

installation and maintenance manual

FOR THE INSTALLER AND THE USER

AURAX 2T 22 to 93 kW

HIGH EFFICIENCY AIR TO WATER HEAT PUMP

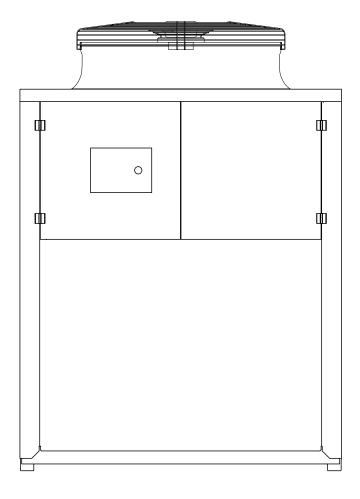


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Liabilities of the Manufacturer, the Installer and the End user

Manufacturer

Our products are manufactured in compliance with the requirements of the applicable European Directives and standards, and are therefore delivered with all the required documentation and markings.

The quality of our products is essential to us, and we aim therefore at improving them continually. To this end, we reserve the right to change the technical characteristics and features of our products without prior notice. Please check for the latest revision of the manual on our website (www.myaic.eu).

The manufacturer shall not be held liable for any malfunction of the product resulting from:

- > The failure to comply with the safety and installation instructions provided herein,
- > The failure to comply with the safety and operation instructions and recommendations provided herein,
- > The failure to have the appliance maintained regularly,
- A modification of the appliance that is not approved by the manufacturer,
- The use the product for any other purpose than its intended use,
- The use of components and accessories that are not approved by the manufacturer.

Installer

The installer is responsible for the correct installation, conversion (as required) and commissioning of the appliance according to:

- > The instructions and recommendations provided herein
- > The applicable regulations and standards

The installer shall provide the end-user with:

- Any relevant explanation about the operation of the appliance and the heating system as well as the safety devices that are provided,
- Any instruction regarding periodic checks to be performed and possible anomaly to be reported
- > All the documentation delivered with the appliance and installed accessories.

The installer shall also inform the end-user of the necessity to have the appliance checked and maintained regularly by a qualified professional.

End-user

To ensure the best performances and safety of the appliance, the end-user shall:

- Make sure that the appliance is installed, converted (as required), commissioned and adjusted by a qualified professional,
- Make sure that the appliance is checked and maintained regularly by a qualified professional,
- Comply with all the instructions and recommendations provided in the appliance documentation,
- Make sure to receive from the installer all the necessary explanations related to the operation of the appliance and the safety devices,
- Make sure to receive from the installer all the appliance and accessories documentation.
- > Keep all the appliance documentation in a safe place for future use.

The end-user shall use the product for its intended use.



- > Should the installer or the end user not comply with the instructions and requirements stated in this manual, the warranty will be void.
- For more information on the warranty terms and conditions, please connect to our website: www.myaic.eu.

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About this Manual

This documentation is part of the product. It will be handed over to the end-user who will keep it. with all the other applicable documents, in a safe place and readily available for use.

Before installing, operating or maintaining the unit, please carefully read this manual and all the applicable documents provided with the components and accessories. They contain essential safety information.

Safety message symbols



Indicates an essential instruction which, if not followed, can result in a hazardous situation that can cause serious damage to equipment and/or injuries or death.



Indicates an essential instruction in relation with the presence of electrical power and a danger of electrical shock.



Indicates an important instruction which, if not followed, could result in a hazardous situation that could cause damage to equipment and/ or injuries.



Indicates important information.

Safety-related symbols



High Voltage - danger of electric shock.



Moving parts - risk of being crushed or torn.



Hot surface - risk of burns.



Sharp surface - risk of cuts.



Dangerous substance - risk of damage or injuries.



Fire hazard



Wear safety shoes



Wear safety gloves



Wear safety glasses



Wear ear protections



Wear respiratory protection



Use fire-fighting equipment

Operation-related symbols



Heating circuit supply connection.



Heating circuit return connection.



Ground / Earth.



The electrical supply to the appliance must be activated/deactivated through the external circuit breaker or the power supply cable must be connected/disconnected.



The unit must be started/stopped using the ON/OFF function of the control panel.



Refrigerant circuit must be full/empty.



The water circuit must be full of water/emptv.



The access panel(s) of the appliance must be open/closed.

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General Safety Instructions



THIS UNIT CONTAINS REFRIGERANT AND OIL WHICH ARE POTENTIALLY HAZARDOUS TOXIC SUBSTANCES

- > Use care to handle such substances make sure to wear protective personal equipment.
- Avoid contact with the eyes and the skin.
- Ensure correct ventilation to avoid refrigerant vapour concentrations close to the ground.
- Avoid contact with open flames or hot surfaces, which could cause the decomposition into toxic and irritating products.
- In case of leak or spillage, contain with sand or other suitable absorbent material. Do not allow the refrigerant to flow into drains, sewers or basement, where vapour could form.
- > Follow the safety instructions and emergency procedures contained in this manual.
- > In case of absolute necessity, perform an emergency stop as instructed in this manual.



- > This product is intended exclusively for heating, cooling and domestic hot water production.
- Any use not specified in this manual is prohibited.
- This unit must be installed according to the applicable local regulations and standards.
- Make sure to wear protective personal equipement (respiratory protection, gloves, safety glasses, etc.) to carry out cleaning and maintenance tasks.
- Cleaning and user maintenance shall not be performed by children without supervision. Children shall not play close to or with the unit.
- Any modification to the unit and its components is strictly forbidden without the prior written consent of the manufacturer.
- If components need to be replaced, only genuine factory parts or components approved by the manufacturer must be used.



- When working on the unit and the system, make sure to use the appropriate tools to avoid damaging the pipes and components.
- Do not use the unit in excessively dusty, aggressive or explosive atmospheres, or in environments where there are heavy vibrations or electromagnetic fields.



- When unpacking the unit, check the integrity and condition of the packaging and that all the components and accessories described in the packing list are present. Contact your supplier in case of problem.
- When discarding the packaging, do not contaminate the environment. Dispose of it according to the applicable local regulations on recycling.

GENERAL AND SAFETY INFORMATION

Emergency Stop

The emergency stop allows the unit to be stopped in the shortest possible time.

If the need arises to activate this procedure, proceed as follows:

- > Turn the main switch (1) (yellow and red) to the OFF position; this immediately stops the unit by deactivating the power supply to the appliance.
- > Call your installer to troubleshoot the system and restart the unit.

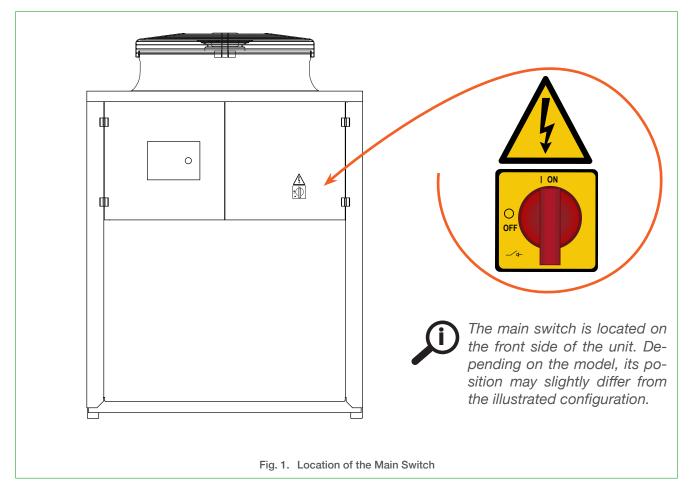
Restarting after an emergency stop



- This procedure can only be performed by qualified personnel.
- Before restarting and providing power supply to the unit, make sure that the reason/problem that initiated the emergency stop is found/corrected.

To reset the unit after an emergency stop, proceed as follows:

- > Turn the main switch (1) to the ON position; this action does not restart the unit but restores power supply to the unit.
- Perform start up procedure of the appliance, refer to "Start-up and Commissioning" on page G-41.



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Health and Safety

Danger	Location	Potential Injuries	Prevention	First Aid		
	Heat exchanger fins	Cutshand injuries	(-> Clean the wounds with dis-		
	Fan and fan grids	Cutshand/eye injuriesbroken bones	Do not put objects through the protection grids	infectant Dress the wounds In case of severe injuries, seek medical assistance		
	 Compressors Discharge pipes Low pressure safety valve (refrigerant circuit) 	 burns (contact with hot surface) frostbites (contact with refrigerant) poisoning (contact with skin or eyes, inhalation or ingestion) 	Check the pressure	In case of inhalation: Move the person away from the source of exposure, keep them warm and let them rest Administer oxygen if necessary Attempt artificial respiration if breathing has stopped or shows sings of stopping If the heart stops, perform		
	High pressure safety valve (refrigerant circuit)	 burns (heat/contact with refrigerant or hydraulic oil) poisoning (contact with skin or eyes, inhalation or ingestion) Loss of hearing 	Check the pressure	external heart massage Seek medical assistance In case of contact with the skin: Wash immediately with lukewarm water Thaw tissue using water Remove contaminated clothing Clothing may stick to the skin in case of frostbite If irritation, swelling or blisters appear, seek medical assistance In case of contact with the eyes: Rinse immediately using an eyewash or clean water, keeping eyelids open, for at least ten minutes Seek medical assistance In case of Ingestion Do not induce vomiting If the injured person is conscious, rinse their mouth with water and make them drink 200-300ml of water Seek immediate medical assistance Do not administer adrenaline or similar sympathomimetic drugs following exposure, due to the risk of cardiac arrhythmia		

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GENERAL AND SAFETY INFORMATION

Danger	Location	Potential Injuries	Prevention	First Aid
A STATE OF THE STA	 Electric cables and metallic parts Unit enclosure 	 electric shock burns (contact with hot metal/ fire) 	 Make sure the system has adequate electrical protection Check adequate insulation of all power cables Make sure all metallic parts are earthed 	> In case of severe injuries, seek medical assistance
	➤ Entire unit	 Burns due to fire poisoning (inhalation of fumes) 		 In case of burns: In case of light burns, pour cold water on the wounds and dress the wounds. In case of severe burns, seek medical assistance In case of inhalation: Move the person away from the source of exposure, keep them warm and let them rest Administer oxygen if necessary Attempt artificial respiration if breathing has stopped or shows sings of stopping If the heart stops, perform external heart massage Seek medical assistance

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Package Contents

- > An AURAX 2T heat pump
- > An Installation and Maintenance manual

Refer to "Unpacking the Unit" on page G-24 for the complete unpacking and installation instructions.

Unit Marking

The data plate is located on the right side of the unit.



PRODUCT DESCRIPTION

AURAX High Efficiency Heat Pumps

The Aurax 2T high efficiency heat pump series is a two pipe version that produces hot water for heating and cold water for cooling, but can also generate domestic hot water. The priority is always set to DHW over heating and is managed through dual set point definition in the controller.

These units have been specifically designed for use with radiant floor heating systems and provide maximum efficiency through their optimized heating mode. They are able to produce water up to 60°C and can operate down to an ambient temperature of -20°C.

The self-supporting steel frame is corrosion-resistant and allows easy access to the components thanks to its removable panels.

The units are equipped with tandem-mounted scroll-type compressors that efficiently use the refrigerant cycle when the source temperature is low. The compressors are protected by a crankcase heater and a thermal overload protection. They are installed in a separate enclosure, which allows maintenance while the unit is in operation.

The source heat exchanger is made of copper tubes and aluminium fins, whose design guarantees a low air-side pressure drop, meaning a low rotation speed, and less noise, of the fans. The latter are of the direct drive axial type and are equipped with a safety guard. They are statically and dynamically balanced and fixed to the frame with anti-vibration rubber mounts.

A "Super Silence" version is available as an option. It further reduces the noise level by approximately 10-12 dB(A) through the use of a special new floating frame that isolate the compressors from the casing through the use of a base plate and an acoustic enclosure. Both the compressors and the base plate are each mounted on their own damping systems.

The stainless-steel user plate-heat exchanger is combined with an R410A refrigerant circuit. Its construction reduces massively the refrigerant charge

The units are equipped with a reverse cycle valve that allows easy defrost in winter. The function is managed automatically by the microprocessor and also allows summer/winter change over.

The control also manages the anti-legionella program, the integration with other heating sources (electric heaters, boilers, solar panels etc), the op-

eration of a three port modulating valve (for diverting to DHW or heating) and both the heating circuit pump and the domestic hot water circuit pump.

This unit can be used for the production of Domestic Hot water, either through a solution that produces instantaneous hot water and includes an additional heat station and a buffer, or through the installation of a 3-way modulating valve in case of an existing DHW system. Please refer to "Typical Systems" on page G-30 for a detail of system layouts, or contact your AIC representative for more information.

