1"1/4	1"1/4	1"1/4	1"1/4
Sound pressure level (3)		dB(A)	47	47	48	55	55	59	59
Maximum allowable pressure PS (3)	H	bar	39,3	39,3	39,3	39,3	39,3	39,3	39,3
	W	bar	28	28	28	28	28	28	28
Type of compressor			Scroll						
Number of compressors		no.	1	1	1	1	1	1	1
Number of circuits		no.	1	1	1	1	1	1	1
Capacity steps		no.	1	1	1	1	1	1	1
Electrical power supply		V/ph/Hz	400-3N~50						

(1) values for system 12-7°C well 30-35°C

(2) includes compressor and system pump

(3) measured at 1 m in open field





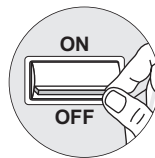
DT SYSTEM SIDE, MINIMUM 3°C MAXIMUM 8°C  
DT WELL SIDE IN CHILLER OPERATION, MINIMUM 3°C MAXIMUM 21°C

**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:

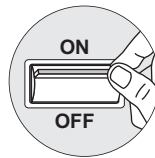
- All safety conditions have been respected
- The unit is adequately fixed to the surface it rests on;
- Functional distances have been respected;
- Water connections have been carried out as indicated in the instruction manual;
- The water circuit is filled and vented;
- The water valves are open;
- 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 to ON (see "wiring diagram" and the control panel in standby) to allow the oil in the compressor sump to heat up.

**STARTING UP FOR THE FIRST TIME (after 2 hours)**

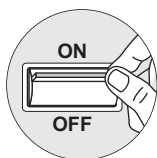
Before starting the chiller:

- 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).
- Make sure the remote keypad "A5" is OFF (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 (⏻ symbol) lights up on the control panel, indicating power is connected.

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

**ACTIVATING AND DEACTIVATING THE UNIT**

- Move the contact on the on/off device SA1 (if featured) to ON.
- Switch the remote keypad "A5" (if featured) ON.

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

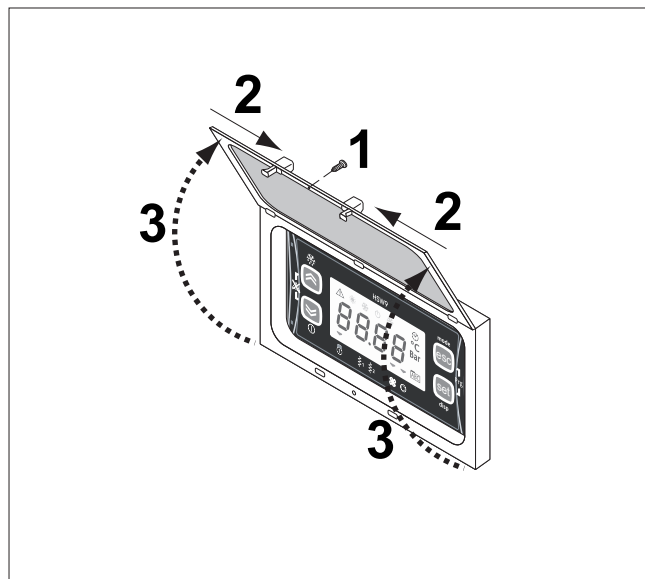
- ER20 check the water flow-rate and the connection (terminals 20-21 and 22-23) of the flow switch/switches.
- ER01 (three-phase heat pumps only): check the power supply connection and if necessary reverse two phases.

⚠ 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.