The unit is comprised of the following safety devices:

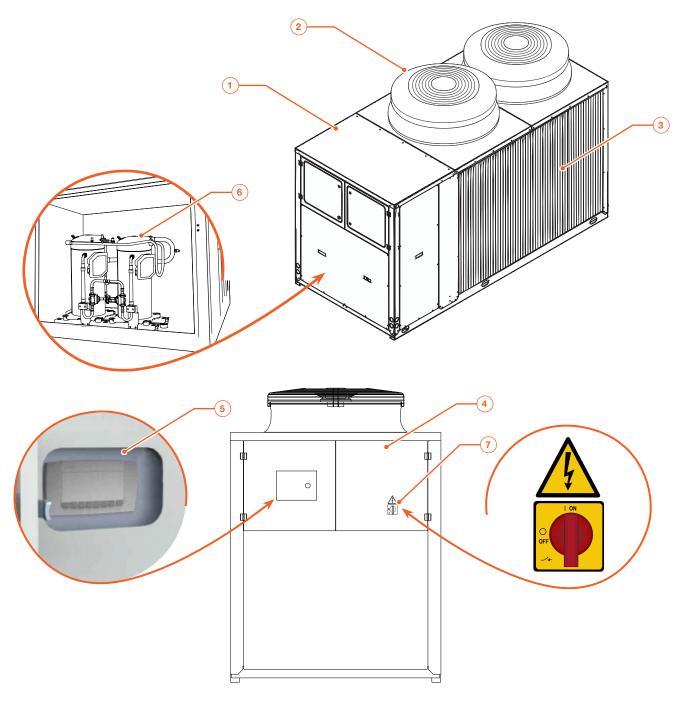
- > user water return temperature sensor
- antifreeze protection temperature sensor (users water output)
- > DHW supply and return temperature sensors,
- high pressure manual reset,
- > low pressure automatic reset,
- compressor thermal protection,
- > air fan, thermal protection,
- pressure transducer (used to optimize the defrost cycle and to adjust the fan speed depending on ambient conditions)
- temperature probe sensor with "Energy Saving" function
- user flow switch, to be installed (disables the operation of the unit in case of abnormal water flow in the system)
- A water strainer, to be installed.

It can also be fitted with $\ensuremath{\text{\bf optional}}$ accessories, such as :

- Condensate discharge drip tray with antifreeze heater (to be installed from factory)
- > Antifreeze kit
- Super Silence floating frame
- Rubber vibration dampers
- > Electronic soft starter
- > Remote control panel
- > Hydraulic circuit antifreeze kit
- > Integrated hydraulic kit 1 pump + Water tank
- > Integrated hydraulic kit 2 pumps + Water tank

Please contact your AIC representative for more information.

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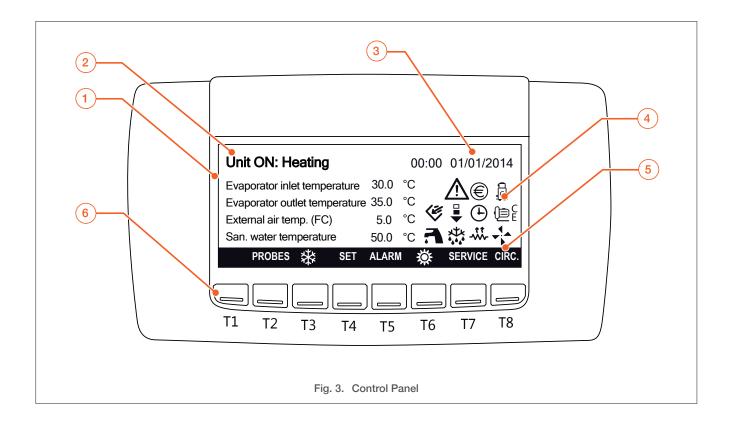
KEY

- 1. Hot-galvanised steel sheet enclosure
- 2. Direct drive axial fan with safety guard
- 3. Source heat exchanger with aluminium fins
- 4. Electrical box enclosure
- 5. Control panel
- 6. Tandem compressors
- 7. Emergency power switch

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PRODUCT DESCRIPTION

Control Panel and Main Functions



KEY

- LCD Display The display contains the operating information, parameters, symbols, messages and menus. For a detail of the symbols and menus displayed on the screen, see "Symbols and Functions on the Control Panel" on page G-13
- **2. Operation status** Indicates the current operating condition: On or Off, Heating or Cooling, etc.
- 3. Clock indicates the current date and time.
- **4. Symbol area** Zone of the screen where the system icons are displayed, indicating that a function or circuit is activated.
- **5.** Horizontal menu bar Indicates the available functions that can be activated through the keys underneath. Depending on the activated function, the contents of the menu bar change.

- **6. T1 to T8 function keys** to activate the functions displayed in the menu bar above.
- Messages and set points area Location where the set points and messages are displayed on the screen

The screen parameters such as brightness and contrast, language, etc. can be adjusted through the Service function and the icon.

See the opposite page and "Screen and Language Setup" on page G-22

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Symbols and Functions on the Control Panel

Icons in the Symbol area of the display (some of them will appear only if the function or circuit is enabled):



Compressor. Indicates that the compressors are in operation.

★ Water pump. Indicates that the pump is in operation.



Domestic Hot Water. Indicates that the Domestic Hot Water mode is activated.

Alarm. Indicates that an alarm is active and requires attention.

Economy mode. Indicates that the unit is operating in economy mode.

Unloading. Indicates that the unloading function is activated.

Electric Heater. Indicates that the electric heater is activated.

Timer. Indicates that the Economy mode or unit is ON/OFF according to the setting of the

Defrost. Indicates that the defrosting function is active.

Icons and functions appearing in the menu bar they are activated by pressing the key located under each of them:

Power function - To turn the unit off

Cooling - To enable the unit in cooling function.

Heating - To enable the unit in heating function.

PROBES Activate this function to read the value of the installed and configured sensors.

SET Activate this function to modify a param-

ALARM Activate this function to read and reset the alarms.

SERVICE Activate this function to access the service menu. See also the service-related icons opposite.

CIRC Activate this function to get the information on the circuits (compressors, water pump, sensors, etc.)

Activate this key to validate a value or se-ENTER lection.

EXIT Activate this key to go back to the main

RESET Activate this key to reset an alarm that is not active.

RSTALL Activate this key to reset all the alarms that are not active.

ENB/DIS To enable/disable functions (only for Service personnel).

A & **V** These keys allow to move up and down the list of menu items/ increase or decrease a value.

These keys allow to scroll through the screens.

Service symbols appearing on the Display:

Service menu (Service only). To access the service menu and set the parameters.

Time and date. To carry out time and date setting and read time band settings.

1 Compressors. To display the status of the compressors (working hours, number of activation).

Pumps. To display the status of the water pumps (working hours).

Œ Circuits. To display the status of the cir-

Alarms. To access the current alarms

Alarm log. To access the list of alarms (up to '99 are stored).

Defrost (if available). To read the status of defrost for each circuit.

Electrical Heater. To read the status of the electrical heaters.

Input/output. To read the probe status, analog/digital input and output.

Screw compressor (if available). To display the discharge temperature and liquid injection setpoint.

Auxiliary output. To read information about auxiliary output.

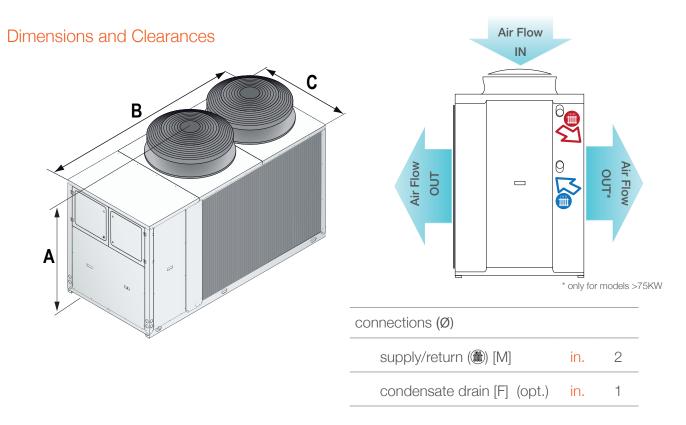
Domestic Hot Water. To read information about the DHW circuit control.

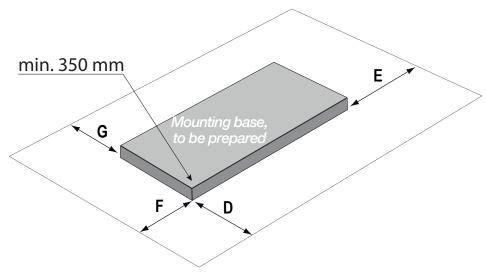
HOTKEY **Upload/Download** (service only)

> Control panel setup. To access contrast and backlight, language selection, system information, etc.

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TECHNICAL SPECIFICATIONS





AURAX

		22 - 29	37 - 47 - 51	61	67 - 75 - 93
А	mm	1 500	1 690	1880	1880
В	mm	1915	2400	2905	2905
С	mm	875	1145	1 145	1 145
D	mm	1000	1 500	1 500	2000
Е	mm	800	1 000	1 000	1 000
F	mm	800	1 000	1 000	1 000
G	mm	800	1 000	1 000	1 000

Performance and		AURAX									
Efficiency Data		22	29	37	47	51	61	67	75	93	
heating efficiency (EN14511)	kW	22,2	29,6	37,3	47,1	50,8	61,2	67,3	74,9	93,2	
total input power (EN14511)	kW	5,3	7,1	8,8	11,5	11,8	13,3	15,1	17,2	21,2	
COP (EN 14511)	W/W	4,11	4,16	4,23	4,11	4,32	4,61	4,46	4,36	4,40	
energy class		A++									
SCOP*	kWh/kWh	3,83	3,86	3,85	3,85	3,92	4,13	4,04	3,97	3,87	
ηs,h	%	150,1	151,4	150,9	151,1	153,6	162,0	158,4	155,8	151,7	
cooling capacity (EN 14511)	kW	18,1	25,4	30,5	40,6	44,2	52,4	57,5	65,4	80,5	
total input power (EN 14511)	kW	6,9	8,4	11,0	14,5	16,1	18,3	21,3	22,8	26,6	
EER (EN 14511)	W/W	2,62	3,02	2,78	2,81	2,7.4	2,87	2,70	2,87	3,03	

^{*} Average conditions, low temperature, variable - Reg EU 811/2013"

Operational and Cas Data		AURAX							
Operational and Gas Data	22	29	37	47	51	61	67	75	93
number of compressors/circuits					2/1				
number of fans					2				
refrigerant type	Diflu						6		
refrigerant charge kg	10,0	10,0	10,0	10,0	14,5	19,0	19,0	19,0	27,0
global warming potential (GWP)					20	88(
equivalent CO ₂ charge t	20,88	20,88	20,88	20,88	30,27	39,67	39,67	39,67	56,37
accumulation tank	100	100	100	100	100	300	300	300	300



The refrigerant data may change without notice. Always refer to the silver label placed on the unit

Sound Data*							AURAX*				
Sound Da	la		22	29	37	47	51	61	67	75	93
sound pressure level (Lp - i.a.w. ISO 3744)		dB (A)	41 / 32	42 / 33	42 / 35	43 / 37	44 / 40	44 / 40	45 / 40	46 / 41	50 / 42
sound power le	evel	dB (A)	73 / 64	74 / 65	74 / 67	75 / 69	76 / 72	76 / 72	77 / 72	78 / 73	82 / 74
(Lw - i.a.w. ISO 3744)	dB	86,9/ 77,9	87,9 / 78,9	87,9 / 80,9	88,9 / 82,9	89,9/ 85,9	89,9/ 85,9	90,9/ 85,9	91,9/ 86,9	95,9/ 87,9	
	63	dB	86,1 / 77,1	87,1 / 78,1	87,1 / 80,1	88,1 / 82,1	89,1 / 85,1	89,1 / 85,1	90,1 / 85,1	91,1 / 86,1	95,1 / 87,1
	125	dB	77,3 / 68,3	78,3 / 69,3	78,3 / 71,3	79,3 / 73,3	80,3/ 76,3	80,3/ 76,3	81,3/ 76,3	82,3 / 77,3	86,3 / 78,3
(HZ)	250	dB	71,2/ 62,2	72,2/ 63,2	72,2/ 65,2	73,2/ 67,2	74,2/ 70,2	74,2/ 70,2	75,2/ 70,2	76,2/ 71,2	80,2/ 72,2
Band	500	dB	69,7 / 60,7	70,7 / 61,7	70,7 / 63,7	71,7/ 65,7	72,7 / 68,7	72,7 / 68,7	73,7 / 68,7	74,7 / 69,7	78,7 / 70,7
	1K	dB	68,6 / 59,6	69,6 / 60,6	69,6 / 62,6	70,6 / 64,6	71,6/ 67,6	71,6/ 67,6	72,6 / 67,6	73,6 / 68,6	77,6 / 69,6
octave	2K	dB	63,2/ 54,2	64,2/ 55,2	64,2/ 57,2	65,2/ 59,2	66,2/ 62,2	66,2/ 62,2	67,2/ 62,2	68,2/ 63,2	72,2/ 64,2
	4K	dB	59,8 / 50,8	60,8 / 51,8	60,8/ 53,8	61,8/ 55,8	62,8 / 58,8	62,8/ 58,8	63,8 / 58,8	6.4,8 / 59,8	68,8 / 60,8
	8K	dB	50,7 / 41,7	51,7 / 42,7	51,7 / 44,7	52,7 / 46,7	53,7 / 49,7	53,7 / 49,7	5.4,7 / 49,7	55,7 / 50,7	59,7 / 51,7

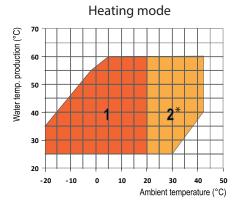
^{*} Values in bold are for models provided with the Super Silence option

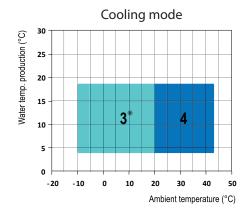
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Floatiscal Data		AURAX									
Electrical Data	22	29	37	47	51	61	67	75	93		
supply voltage/phase/free	. V/~/Hz	400 / 3	s+N / 50			۷	400 / 3 / 50				
control board	V					24					
auxiliary circuit	V/~/Hz		230 / 1 / 50								
fan power supply	V/~/Hz	230 / 1 / 50 400 / 3 / 50									
line section	mm ²	10	16	16	16	25	25	35	35	50	
PE section	mm²	6	10	10	10	16	16	25	25	25	
heating cable - condensate	pipe (opt.)										
Protection	IP					67					
heating capacity	W					35					

Hyd	draulic Data & Op	ng .					AUR	AX				
	nditions '		J	22	29	37	47	51	61	67	75	93
min.	DHW water content	I		240	340	400	480	560	650	750	820	1 000
accu	mulation tank			100	100	100	100	100	300	300	300	300
	min. water content. (heating mode)	1		240	340	400	480	560	650	750	820	1 000
hot water temp.		°C	Min.					30				
			Max.	60								
user circuit	Cold water temp	°C	Min.	4								
Iser	(RV models only)	30	Max.	18								
_		Nor	minal					@ ΔT :	5°C			
	Water flow rate (@temp diff.)	N	lin.					@ ΔT 8	в°С			
	(@tomp aiii.)	M	ax.					@ ΔT :	3°C			
outd	oor temperature - heat-		Min.					-20)			
	node	°C	Max.					43				
outd	oor temperature -	0.0	Min.					-10)			
	ng mode	°C	Max.	x. 43								
com	pressor capacity steps	1/2						50%/	50%			

Limits of Operation





*2 & 3 : modes with head pressure control (DCCF)

Correction factors

Corrections for Operation with Glycol

Glycol percentage	Freezing point (°C)	Capacity Correction Factor (CCF)	Input Power Correction Factor (IPCF)	Water Flow Correction Factor (WFCF)	Pressure Drop Correction Factor (PDCF)
10%	-3,2	0,985	1	1,02	1,08
20%	-7,8	0,98	0,99	1,05	1,12
30%	-14,1	0,97	0,98	1,09	1,22
40%	-22,3	0,965	0,97	1,14	1,25
50%	-33,8	0,955	0,965	1,2	1,33



The water flow rate and pressure drop correction factors must be applied directly to the values given for operation without glycol:

- The water flow rate correction factor is calculated in order to maintain the same temperature difference as that which would be obtained without glycol.
- The pressure drop correction factor takes into account the different flow rate obtained from the application of the flow rate correction factor.

Corrections for different ΔT and different Fouling factors

Water temperature difference (°C)	3	5	8
Cooling Capacity Correction Factor (CCCP)	0,99	1,00	1,02
Input Power Correction Factor (IPCF)	0,99	1,00	1,01

Fouling factor	0,00005	0,0001	0,0002
Cooling Capacity Correction Factor (CCCP)	1,00	0,98	0,94
Input Power Correction Factor (IPCF)	1,00	0,98	0,95

Water Quality Requirements

PH6-8	Total Hardness< 50 ppm
Electric conductibility< 200 mV / cm (25°C)	Sulphur ionNone
Chlorine ions< 50 ppm	Ammonia ionNone
Sulphuric acid ions< 50 ppm	Silicon ion< 30 ppm
Total Iron < 0.3 ppm	

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Safety Instructions for the User



- This appliance can be used by children who are at least 8 years old and by persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, provided that they are under supervision or have been given instructions concerning the use of the appliance in a safe way and that they understand the hazards involved.
- Cleaning and user maintenance shall not be performed by children without supervision. Children shall not play with the appliance.
- Do not modify or deactivate any component, nor any safety device in the system.
- Do not install and use the unit in environments:
 - very dusty or with a potentially explosive atmosphere;
 - where vibrations are present;
 - presenting electromagnetic fields;
 - with aggressive atmospheres
- The unit contains potentially toxic and hazardous materials. Always wear personal equipment to protect the body and face.
- Follow all safety instructions and emergency procedures contained in this manual

Disposal of the Product at the End of Service Life



At the end of service life, the product should not be disposed of as solid urban waste, but should be handed over to a differentiated waste collection centre.



- Do not modify any part of the electrical system or access internal components.
- Do not touch the appliance with any wet body parts when the appliance is supplied with electrical power.



- Do not open any sealed part or component. Failure to comply with this instruction can result in damages and/or injuries.
- Make sure that the unit and the heating system are prevented from freezing.
- In case of leakage, disconnect the unit from the power supply and gas source, turn off the water supply and call a qualified professional.
- In case of abnormal noises in the system or the unit, please notify a qualified professional.
- Any setting of the unit by the end-user using the Service-specific functions, could cause the appliance to malfunction and result in damages to the equipment. Only the end-user settings described in this manual are available to the end-user.
- Check regularly that the water pressure of the system is at least 1 bar when cold. If not, top up the system with water as instructed by the installer at installation or call your installer.
- If a topping up of the system is required to maintain the minimum recommended water pressure, always turn the unit off and only add small quantities of water at a time. I to prevent damaging permanently the unit.
- If the system needs to be topped up regularly, there may be a leak in the system. In that case, call your installer.
- Check regularly that there is no error code displayed on the control panel screen. Call your installer as required.

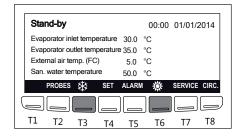
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Operating the Controller - End User Level



For the meaning of the icons and functions displayed on the screen, refer to "Symbols and Functions on the Control Panel" on page G-13.

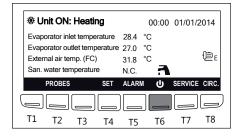
Turning On and Off



Depress:

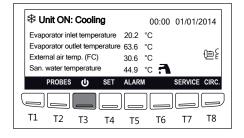
T6 (※) to turn on in Heating mode

T3 (※) to turn on in Cooling mode

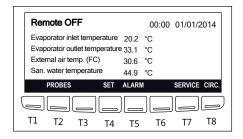


Depress:

T6 () to turn off in Heating mode



T3 () to turn off in Cooling mode



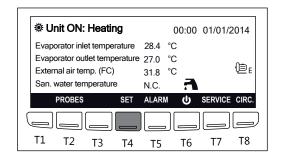
Through the **remote control** (if installed - refer to "Electrical connections" on page G-36), the unit can be turned on and off. If installed, it has priority over manual activation/deactivation.

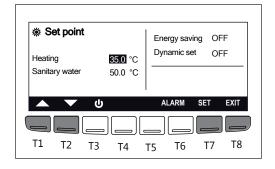


In this manual, screens displaying the Heating function are shown as examples. Depending on the active function (Heating or Cooling), and of the sensors and components installed in the system, the contents of the screens may differ. The principle of operation and navigation through the screens is however identical.

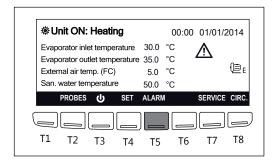
INSTRUCTIONS FOR THE USER

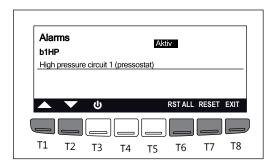
Definition of Setpoints - SET Function





Resetting an Alarm - ALARM Function





Depress:

T4 (SET) to access Set point definition screen

Depress:

T1 () / T2 () to navigate through the set points.

77 (SET) to select the value (starts blinking).

T1 () / T2 () to increase/decrease the value.

77 (SET) to confirm the value.

78 (EXIT) to exit the screen and return to the home screen

Refer to "Setpoints" on page G-46 for the temperature ranges and default values.

If \triangle is blinking on the screen, an alarm has occurred

Depress:

75 (ALARM) to display the alarm status:

- Active : cannot be reset because it is still active
- Password : no access for the end-user. Please contact your installer/AIC representative
- ▶ Reset : alarm is not active and can be removed as follows :
 - T1 ()/T2 () to select the alarm to be deleted
 - 77 (RESET) to delete one alarm at a time
 - **76** (RSTALL) to delete all the resettable alarms

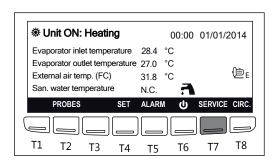
78 (EXIT) to exit the screen and return to the home screen



If an alarm buzzer is sounding, it can be stopped by pressing and releasing any of the keys.

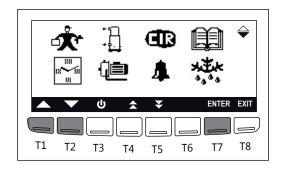
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Setting the Time and Date



Depress:

77 (SERVICE) to access the Service screen



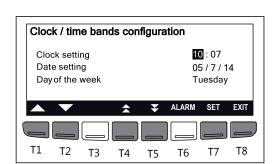
Depress:

T1 () / T2 () to select the icon.

77 (ENTER) to confirm and access the **Date and** Time screen



When an icon is selected, it is displayed on a black background.



Depress:

T1 () / T2 () to scroll through the lines.

77 (SET) to select the value. It starts blinking.

T1 () / T2 () to increase/decrease the value.

77 (SET) to confirm the value.

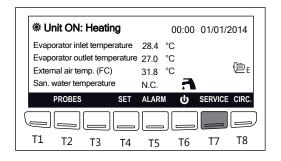
T4 (♠)/T5 (♥) to read the info about the Energy saving, ON/OFF scheduling and time bands on other screens (cannot be modified by the end user).

78 (**EXIT**) to exit the menu

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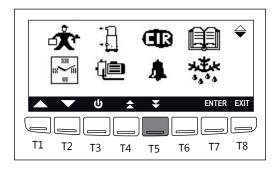
INSTRUCTIONS FOR THE USER

Screen and Language Setup



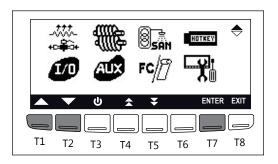
Depress:

77 (SERVICE) to access the Service screen



Depress:

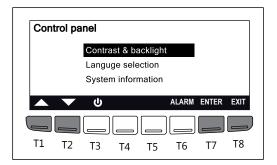
T5 (▼) to access the second screen of icons



Depress:

T1 (A) / T2 (V) to select the icon.

77 (ENTER) to confirm and access the Control panel screen



<u>Depress</u>:

T1 () / T2 () to scroll through the lines.

77 (ENTER) to select the line and perform the required adjustments:

- > Contrast and backlight
- Language selection

or read information:

System information

78 (EXIT) to exit the menu and go back to the home screen.

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Safety Instructions for the Installation



- All connections must be carried out in accordance with current standards and regulations in force.
- Choose an installation site in accordance with standards EN 378-1 and 378-3 and take into consideration risks caused by accidental refrigerant leakage.
- Do not install and use the unit in environments:
 - very dusty or with a potentially explosive atmosphere;
 - where vibrations are present;
 - presenting electromagnetic fields;
 - with aggressive atmospheres
- Do not install the appliance in a location where chemical vapours or dust are present in the ambient air.
- Make sure to install all required external components to ensure the correct operation of the system.
- Before the installation, make a complete check of the unit for possible refrigerant leakages due to bad transport conditions.



- When the unit is connected to the electrical network, it must be earthed.
- Make sure that a fuse or circuit breaker of the recommended rating is installed outside the unit, so as to be able to shut the power down.
- Do not touch the unit with any wet body parts when it is supplied with electrical power.
- Before performing any operation on the electrical circuit, isolate the electrical supply of the appliance through the external power-cutting device (fuse, circuit breaker, etc.)



- > The unit is designed for outdoors installation.
- Do not install the unit in the vicinity of trees or under an overhang.
- > Comply with the clearance dimensions provided in this manual.
- It is essential to ensure adequate air volume to the source fan. Avoid recirculation of discharge air; failure to observe this point will result in poor performance or activation of safety controls
- In defrost mode, the heat exchanger will produce condensates, which can create a thick layer of ice if the ambient temperature is below 0°C. It is therefore recommended to raise the unit by a minimum height of 350 mm to prevent damage to the heat exchanger due to ice formation.
- Install the unit in such a way as to prevent a slipping hazard to the user or third parties due to the presence of ice around the heat pump.
- Make sure to protect the unit and the circuits against freezing.
- In Winter mode, the unit can be started with external air of -20°C and cold inlet water (about 20°C), but only for a short time, to bring the system to the right temperature. The installation of a 3-way valve is recommended to bypass water from the user to the plant.
- If the area of installation is particularly windy (wind speed in excess of 2,5m/s), provide some windbreaker barriers.
- In their standard configuration, the units are not suitable for installation in saline environments.
- The unit must be installed to ensure easy access at all times.
- Use an appropriate means of handling, suitable to the unit size and weight.
- Install all pipes and ducts without stress to prevent any leaks from occurring.