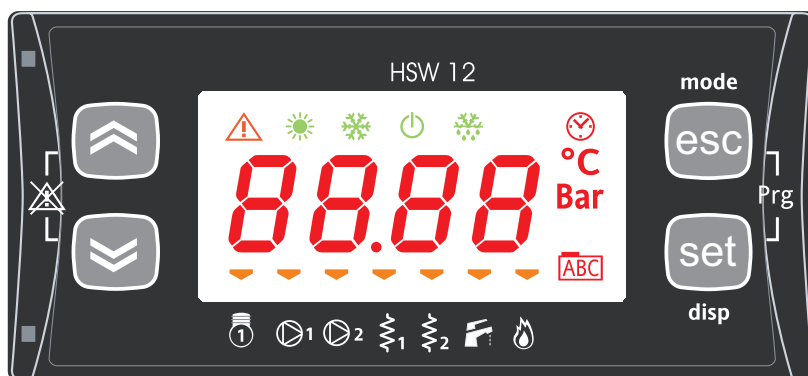
Make sure the voltage is within the established limits and that, for three phase units, the unbalance between the phases is less than 3%.

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



To access the control panel, open the door:

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

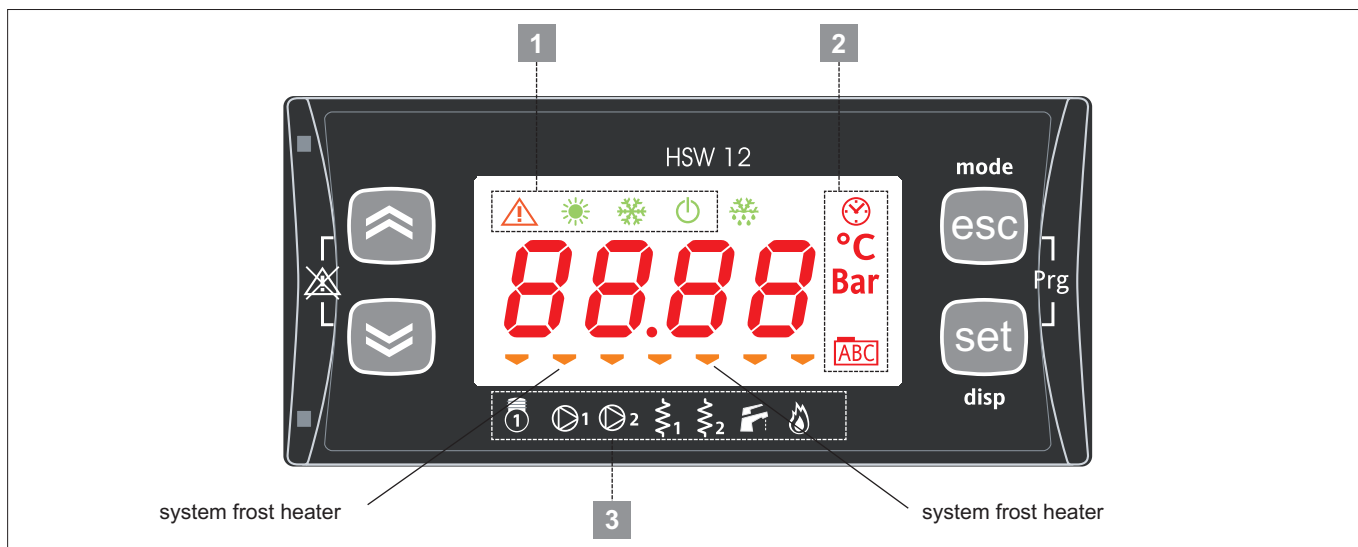


## DESCRIPTION OF THE BUTTONS AND ASSOCIATED FUNCTIONS

Button	Description	Pressed once (press and release)	Associated function	Pressed and held [for around 3 seconds]	Menu / Notes
	<b>UP</b>	<ul style="list-style-type: none"> <li>- Increase a value</li> <li>- Go to the next label</li> </ul>			Vedi anche Menu funzioni capitolo Funzioni (cartella FnC)
	<b>DOWN</b>	<ul style="list-style-type: none"> <li>- Decrease a value</li> <li>- Go to the previous label</li> </ul>			
	<b>Esc(ape) Exit</b> (Without saving the new settings)	<ul style="list-style-type: none"> <li>- Exit without saving settings</li> <li>- Return to previous level</li> </ul>	<b>mode</b>	[Change mode] See Selecting the operating mode	Operating mode menu
	<b>Set - Confirm</b> (saving the settings)	<ul style="list-style-type: none"> <li>- Confirm value / exit and save settings</li> <li>- Go to the next level (access to directory, subdirectory, parameter and value)</li> <li>- Access the Status menu</li> </ul>	<b>disp</b>	[Main display] See Main display	[Main display menu]
	<b>ALL</b>	<ul style="list-style-type: none"> <li>- Mute alarms</li> </ul>			See Muting and manually resetting the alarms