PRODUCT INSTALLATION

Handling the Unit



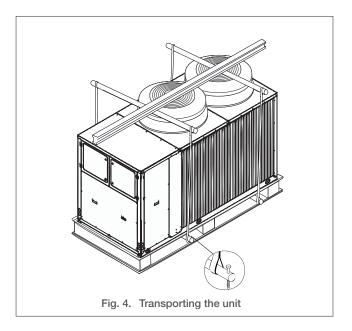
- This unit is very heavy and requires adequate means of handling and transport. Make sure to comply with applicable local standards and regulations on product handling.
- Units can be lifted with a forklift or, alternatively, belts, making sure not to damage the side panels or covers.
- During the handling process, keep the unit horizontal at all time to avoid damage to the internal component.
- Also avoid sudden movements in order to protect the refrigerant circuit and other components.
- Failure to comply with these recommendations can result in damage to the unit or injuries to the personnel

Safety requirements:





Using an appropriate lifting means, move the unit in its packaging close to the installation location.



Unpacking the Unit

Safety requirements:





The unit is packaged with different materials such as wood, cardboard, nylon, etc.

- 1. Carefully remove the packaging and protections.
- 2. Discard packaging according to applicable local regulations.

Installing and Preparing the Unit

Safety requirements:







Heat exchanger fins



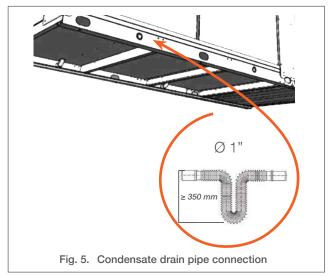
Make sure to comply with the recommended clearances for the unit installation, refer to "Dimensions and Clearances" on page G-14.

Make sure to comply with all the safety instructions for the installation, as defined on the previous page.

1. If the unit was equipped with a condensate drip tray (option) from factory, install a condensate drain line connected to the sewer to one of the four connection points.

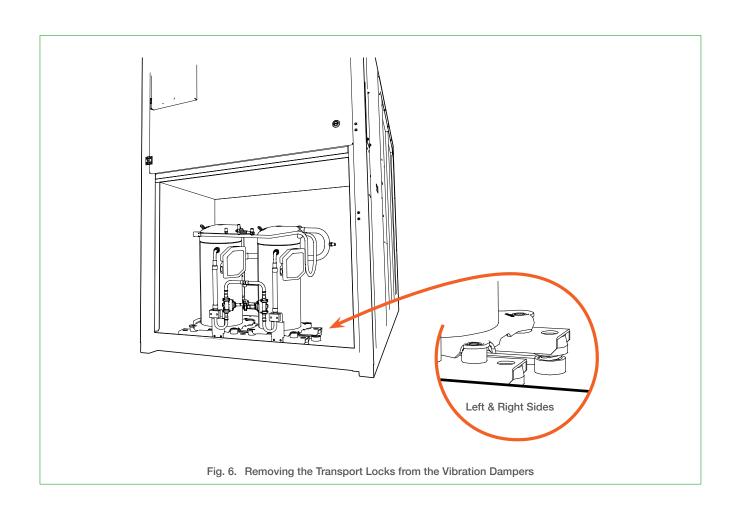


Provide a heating cable in the discharge pipe to prevent condensate water from freezing in the pipe, which could prevent the correct operation of the unit. Refer to "Electrical Data" on page G-16 for the heating cable characteristics.



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- 2. Release the vibration dampers under the compressors:
 - Open left and right side access doors, refer to "Opening and Closing the Access Doors" on page G-26.
 - Using a hex socket head wrench, remove the yellow locking devices installed for transport on the vibration dampers (if present).
- 3. Open the (top) front door(s) to access the electrical components and check that all electrical connections on fuses and relays terminals are secure.
- 4. On RMT, check the correct order of cable connections and that they are secure.



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Opening and Closing the Access Doors

Conditions:





Tools and Material:

- Screwdriver, crosshead
- Screwdriver, large flat head

Removal Procedure:



Depending on the model, the configuration of the front panels can be slightly different, with one, two or three access doors.

Top Front door(s) and Controller Door



To be able to open the top door, make sure that the emergency power switch is set to OFF.

- 1. Using a large flat-head screwdriver, rotate the locking screws (1) to release the catch at the back.
- 2. Open the door on its hinges.

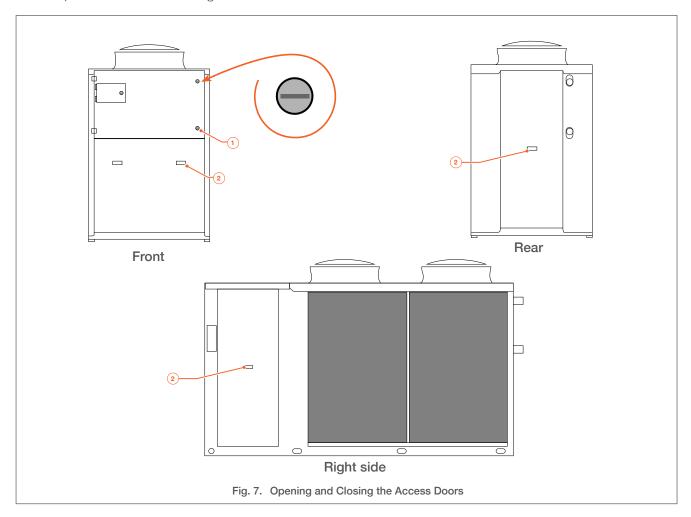
3. Perform procedure in reverse order to close the door(s).

Bottom Front Access Door

- 1. Using a crosshead screwdriver, remove the screws around the access door. Retain for reinstallation.
- 2. Lift the access door using the built-in holders (2) and set aside.
- 3. Perform procedure in reverse order to close the door(s).

Side and Rear Access Doors

- 1. Using a cross-head screwdriver, remove the screws around the access door. Retain for reinstallation.
- 2. Lift the access door using the built-in holder (2) and set aside.
- 3. Perform procedure in reverse order to close the door(s).



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Safety Instructions for the Hydraulic Connections

Primary Circuit



Make sure that the circuit is provided with a safety pressure relief valve and an expansion vessel that is appropriate for the the system size and unit power, and the increase in temperature and pressure.



- No isolating valve may be installed between the appliance and the safety valve. The safety valve drainage must be connected into a pipe with a diameter no less than that of the valve itself.
- The pressure of the water network used to fill the appliance must be at least 0,8 bar.
- If the supply pressure from the network is higher than 6 bar, make sure to install a pressure reducing valve set at 4,5 bar.
- Verify the water quality of the network according to the requirements defined in this manual.
- In case inhibitors are used in the system, consult the manufacturer for product suitability.
- Any antifreeze used in the primary circuit must comply with Public Hygiene Regulations and must be non-toxic. A food-grade Propylene Glycol is recommended. It must be diluted according to the ratio recommended in the local regulations, but with a maximum ratio of 30%.
- Consult the unit manufacturer to determine the compatibility of the antifreeze product with the appliance materials.



- It is recommended to install the following devices in the system to prevent water contamination:
- Water filter and/or dirt separator installed on the return circuit. Have the water circulate for 2 hours after installation and prior to appliance start up in order to clean the circuit of contaminants. Clean the filter after filling the system.
- Plate heat exchanger, combined with a micro-pollutant separator, which will protect the appliance from any contaminants present in an old heating system, where fittings and pipes can be corroded. This is also mandatory for open systems where oxygen can penetrate the system and cause corrosion.



- The use of antifreeze in the primary circuit will lead to a reduction in the heating performance. The higher the concentration of antifreeze in the circuit, the lower the performance. Maximum output must be adjusted accordingly.
- The circuit diagrams are theoretical representations that do not necessarily include all the required safety devices. Make sure to correctly plan your system according to the applicable local regulations and standard practices.

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PRODUCT INSTALLATION

Domestic Hot Water Circuit



- Make sure that the circuit is provided with a safety group. It must be composed of a safety valve set at 7 bar, a check valve and a stop valve.
- The hot water produced in the circuit can reach temperatures higher than 60°C and cause scalding when drawn from a tap. The installation of a thermostatic mixing valve is therefore recommended.



- The pressure of the water network used to fill the appliance must be at least 0,8 bar.
- The supply pressure from the network must be comprised between 0,8 and 6 bar. If the pressure is higher than 6 bar, a pressure reducing valve set at 4,5 bar must be installed.
- Flush thoroughly the circuit before operation.



- The installation of an expansion vessel in the DHW circuit is recommended to prevent the water hammer effect in the pipework and the frequent opening of the safety valve.
- > To prevent the development of the bacteria Legionella Pneumophilia in the DHW circuit, it is recommended to either activate the antilegionella function of the unit (if any) or to increase regularly the DHW circuit temperature to 70° for a short period.
- The circuit diagrams are theoretical representations that do not necessarily include all the required safety devices. Make sure to correctly plan your system according to the applicable local regulations and standard practice.

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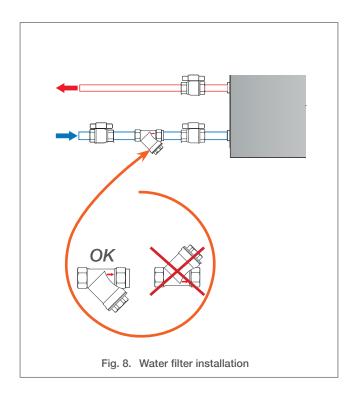
Requirements for the Hydraulic Connections



- Install the water pipes in accordance with national and local regulation.
- Pipes can be made from copper, steel, galvanized steel or PVC.
- Design the pipe work to cater for the nominal water flow and the hydraulic pressure drops of the system, (maximum pressure drop of 300 Pa/m is typical).
- Insulate all pipes with closed-cell material of adequate thickness
- Make sure to fit the system return water to the connection labelled: "USER WATER IN". An incorrect connection can damage the heat exchanger by freezing.
- The USER WATER IN connection must be fitted with a water strainer whose mesh is not larger than 1mm. Failure to comply will invalidate the warranty.
- Make sure to check the filter regularly and keep it clean.
- In standard configuration, a flow switch, provided with the unit, must be fitted to the connection labelled "USER WATER OUT". Failure to comply will invalidate the warranty.
- Do not allow the water flow through the heat exchangers of the unit to fall below flt 8°C. Measurement conditions:
 - Heating mode: 7°C Dry bulb ambient temperature, 35°C water outlet temperature;
 - Cooling mode: 35°C dry bulb ambient temperature, 7°C water outlet temperature

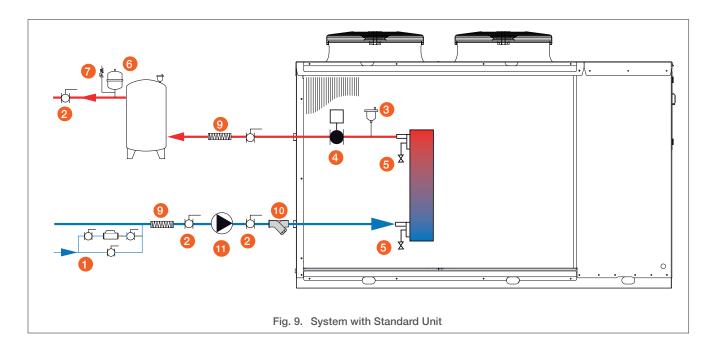
The hydraulic piping should includes:

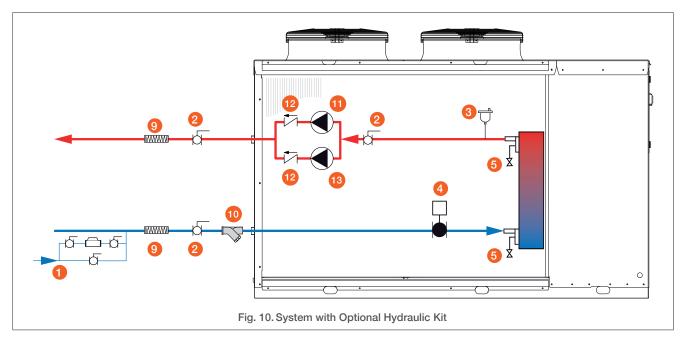
- Pockets for temperature sensor to measure the temperature in the system
- Flexible joints, to isolate the unit from the rest of the system
- Temperature and pressure gauges for maintenance and servicing operations
- Shut-off manual valves to isolate the unit from the hydraulic circuit
- Vent valves, expansion tank with water filling, discharge valve
- Metallic filters to be mounted on the inlet pipe with a mesh not larger than 1 mm (supplied as standard)
- > See the following pages for examples of standard systems and DHW-production ones.



PRODUCT INSTALLATION

Typical Systems





KEY

- 1. System filling group
- 2. Shut-off valve
- 3. Venting valve
- 4. Flow switch
- 5. Drainage valve6. Expansion vessel
- 7. Safety valve
- 8. User water tank

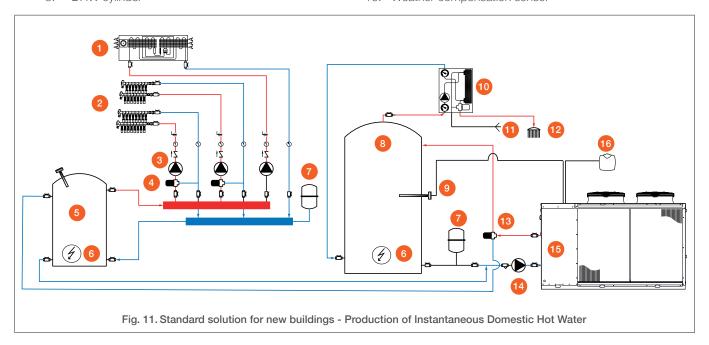
- 9. Flexible connection
- 10. Water strainer
- 11. Water pump
- 12. One way valve
- 13. Water Pump

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System for the Production of Instantaneous Domestic Hot Water

- 1. Dehumidifier / Cooling
- 2. Underfloor heating system
- 3. Secondary circuit user water pumps
- 4. Underfloor heating modulating valves
- 5. Buffer storage tank
- 6. Integrated electric heater
- 7. Expansion vessel
- 8. DHW cylinder

- Domestic hot water sensor
- 10. Instantaneous DHW producer
- 11. Domestic cold water
- 12. DHW supply
- 13. 3 way ON/OFF valve Heating/DHW production
- 14. Primary circuit user water pump
- 15. Heat pump
- 16. Weather compensation sensor





- The DHW heat exchanger must be connected to a storage tank in a closed circuit. Please contact your AIC representative for the correct sizing.
- All the components shown in the above diagram are required to connect the DHW tank.
- The tank is equipped with a heat exchanger (copper coil or plate heat exchanger, depending on the version).
- The heat pump has to be connected to the volume of the storage cylinder This is required to guarantee the correct operation of the unit, avoiding frequent start and stops of the compressors.

- > The DHW water inlet and outlet are connected to the heat exchanger to ensure direct heat exchange between the "technical" water stored in the tank and the domestic hot water flowing inside the heat exchanger.
- The temperature of the supplied domestic hot water should be controlled through a thermostatic valve.

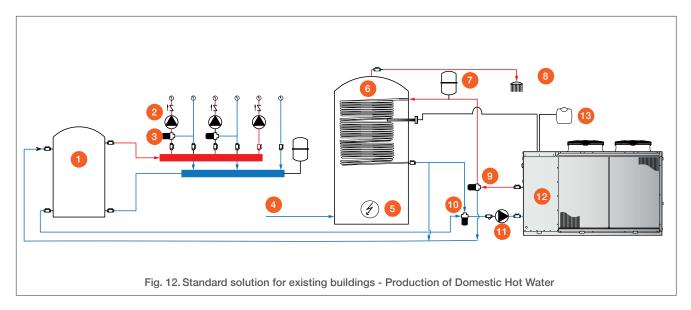
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PRODUCT INSTALLATION

System for the Production of Domestic Hot Water through Accumulation

- 1. Buffer storage tank
- 2. Secondary circuit user water pumps
- 3. Underfloor heating modulating valves
- 4. Domestic cold water
- 5. Integrated electric heater
- 6. DHW cylinder (with coil)
- 7. Expansion vessel

- 8. DHW supply
- 9. 3 way ON/OFF valve Heating/DHW production
- 10. 3-way mixing valve
- 11. Primary circuit user water pump
- 12. Heat pump
- 13. Weather compensation sensor



This is a solution for existing building/systems where it is not possible to remove the existing plant. Therefore, the solution might not be optimised and only offers the advantage to use the existing DHW tank.

Therefore, the heat exchanger inside the DHW tank might be of a wrong size, causing the frequent start and stop of the heat pump and possible frequent high pressure alarms as well as cold water in the tank.

In this case, the best solution is to install a 3-way modulating valve Depending on the return water temperature measured by the sensor, the 3-way valve modulates the opening of the by-pass port. This allows to optimise the use of the existing heat exchanger capacity The unit microprocessor controls the 3-way valve operation.



- Make sure to install a 3-way modulating valve to ensure the correct operation of the system
- The 3 way valve MUST have a maximum opening time period of 35 seconds Longer opening time periods can create malfunctions in the system with possible high pressure alarm(s) in the heat pump.

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Safety Instructions for the Electrical Connections



Electrical connections must be carried out by a qualified professional in accordance with current standards and regulations in force.



- When the unit is connected to the electrical network, it must be earthed.
- Make sure that a fuse or circuit breaker of the recommended rating is installed outside the unit, to allow electrical isolation.
- Do not touch the unit with any wet body parts when it is supplied with electrical power.

- Before performing any operation on the electrical circuit, isolate the electrical supply of the unit through the external power-cutting device (fuse, circuit-breaker, etc.)
- When routing the cables through sharp-edged holes in the panels, make sure to install glands or grommets, and to secure the cables in order to prevent any damage.

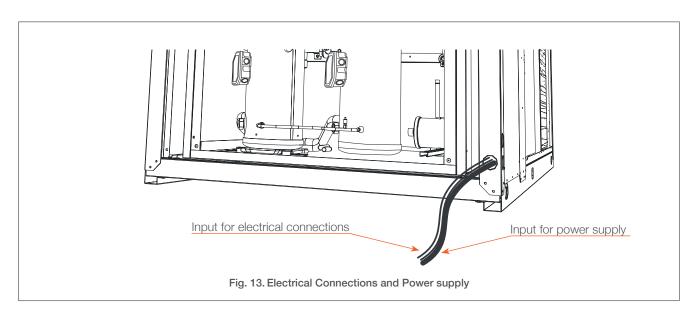


When connecting wires to the terminals, check that the connection is secure and that all the cable strands are tightly held.

Power supply connection

Power supply cables are connected to the unit through the front. See Fig. 13

Refer to "Electrical Data" on page G-16 for the correct sizing of cables.



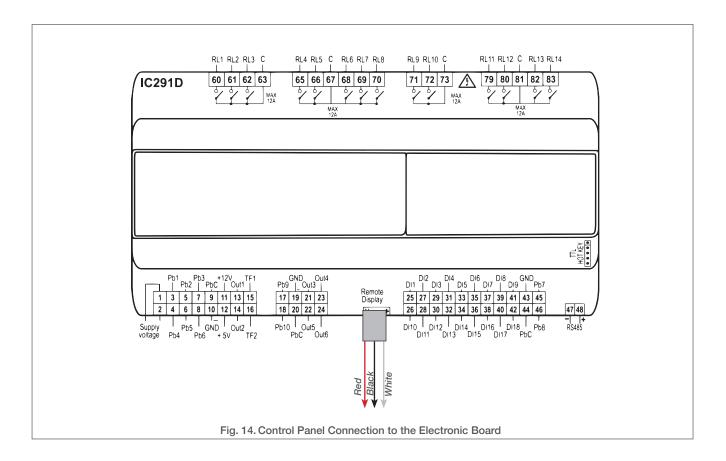
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PRODUCT INSTALLATION

Installing a Remote Control Panel



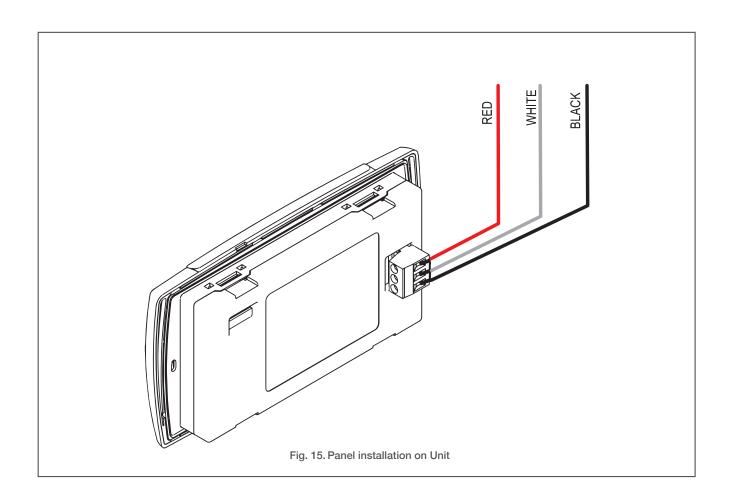
- Special care must be taken when connecting the keyboard to the controller, in order to avoid irreparable damage to the PCB and/or control panel.
- In case of power supply failure (black or red wire), the control panel will not work.
- > In case of communication problems, the display will show "noL" message.

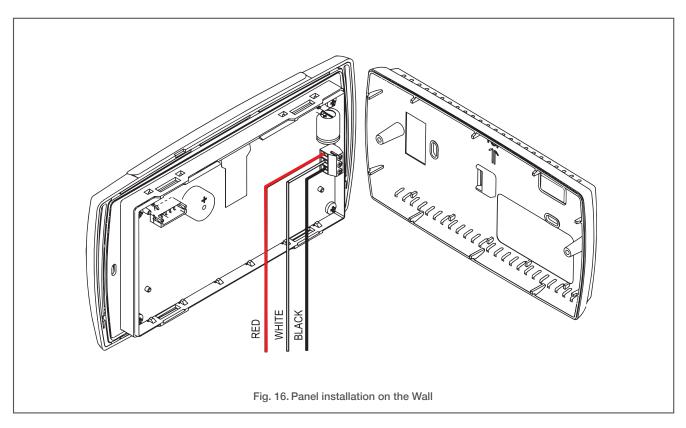




The complete wiring diagram is provided with the unit.

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PRODUCT INSTALLATION

Electrical connections



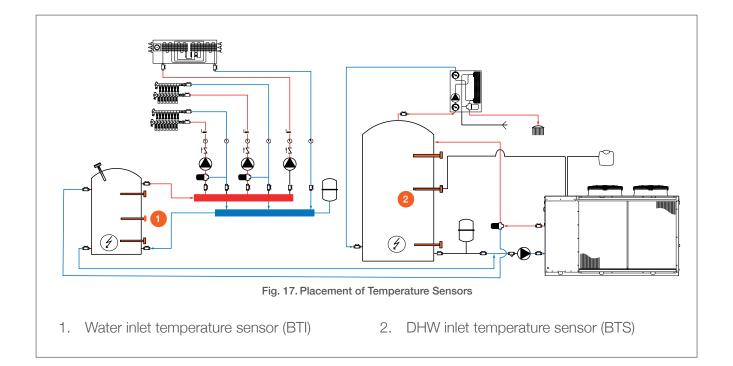
- The terminals mentioned below are to be found in the electrical box and connections shall be performed by qualified personnel on site.
- The numbering of the terminals may change without notice. Refer to the wiring diagram provided with the unit for more information.

Terminals	Components	Description
Remote wiring connections (To be connected on the electrical box - by the installer on site)		
-3 X. U	Water inlet temp. sensor - user circuit	Install on the return circuit. In standard operation, the user pump is off during stand-by periods, so the sensor must be placed in a position that ensures the correct operation of the heat pump.
		Provided with 3m of cable, placed loose in the electric box but not connected. If additional length is required, use 0,5 mm ² cable. max length: 50 m.
U7 & N7	Water pump - user circuit	The water pump is switched off by microprocessor when setpoint is reached or in stand-by periods, which reduces the electrical consumption. If the pump is supplied from factory, it is connected to U7 and N7 (max. input current 3A)
17 & 20	Domestic Hot Water temp. sensor	Install in correct position in a pocket in DHW cylinder. It will measure the return temp. and ensure the correct operation of the heat pump.
		Provided with 3m of cable, placed loose in the electric box but not connected. If additional length is required, use 0,5 mm ² cable. max length: 50 m.
U8 & N8	DHW circuit pump	Connect to U8 and N8 (max. input current 1A). The water pump is switched off by microprocessor when setpoint is reached or in stand-by periods, which reduces the electrical consumption.
Remote wiring connections (optional accessories - please contact your AIC representative)		
190, 191 & 192	3-Way ON/OFF valve	For the DHW circuit - activated by the DHW sensor (BTS) to divert the hot water either to the cylinder or to the user circuit.
1 & 2	Remote ON/OFF	Used to switch the unit on or off remotely. Replace the cable jumper connected across terminals with a switch. Contact closed = unit ON Contact open = unit OFF
43 & 26	Remote Summer/Winter change over	Used to switch the unit remotely from heating to cooling. Replace the cable jumper connected across terminals with a switch.
		Contact closed = Winter mode Contact open = Summer mode

Terminals	Components	Description
90, 91 & 92	Remote general alarm	For remote display of a general alarm, connect the visual or sound device between terminals 90-91-92. Contacts 90/91 NC (Normally closed) Contacts 91/92 NO (Normally opened)
68 & 2N1	Electric integration heaters - user circuit	If user circuit integration heaters are required, the coil of the contactor that is used to switch them must be connected across terminals 78 and 2N1
83 & 2N1	Electric integration heaters - DHW circuit	If domestic hot water circuit integration heaters are required, the coil of the contactor that is used to switch them must be connected across terminals 93 and 2N1
40 & 43 (+ 50 & 57)	Priority selector	If a priority selector switch is to be fitted, a voltage free switch has to be connected to terminals 50 and 57. The unit is supplied with nothing connected to terminals 50 and 57 (Open contact) Closed contact: Domestic hot water only; Open contact: Domestic hot water / Heating (and /or cooling);
6L3 & 6N4 + 6L1 & 6N1 (models with neutral) 6L3 & 6L4	9	Prevents freezing of the condensate in the drain pipe. Max current ≤ 0,5 A for a max power of 100 W. It is operated in conjunction with the electric heater in the condensate drain tray (opt.)
Factory-fitted wi	ring connections	
20 & 18	Weather compensated sensor (BTE)	Used to measure the ambient temperature enabling weather compensation modulation of the user set point with respect to the ambient conditions.
43 & 35	Flow switch - user circuit (SFW1)	This is used to protect the unit if there is a low water flow rate in the user circuit.