## DESCRIPTION OF THE BUTTONS - COMBINED ACTION

Symbol [function associated with the combined action of the buttons]	Combination of buttons	Combined action of the buttons Pressed once (press and release)	[associated function]	[Menu] / Notes
		<b>[UP + DOWN]</b>		[Manual reset]
Prg		<b>[Esc + Set]</b>	[Enter Programming menu]	[Programming menu]



### 1 STATUS AND OPERATING MODE LEDs

	Alarm
	Not used
	Cooling
	Standby
	Not used

### 2 VALUE AND UNIT OF MEASURE LEDs

	Clock (RTC)
	Degrees centigrade
	Pressure (Bar)
	Menu (ABC)

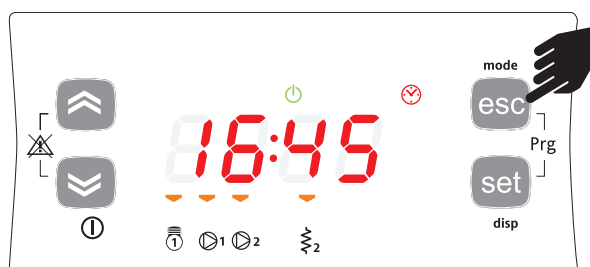
### 3 UTILITY LEDs

	Compressor
	Source valve
	System pump
	Not used
	System frost heater
	Not used
	Not used

## SELECTING THE OPERATING MODE

There are two different modes:

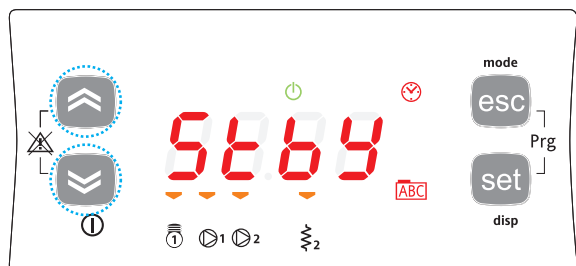
- Standby mode (StbY)
- Cooling mode (COOL)



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

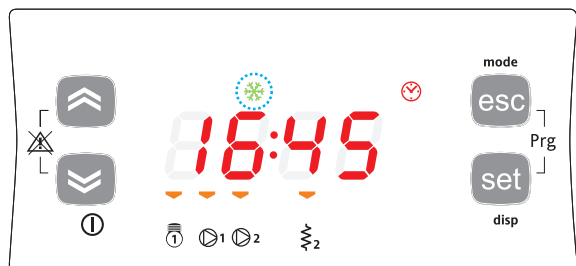
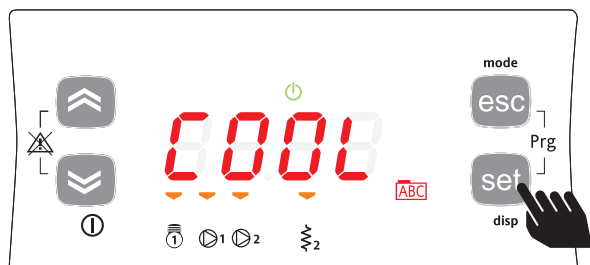
To change the operating mode, press and hold the mode button for at least 2 seconds.

PS: The main display is set as RTC (current time).