PRODUCT INSTALLATION

Placement of Water Inlet Temperature Sensor (BTI) and DHW Inlet Temperature Sensor (BTS)





- To guarantee the correct measurement of the temperature, insert the probe in the sensor pocket of the buffer tank.
- > The illustration above indicates the locations where the sensors can be installed. Do not install anywhere else in the system. Failure to comply can result in malfunction of the unit and the system.

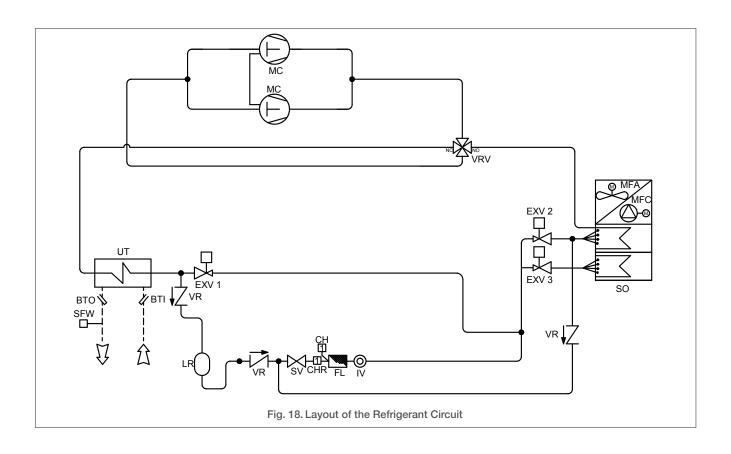
Refrigerant Circuit Layout

In addition to producing hot water for heating and cold water for cooling, this unit also generate domestic hot water

The controller has dual heating setpoints (heating and DHW) and can also control a 3-port diverting valve that directs the DHW to the cylinder.

DHW production has priority irrespective of the mode of operation of the unit

The unit is normally used with two pipe water based change-over systems.



BTI	User water input probe	MFC	Centrifugal fan
BTO	User water output probe	SFW	User flow switch
CH	Charging plug	SO	Source side
CHR	Charging plug	SV	Shut off valve
ECO	Economizer	UT	User side
EXV	Thermostatic valve	VR	Check valve
FL	Liquid line filter	VRV	Reverse cycle valve
IV	Moisture indicator sight glass	YEC	By-pass solenoid valve
LR	Liquid receiver		Refrigeration connections
MC	Compressor		Hydraulic connections
MFA	Source fan		

Safety Instructions Before Start-up



Check that all connections (electrical, hydraulic) have been carried out and that they are tight and secure.



- Before starting the unit, check that the hydraulic circuit(s) is/are full of water and that the unit is supplied with electrical power.
- Check that there is no refrigerant leakage and that all taps are open.
- Check that there are no oil stains, sign of a possible leak.
- Check that the water pressure is sufficient in the user water circuit (at least 1 bar when cold). Top up the circuit as required.
- If frequent top-ups are necessary, check for leaks and repair as required.
- Once the filling of the heating circuit is complete, close the filling valve.



Once the initial start-up process is complete, fill in the installation checklist with all the relevant information on the system for future reference. Refer to "Installation Checklist" on page G-60

Filling the Hydraulic Circuit

Conditions:





Procedure:

- 1. Check that the system drain valve is closed.
- 2. Open all pipework, heat pump and terminal unit air vents
- 3. Open the shut off valves
- 4. Slowly open the water valve in the filling group outside the unit.
- 5. 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 bars (pressure should be between 1 and 2 bars).

Follow-on Task(s):

None

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Start-up and Commissioning

Conditions:





All initial checks have been carried out. Refer to "Installing and Preparing the Unit" on page G-24

Safety requirements:

















Procedure:

- 1. Check that all refrigerant taps are open in the unit before starting up.
- 2. Energise the unit through the dedicated fuse(s) on the electric box.
- 3. Make sure that the Emergency switch is set to ON.



Never switch the unit on and off using the emergency switch: this should only be used in case of emergency, to disconnect the unit from the power supply when the unit is to be permanently off. Isolation will result in no supply for the crankcase heater and the compressor could be seriously damaged at start-up.

- 4. Press the key corresponding to the Heating (**) or Cooling (**) mode located on the control panel. The corresponding icon will appear on the screen. Refer to "Operation Modes" on page G-46 for more information on the available modes.
- 5. Perform the setup of the system as required. Refer to "Setpoints" on page G-46
- 6. Check the operation of the compressors and fans by measuring the electric consumption of each component. If there is a problem, refer to "Troubleshooting" on page G-58.

- 7. Open the bottom front door to access the pressure and temperature gauges of the HP and LP circuits. Refer to "Opening and Closing the Access Doors" on page G-26.
- 8. A few minutes after start up, check that the equivalent temperature of the refrigerant gas, measured at the pressure inside the finned coil with fans running at full speed, differs from the outside air temperature of about 7-10°C.
- 9. Verify that the equivalent temperature of the refrigerant gas, measured at the pressure in the plate heat exchanger, differs from the temperature of the water outlet from the exchanger of about 3-5°C.
- 10. After several hours of operation, check that the sight glass has a green colour core: if the core is yellow moisture is present in the circuit. Refer to "Troubleshooting" on page G-58.

Follow-on Task(s):

Close all open doors, refer to "Opening and Closing the Access Doors" on page G-26.

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Safety Requirements for Maintenance



- Inspection and maintenance tasks must be carried out by a qualified and certified professional according to the frequency indicated in the maintenance table provided in this manual.
- In accordance with E.U. regulations on the fluorinated greenhouse gases, this unit is subject to the following regulatory obligations, which have to be fulfilled by all operators:
 - Keep records of the equipment
 - Carry out the correct installation, maintenance and repair of equipment
 - Perform regular leakage control
 - Perform refrigerant recovery and disposal management
 - Submit to the Ministry of Environment the annual declaration concerning the atmospheric emissions of fluorinated greenhouse gases.
- Once the inspection and maintenance tasks are complete, ensure that all removed components are reinstalled and all connections are tight and secured.
- Always wear appropriate personal protective equipment to perform maintenance or repair tasks.



- Before performing any maintenance operation, shut down the unit using the appliance on/off switch and isolate the electrical supply of the appliance through the external power-cutting device (fuse, circuit-breaker, etc.), unless power is required for the procedure (it will then be indicated in the procedure).
- Do not touch the unit with any wet body parts when it is supplied with electrical power.



- The maintenance of the unit and its components must be carried out by a qualified professional.
- Defective parts and components may only be replaced by genuine factory parts or parts approved by the manufacturer.
- Replace any gaskets or seals present on the removed components before reinstallation, unless otherwise specified in the procedures.
- If the taps of the refrigerant circuit need to be closed for maintenance, make sure to tag the taps in order to indicate that they are closed. All taps must then be reopened before start-up of the unit.
- To ensure the performance, durability and reliability of the unit, it is recommended that the end-user perform the periodic checks mentioned in the Safety section for the user, at the beginning of this manual.
- The minimum pressure of the primary circuit is between 1 and 2 bars when cold.
- If the water circuit needs to be topped up, allow the unit to cool down and only add small quantities of water at a time. Adding a large quantity of cold water in a hot appliance can damage the appliance permanently.
- If the unit remains unused during the winter period, the water contained in the pipes may freeze and cause serious damage. Fully drain the water from the pipes, checking that all parts of the circuit are empty including any internal or external traps and siphons.
- If leak detection instruments are installed on the system, they must be inspected at least once a year, to ensure their correct operation.



The inspection and maintenance tasks are detailed in a table in this section. Make sure to perform all the recommended tasks and to fill in the log sheets available at the end of the manual with all the required information.

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General Maintenance & Inspection Tasks

Safety requirements:

















Tasks	Visual inspection	Pressure test	Leaks
Intervention with possible effects on the mechanical strength or after use change or in case the machine has not being working for more than two years	Х	X	V
Replace all the components which are not suitable any more. Do not carry out checks at a higher pressure than the one indicated in the project.	X	X	X
Repair, or significant adjustments of the system, or its components.			
The check may be limited to the interested parts, but if a leakage of refrigerant is detected, a leakage search must be carried out on the entire system	Χ	Χ	Χ
Inspection after installation in a different position than the original one.	X		Χ
Leak search, following a well-founded suspicion of refrigerant leakage.			
It is recommended to examine the system for leakage, either directly (use of leak detection systems) or indirectly (deduction of leakage based on analysis of operating parameters), focusing on the parts most prone to leakage (e.g. connections)	Х		Χ



If a defect is detected that compromises the reliable operation of the unit, the unit cannot be re-started until it has been repaired.

Maintenance

Specific Maintenance Tasks

Tools		Months	;	Ye	ars	4.0
Tasks	1	2	6	1	5	AR
Electrical System						
Check that the unit works properly and that there are no active warnings	Χ					
Visually inspect the unit	Χ					
Check noise and vibration level of the unit				X		
Check operation of safety features and of interblocks				X		
Check the unit's performance				X		
Check the current draws of the different parts (compressors, fans, pumps, etc.)				X		
Check the supply voltage of the unit			X			
Check tightness of cables in their clamps			X			
Check the integrity of the insulating coating of power cables				X		
Check the conditions and functioning of the counters				X		
Check functioning of the microprocessor and of the display			X			
Clean the electrical and electronic components of any dust				X		
Check functioning and calibration of probes and transducers				Χ		









_ /		Months	3	Ye	ars	4.5
Tasks	1	2	6	1	5	AR
Condensing coils and fans						
Visually inspect the coil	Χ					
Clean finned coils (1)			X			
Check the water flow and/or any leaks	Χ					
Check that the flow switch is working properly			X			
Clean the metal filter on the water line (3)			X			
Check noise and vibration level of the fans				X		
Check the supply voltage of the fans			Х			
Check the fans' electrical connections				X		
Check functioning and calibration of the fans' speed adjustment system (if present)				X		
Check 4-way valve operation (if present)				X		
Check air presence in the hydraulic circuit	X					
Check colour of moisture indicator on liquid line				X		
Check for freon leaks (2)						Χ

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Teals	Months			Years		4.0
Tasks	1	2	6	1	5	AR
Compressors						
Visually inspect compressors				X		
Check noise and vibration level of the compressors				X		
Check the supply voltage of the compressors			Χ			
Check the compressors' electrical connections				X		
Check oil level in the compressors using the oil fill level indicator			Χ			
Check that the crankcase heaters are powered and working properly				Χ		
Check the conditions of the compressors' power cables and their tightness in the clamps			Х			

Repair of the Refrigerant Circuit











Caution :



Conditions:





Perform leak detection by charging the system with nitrogen, either at the high or low pressure side, using a gas bottle with a pressure reducing valve, until 15 bar pressure is reached.

Any leakage is detected using a bubble leak finder If bubbles appear discharge the nitrogen from the circuit before brazing using the proper alloys



- Avoid oil replenishment with products that are different from that specified and that are pre-loaded into the compressor
- In the event of a gas leakage on machines using refrigerant R.407C, even if it is only a partial leak, do not top up The entire charge must be recovered, the leak repaired and a new refrigerant charge weighed in to the circuit

- When replacing any part of the refrigerant circuit, do not leave it exposed for more than 15 minutes.
- It is important when replacing a compressor that the task be completed within the time specified above after removing the rubber sealing caps.
- When replacing the compressor following a burn out, it is advisable to wash the cooling system with appropriate products including a filter for acid.
- When under vacuum do not switch on the compressor.

Operation Modes

Cooling mode

When the key * is depressed, the corresponding icon appears on the display; the Cooling mode is activated.

If requested, the compressor safety delay countdown starts and the compressor icon flashes.

The water pump will be activated after few seconds, and then, once the compressor countdown has finished, the compressor starts and the icon remains on.

The display shows the user water inlet temperature and Domestic hot water inlet temperature

Heating mode

When the key is depressed, the corresponding icon appears on the display; the Heating mode is activated.

If requested, the compressor safety delay countdown starts and the compressor icon flashes.

The water pump will be activated after few seconds and then, once the compressor countdown has finished, the compressor starts and the icon remains on.

The display shows the user water inlet temperature and Domestic hot water inlet temperature.