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

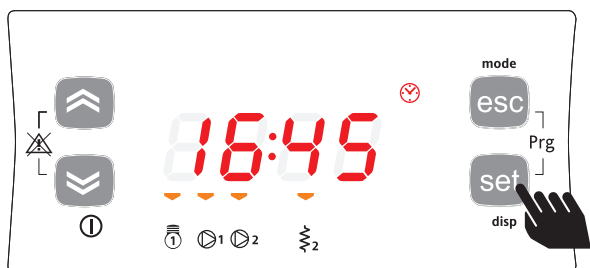
Use the up and down buttons to select the desired operating mode.



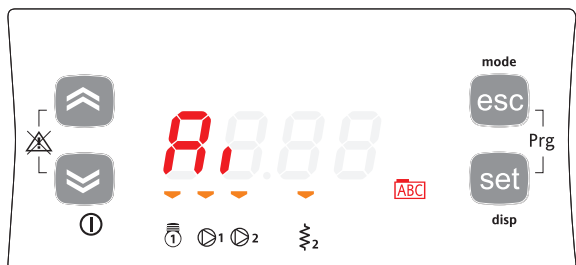
The unit will automatically return to the main display and the Stby LED, previously on, will now be off and the COOL LED will be on.

## SETTING THE SET POINTS

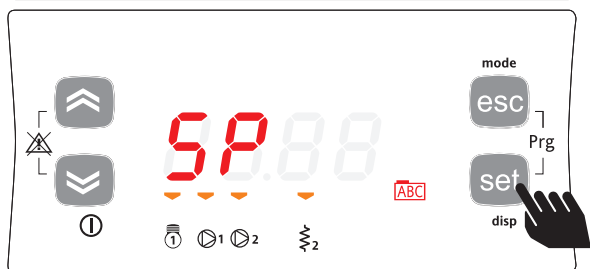
As an example, the Set Point in COOL mode will be changed from 12.0 degrees centigrade to 12.5 degrees centigrade.



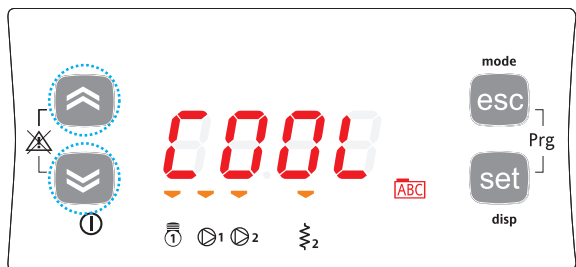
To change the set point, starting from the main display, press the set button.



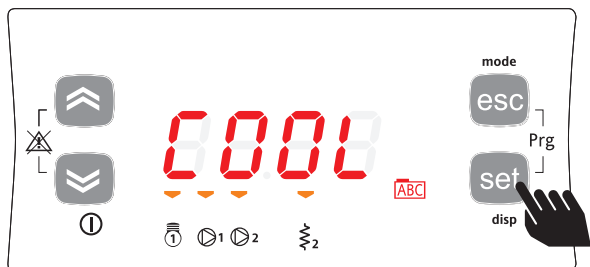
Pressing the set button once displays the various directories. Scroll the menu using the up and down buttons until reaching the SP directory.



To enter the SP directory press the set button.



The active mode will be displayed (COOL).



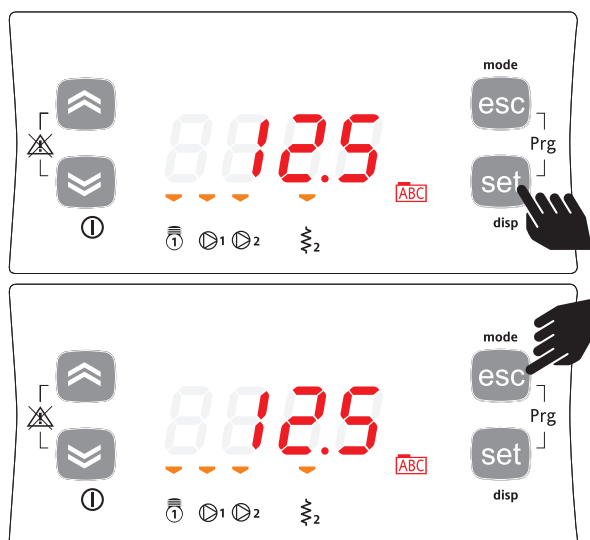
Taking the example of changing the set point for the operating mode. Press the SET button.



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.

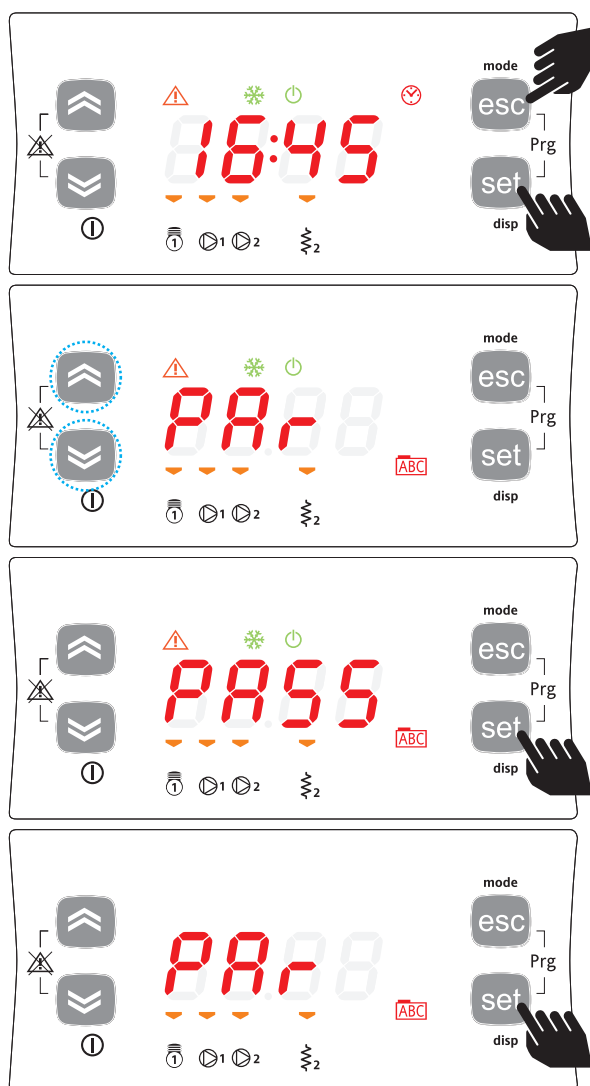


Once having reached the desired set point, press the set button. In this way, the instrument will save the value 12.5.

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.

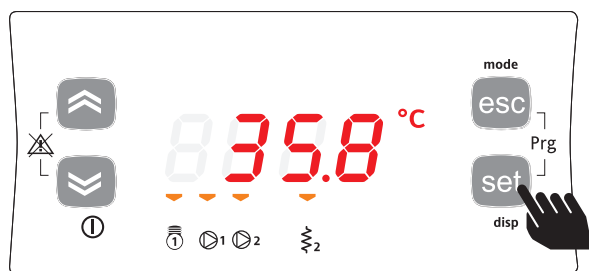
When having selected the value, press the set button. \*\*

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.

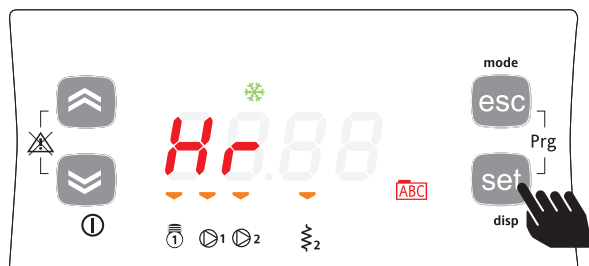


## DISPLAYING AND RESETTNG COMPRESSOR/PUMP HOURS

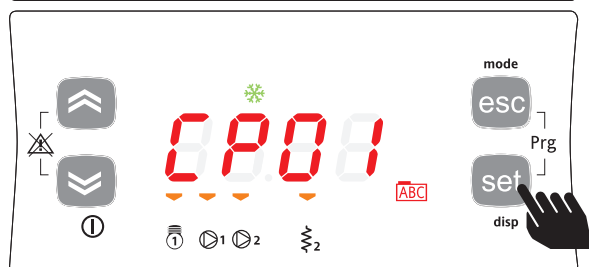


Example of displaying and resetting (tens) the operating hours for Pump 2.