At the first start up, the unit microprocessor control checks the domestic hot water inlet temperature measured by the sensor BTS (this has priority over the other parameters) and, if the measured temperature is lower than the domestic hot water set point, it will activate the domestic hot water mode automatically.

If the unit is required to operate in heating and the domestic hot water temperature is higher than the setpoint (there is no requirement for domestic hot water), the microprocessor control will activate the unit in heating mode.

If the unit is required to operate in cooling and domestic hot water mode the microprocessor control will activate both functions at the same time. If domestic hot water is not required, the microprocessor control will activate cooling mode only.

In stand-by mode, the controller gives the possibility to:

- display the set values
- manage alarms, their display and reports

Reset values

Device		Set- point	Differ- ential	Reset
Heating mode	°C	35	2	
Domestic hot water mode	°C	50	2	
Cooling mode	°C	23	2	
Anti-freeze ther- mostat	°C	4,5	4	Manual
High pressure switch	Bar	45	7	Automatic x3 times
Low pressure switch	Bar	5,7	1,3	(then man- ual)
Water safety valve (Present in A versions only)	Bar	6,0		Automatic

Setpoints

Function	Adjustment limit	Default value	
Heating set-point	10+55°C	35°C	
Domestic hot water set- point	20+55°C	50°C	
Cooling set-point	10+25°C	23°C	
Set point compensation	0+15°C	10°C	
Password	(Contact AIC)		



All set points refer to the return temperature from the system:

- > In case hot water at 45°C is requested and the Δt is 5°C, then the set point must be set at 40°C.
- > In case the Δt is 8°C, then the set point must be set at 37°C.
- > In case cold water is requested, for example at 15°C and the Δt is 5°C, then the set point must be set at 20°C.
- > If the Δt is 8°C, then the set point must be set at 23°C.

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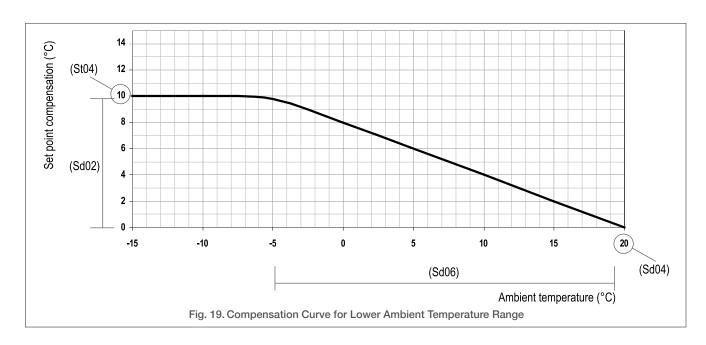
Weather Compensation Function

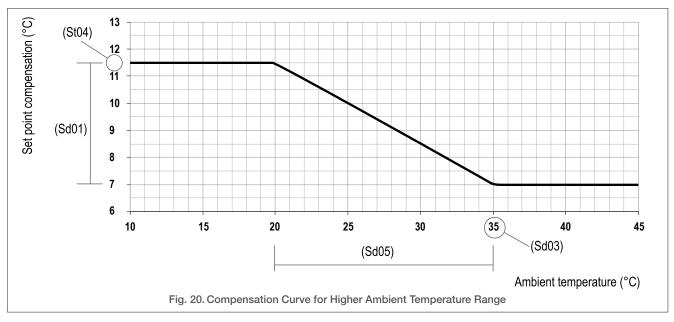
This function makes it possible to activate the weather compensation sensor in order to optimize the efficiency of the unit. It automatically modifies the set-point value with respect to the external air temperature: a calculation is performed on the set-point to provide a revised value of set point for higher ambient conditions.

It also allows to save energy and to operate the unit in severe ambient conditions. This function is only active in heating mode. All units are factory set with the weather compensated function activated. The slope starts at +20°C with a differential of 10°C.



With the energy saving mode activated, if the SET key is pressed twice the bottom of the display shows the SETR (weather compensated set point) label that is the specific set point calculated by the microprocessor control for the measured ambient temperature condition.



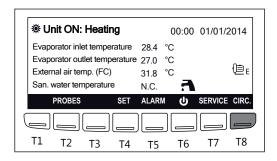


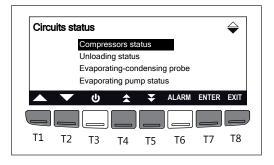
Operation of the Control Panel - Engineer Level

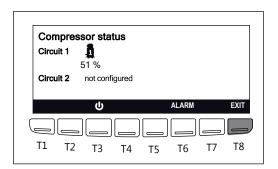


- For the meaning of the icons and functions displayed on the screen, refer to "Symbols and Functions on the Control Panel" on page G-13.
- Basic operations that can be performed at end user level are described in "Operating the Controller End User Level" on page G-19.
- In some cases, a password is required to access setup or reset functions. Please contact your AIC representative for more information.

Reading System Data - CIRC Function







Depress:

78 (CIRC) to access data related to the circuits:

- Compressor status
- Unloading status
- Evaporating-condensing probe
- Evaporating Pump status
- Condenser fan

Depress:

T4 () /T5 () to scroll through the pages

T1 () / T2 () to scroll through the displayed lines.

77 (ENTER) to confirm the line selection and access the line-related screen.

78 (EXIT) to exit the menu go back to the home screen.



Only the Compressor Status screen is shown here as an example, but each line has its own dedicated screen.

Compressor Status:

- A black icon indicates an active status
- > A white icon indicates an inactive status (standby)

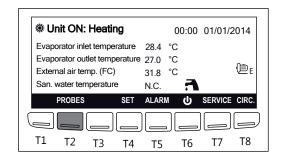
If the compressors are used in part-load (e.g. screw compressors), an additional icon is displayed to show the level of step control.

If the compressors are of the On/Off type (Scroll) no icon is displayed next to the compressor.

78 (**EXIT**) to exit the menu go back to the previous screen

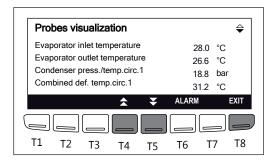
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Reading System Data - PROBES Function



Depress:

72 (PROBES) to read the data collected through the sensors installed in the system.

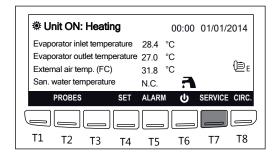


Depress:

T4 (♠) /T5 (♥) to scroll through the pages

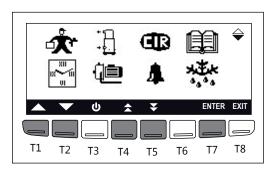
78 (♠EXIT) to exit the menu and return to the home screen

Accessing the Service Functions



Depress:

77 (SERVICE) to access the Service screen

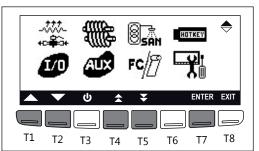


Depress:

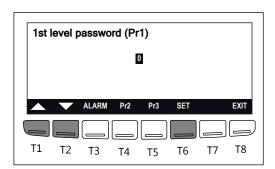
T1 () / T2 () to scroll through the displayed icons.

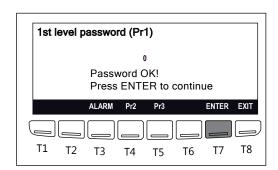
77 (ENTER) to confirm the icon selection and access the related screen.

T4 () /T5 () to toggle between pages 1 and 2

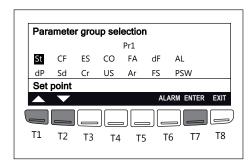


Setting the Service Parameters (🏂)





Service Parameters - Set Points





For the related Weather Compensated function curves (Heating mode only), refer to "Weather Compensation Function" on page G-47.

Depress:

T1 () and T6 (SET) simultaneously to set password to "1".

T6 (SET) to confirm

77 (ENTER) to access the parameter selection screen.



Different access levels are available that allow to change certain sets of parameters. See table below. For Service access code, please contact your AIC representative.

Parameter Code	Meaning	Level
St	Set point	1
dP	Main visualization	Service
CF	Configuration	Service
Sd	Dynamic set	1
ES	Energy saving	1
Cr	Compressor racks	Service
CO	Compressor	Service
US	Auxiliary output	Service
FA	Fan	Service
Ar	Antifreeze	Service
dF	Defrost	Service
FS	Sanitary water	1
AL	Alarms	Service

Depress:

T1 () / T2) to scroll through the functions. and select "St"

77 (ENTER) to access the **Set Point** screen and access the following functions:

- > Summer set point (St01)
- Winter set point (St04)
- Summer regulation band (St07)
- Winter regulation band (St08)

T1 () / T2 () to scroll through the functions

T7 (SET) to enable value change.

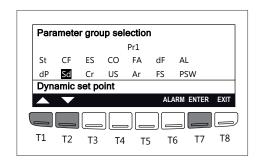
T1 () / T2 () to perform the value adjustment.

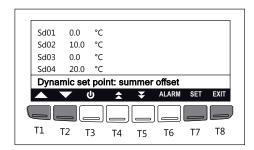
T7 (SET) to validate the change

78 (EXIT) to exit the menu and return to the previous screen

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Service Parameters - Dynamic Set Points







For the related Weather Compensated function curves (Heating mode only), refer to "Weather Compensation Function" on page G-47.

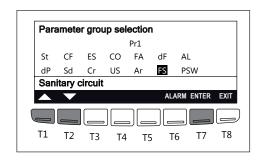
Depress:

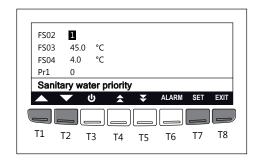
T1 () / T2 () to scroll through the functions. and select "Sd"

77 (ENTER) to access the Dynamic Set Point screen and access the following functions:

- > Dynamic set point: summer offset (Sd01)
- > Dynamic set point: winter offset (Sd02)
- Dynamic set point: summer outside temp (Sd03)
- > Dynamic set point: winter outside temp (Sd0.4)
- > Dynamic set point: summer differential temp (Sd05)
- Dynamic set point: winter differential temp (Sd06)
- T1 () / T2 () to scroll through the functions
- T7 (SET) to enable the value change.
- T1 () / T2 () to perform the value adjustment.
- T7 (SET) to validate the change
- **78** (**EXIT**) to exit the menu and return to the previous screen

Service Parameters - Sanitary Circuit





Depress:

T1 () / T2 () to scroll through the functions. and select "FS"

77 (ENTER) to access the Sanitary Circuit screen and access the following functions:

- > Sanitary water priority (FS02)
- > Sanitary water set point (FS03)
- > Sanitary water proportional band (FS04)

T1 () / T2 () to scroll through the functions

T7 (SET) to enable the value change.

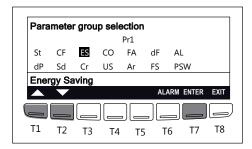
T1 () / T2 () to perform the value adjustment.

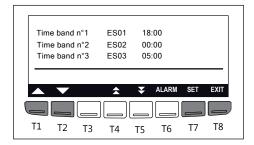
T7 (SET) to validate the change

78 (**EXIT**) to exit the menu and return to the previous screen

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Service Parameters - Energy Saving





Depress:

T1 () / T2 () to scroll through the functions. and select "ES"

77 (ENTER) to access the Energy Saving screen.

This function allows to set the system in two different operating modes:

- ▶ Automatic On-Off the unit goes On/Off according to set times.
- ▶ Energy Saving two different set points can be set, one for the day and one for the night.
- T1 () / T2 () to scroll through the functions
- T7 (SET) to enable the value change.
- T1 () / T2 () to perform the value adjustment.
- T7 (SET) to validate the change
- **78** (**EXIT**) to exit the menu and return to the previous screen



Also refer to "Setting the Time and Date" on page G-21 for Time band parameter reading.

Up to three time bands can be set.

Parameter code	Meaning
ES01	Start of operating range N°1 (0+2.4)
ES02	End of operating range N°1 (0+2.4)
ES03	Start of operating range N°2 (0+2.4)
ES04	End of operating range N°2 (0+2.4)
ES05	Start of operating range N°3 (0+2.4)
ES06	End of operating range N°3 (0+2.4)
ES07	Monday with energy saving time band Monday operation with automatic on/off
ES08	Tuesday with energy saving time band Tuesday operation with automatic on/off
ES09	Wednesday with energy saving time band Wednesday operation with automatic on/off
ES10	Thursday with energy saving time band Thursday operation with automatic on/off
ES11	Friday with energy saving time band Friday operation with automatic on/off
ES12	Saturday with energy saving time band Saturday operation with automatic on/off
ES13	Sunday with energy saving time band Sunday operation with automatic on/off
ES14	Increased energy saving set in chiller operation
ES15	Differential energy saving set in chiller operation

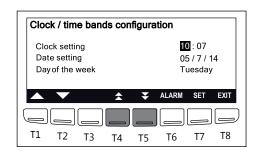
Parameter code	Meaning
ES16	Increased energy saving set in heat pump operation
ES17	Differential energy saving set in heat pump operation
ES18	Maximum unit operating time in OFF by RTC if forced into ON by button
ES19	Time band 1 DHW: start
ES20	Time band 1 DHW: end
ES21	Time band 2 DHW: start
ES22	Time band 2 DHW: end
ES23	Time band 3 DHW: start
ES24	Time band 3 DHW: end
ES25	Monday: time band selection
ES26	Tuesday: time band selection
ES27	Wednesday: time band selection
ES28	Thursday: time band selection
ES29	Friday: time band selection
ES30	Saturday: time band selection
ES31	Sunday: time band selection
ES32	Energy saving: offset DHW setpoint

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Clock/Time Bands (Clock/Time Ba



Also refer to "Setting the Time and Date" on page G-21.