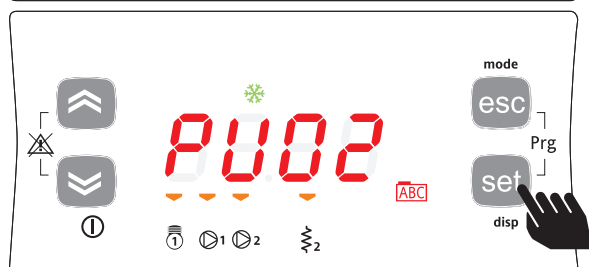
From the main display, press the set button.



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

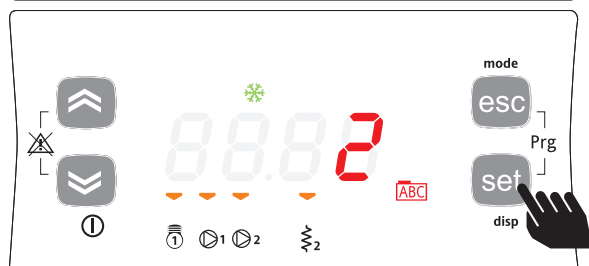


Press the set button to display the first label, in this case the operating hours for compressor 1 (CP01).



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 pumps (PU01, PU02).

Press the set button to display the operating hours for 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 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
Source valve	FE	FE00... FE30	Modulating 2-way valve in source circuit
Electric heaters	HI	HI00... H15	Electric heaters, primary heat exchanger
	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 table above 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 in one hour	Check the fault
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 Er 25	Well water flow switch tripped Manual reset if active for more than 30 seconds	Check insufficient water flow-rate 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 Er45	Clock fault error (automatic reset)	Replace controller
Display indication Er46	Clock to be set error (automatic reset)	Set date and time

FAULT	CAUSE	SOLUTION
<b>Display indication Er47</b>	HSW12 communication error with remote keypad (only if remote keypad featured)	Check electrical connection
<b>Values display indication Er60</b>	Faulty BT1 system water return sensor (automatic reset)	Check electrical connections Replace component
<b>Values display indication Er61</b>	Faulty BT2 system water outlet sensor (automatic reset)	Check electrical connections Replace component
<b>Display indication Er75</b>	Pressure transducer malfunction	Check electrical connection (see unit wiring diagrams) Replace the component
<b>Display indication Er81</b>	Compressor maintenance interval	Check operating pressure Check condition of the compressor Reset the clock
<b>Display indication Er85</b>	Water pump maintenance interval	Check condition of the water pumps Reset the clock
<b>Display indication Er90</b>	Maximum alarm log size exceeded	Reset alarm log

**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.

**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 has an output for managing the circulating pump, which starts when "cool" mode is activated and stops a few seconds after the unit goes to "standby". 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).

**ALLARME ANTIGELO**

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

Il riarmo è manuale.

**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 seconds. If it lasts longer, it must be reset manually.

**SHUTTING DOWN FOR LONG PERIODS****A**

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.

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

**Terminals 12, 13, 14 and 15** 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 input

- 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.

## SPECIAL MAINTENANCE

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

**Terminals 12, 13, 14 e 15** 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 R410A 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 vacuum meter 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 R410A 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 R410A 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.

FAULT	CAUSE	SOLUTION
<b>The chiller doesn't start</b>	No voltage	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 thermal overload switch OFF	Switch ON
	Supply voltage too low	Check power line
	Contactor coil faulty HSW12 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
	Thermal protector 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 content	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 refrigerant content	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