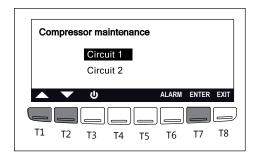
Clock / time bands of	onfiguration	
	Start	Stop
Time band n°1	18:00	00:00
Time band n°2	05:00	19:00
Time band n°3	00:00	08:00
2	¥ ALAF	RM EXIT
T1 T2 T3 T4	1 T5 T6	T7 T8

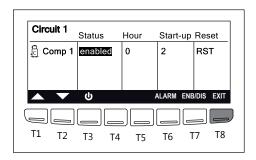
Depress:

T4 (♠)/T5 (♥) to read the info about the Energy saving, ON/OFF scheduling and time bands on other screens. Any modification is subjected to an access password. Please contact your AIC representative

78 (EXIT) to exit the menu

Compressor maintenance (1)





Depress:

T1 () / T2 () to scroll through the lines

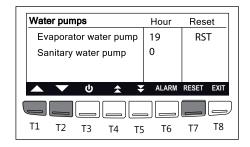
77 (ENTER) to access the Circuit status screen.



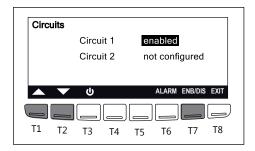
The disabling function can only be used by Service personnel

78 (**EXIT**) to exit the menu and return to the previous screen

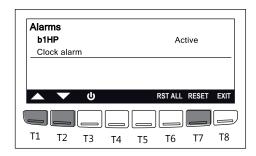
Water Pump (🕮)



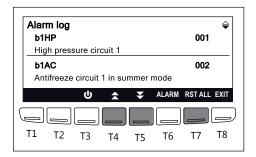
Circuit maintenance (



Alarms (🦺)



Alarm log (



Depress:

T1 () / T2 () to scroll through the lines and display the water pumps working hours

77 (RESET) to reset the counter.



The Reset function can only be used by Service personnel

78 (**EXIT**) to exit the menu and return to the previous screen

Depress:

T1 () / T2 () to scroll through the lines and display the circuits working hours

77 (ENB/DIS) to reset the counter.



The Enable/Disable function can only be used by Service personnel

78 (EXIT) to exit the menu and return to the previous screen

Depress:

T1 () / T2 () to scroll through the lines

77 (RESET) to reset the alarm.



The Reset All function can only be used by Service personnel. Also refer to "Resetting an Alarm - ALARM Function" on page G-20.

78 (**EXIT**) to exit the menu and return to the previous screen



If an alarm buzzer is sounding, it can be stopped by pressing and releasing any of the kevs.

Depress:

T4 (♠) /T5 (♥) to scroll through the pages of the log (up to 99 errors in the log)

77 (RSTALL) to reset the alarm.

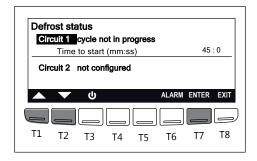


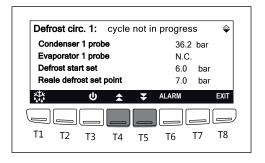
The Reset All function can only be used by Service personnel. Also refer to "Resetting an Alarm - ALARM Function" on page G-20.

78 (EXIT) to exit the menu and return to the previous screen

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Defrost (**)





Depress:

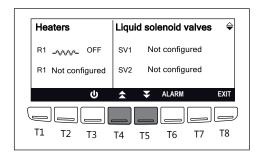
T1 () / T2 () to scroll through the lines

77 (ENTER) to access the **Defrost status** screen of the selected circuit.

Depress:

T4 (♠) /T5 (♥) to scroll through the pages and read the parameters

78 (EXIT) to exit the menu and return to the home screen

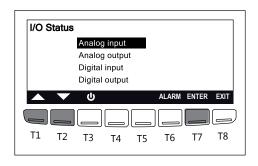


Depress:

T4 () /T5 () to scroll through the pages and read the parameters

78 (EXIT) to exit the menu and return to the home screen

Input/Output Status (1/0)



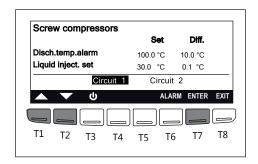
Depress:

T1 () / T2 () to scroll through the lines

77 (ENTER) to access the screen of the selected line and read the parameters:

- Probes status
- Analog input and output
- Digital input and output

Screw Compressor () - if available



Depress:

T1 () / T2 () to scroll through the lines

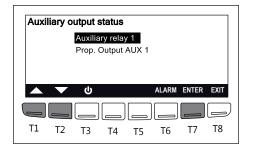
77 (ENTER) to access the Screw Compressor screen of the selected circuit.

The main screen can display the discharge temperature and the liquid injection set point.

Depress:

78 (**EXIT**) to exit the menu and return to the home screen

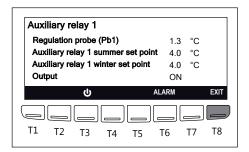
Auxilliary Output (AUX)



Depress:

T1 () / T2 () to scroll through the lines

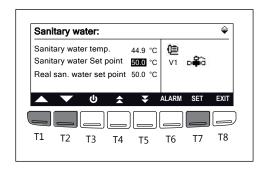
77 (ENTER) to access the info of the selected line.



Depress:

78 (EXIT) to exit the menu and return to the home screen

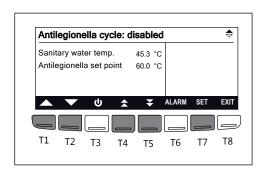
Sanitary Water (SAN)



Depress:

T1 () / T2 () to scroll through the lines

77 (ENTER) to access the Sanitary water regulation parameters.



Depress:

T7 (SET) to enable the value change.

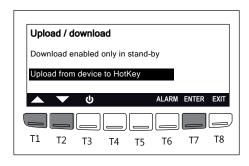
T1 () / T2 () to perform the value adjustment.

T7 (SET) to validate the change

T4 () /T5 () to scroll through the pages and read the parameters

78 (**EXIT**) to exit the menu and return to the home screen

Upload/Download (HOTKEY)



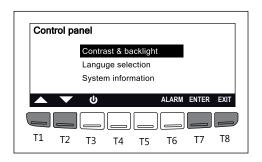
Depress:

T1 () / T2 () to scroll through the lines
T7 (ENTER) to activate the function.



The Upload/Download function can only be used by Service personnel.

Control Panel ()



Depress:

T1 () / T2 () to scroll through the lines

T7 (ENTER) to activate the function.



The Control Panel functions are already described in the end-user section, in "Screen and Language Setup" on page G-22.

Additional Information for the Installer

Troubleshooting

Code	Alarm Description	Cause	Solution		
ACF1	Configuration alarm	Wrong configuration of microprocessor control system	Contact your AIC representative		
ACF2	Configuration alarm				
ACF3	Configuration alarm				
ACF4	Configuration alarm				
ACF5	Configuration alarm				
ACF6	Configuration alarm				
ACF7	Configuration alarm				
ACF8	Configuration alarm				
ACF9	Configuration alarm				
AEE	Eeprom alarm	Severe hardware damage in the microprocessor control system	Switch OFF the unit and, after few second switch ON the unit; if the alarm appears again contact the service		
AEFL	User water flow switch alarm	Presence of air or dirtiness in the user hydraulic system	Bleed carefully the user hydraulic system or check and clean the water strainer		
AEUn	Compressor unloading alarm	User water temperature is too high	Wait until the user water temperature is lower		
AHFL	Domestic hot water flow switch alarm	Presence of air or dirtiness in the user hydraulic system	Bleed carefully the user hydraulic system or check and clean the water strainer		
AP1	Alarm user inlet water temperature sensor				
AP10	Alarm safety domestic hot water sensor				
AP2	Alarm user outlet water temperature sensor		Check the electrical connection of		
AP3	Alarm pressure transducer	Wrong electrical connection, Sensor defect	the sensor to the terminal board, if correct call the service to replace the sensor.		
AP4	Alarm finned coil sensor / defrost sensor	- Gorisor dolloc			
AP5	Alarm domestic hot water inlet temperature sensor				
AP6	Alarm domestic hot water outlet temperature sensor				
AP7	Alarm ambient sensor				
AP8	Not used	. Wrong electrical connection,			
AP9	Not used		Check the electrical connection of the sensor to the terminal board, if correct call the service to replace the sensor.		
AtE1	Evaporator water pump 1 overload	Sensor defect			
AtE2	Evaporator water pump 2 overload				

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Additional Information for the Installer

Code	Alarm Description	Cause	Solution	
B1 HP	High pressure switch circuit 1	In heating mode: Insufficient user circuit water flow; Insufficient domestic hot water circuit water flow In cooling mode: Insufficient air flow at the source fan; Insufficient domestic hot water circuit water flow	Restore the correct user circuit water flow	
b1AC	Anti-freeze alarm circuit 1 (cooling mode)	Too low water temperature	Check user temperature set point; Check user water flow	
b1AH	Anti-freeze alarm circuit 1 (heating mode)	Too low water temperature	Check user temperature stet point	
b1dF	Wrong defrost circuit 1 (maximum time admitted)	Defrost time too long; Outside temperature outside the working limits; Refrigerant charge leakage	Check defrost set point; Restore normal working conditions; Find leakage and repair	
b1hP	High pressure transducer alarm circuit 1	Transducer defect	Replace the faulty transducer	
B1LP	Low pressure switch circuit 1	Refrigerant charge leakage	Find leakage and repair	
b1IP	Low pressure transducer alarm circuit 1	Transducer defect	Replace the faulty transducer	
b1tF	Overload source fan alarm	Fan input current outside operation limits	Check the proper operation of the source fan and, in case replace it	
C1tr	Compressor 1 overload	Compressor 1 input current outside operation limits	Replace the compressor	
C2tr	Compressor 2 overload	Compressor 1 input current outside operation limits	Replace the compressor	
_	Sight glass core is yellow	Moisture is present in the circuit	Dehydration of the circuit is required to be performed by qualified people only	
_	Continuous vapour bubbles present at the sight glass	shortage of refrigerant	Тор-ир	
_	Rotation of the compressors is incorrect		disconnect the main switch and change over any two phases of the incoming main supply to reverse motor rotation (only for units with three-phase fan motors	

Additional Information for the Installer

Installation Checklist

	Unit	Values/Comments
General/heating system		
Type of building/system		
Commercial purpose (Y/N) ?		
Year of manufacture		
Output of system	kW	
Heated surface	m ²	
Number of heating circuits:		
 Floor heating 		
 Radiators 		
• Other		
Cascade (Y/N)? Number of appliances?		
Water		
Water hardness at start up	mol/m³ or mg/l	
System volume	L	
Additive(s)/Antifreeze (Y/N)?		
• Туре		
 Quantity 	%	
Gas		
Туре?		
Heating value	kWh/m³	
Gas pressure regulator installed (Y/N)? Type?		
Hydraulics		
Heating circuit normal pressure	bar	
Air purged from the system (Y/N)?		
Safety valve installed (Y/N)? rating?	bar or kW	
Expansion tank(s) installed (Y/N)? Type(s) ?		
• Size?	L	
Precharged pressure?	bar	
Number		

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	Unit	Values/Comments
Plate heat exchanger in the system (Y/N)? Type?		
Low loss header in system (Y/N)? Type?		
Number of mixers ?		
Buffer tank (Y/N)? Size?	L	
DHW tank (Y/N)? Type?	L	
Pump(s) (Y/N)? Type?		
In which circuit(s)		
 Chosen according to require- ments for the appliance? 		
Flue gas		
Open or closed system?		
Dimensions of combustion air openings if closed system	cm ²	
Material of flue piping		
Diameter and length of piping system	mm / m	
Chimney system engineered by?		
Calculated pressure drop, including maximum wind condition (<200 Pa)?	Pa	
Cascade (Y/N)?		
Back-flow preventer or non-return valve installed (Y/N)? Type?		
Condensates		
Condensate discharge slope	° or cm/m	
Condensate trap filled (Y/N)?		
Neutralisation system installed (Y/N)? Type?		
Condensate pump installed (Y/N)?		
Condensate pump control line connected (Y/N)?		

	Unit	Values/Comments
Controller		
Appliance controller?		
Other controller (Y/N)? Type?		
Optional modules installed (Y/N)		
• Type?		
Optional items installed (Y/N)?		
• Outdoor sensor (Y/N)? Type?		
Room unit(s) (Y/N)? Type?		
Others?		
Miscellaneous		
The end user has received all relevant information (Y/N)?		
The end user has received all relevant documents (Y/N)?		
Name		
Date		
Signature		
NOTES		

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NOTES

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