AERMEC
air conditioning

REGOLAZIONE ELETTRONICA • ELECTRONIC REGULATION • REGLAGE ELECTRONIQUE
ELEKTRISCHE REGELVORRICHTUNG • REGULACIÓN ELÉCTRICA

MANUALE USO • USAGE MANUAL • MANUEL D'UTILISATION
BEDIENUNGSANLEITUNG • MANUAL DE INSTRUCCIONES

MODUCONTROL

AERMEC
COMPANY QUALITY SYSTEM
ICIM
ISO 9001:2000 - Cert. n° 0128/5
CISQ IQNet
AERMEC S.P.A.

CE

IT GB FR DE ES

IMDCFJ. 1008 - 6343841_01 Ver - 4.22

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MODUCONTROL

NUMERO DI SERIE	

DICHIARAZIONE DI CONFORMITÀ CE

Noi, firmatari della presente, dichiariamo sotto la nostra esclusiva responsabilità che l'insieme in oggetto così definito:

NOME MODUCONTROL

TIPO Scheda elettronica per refrigeratore ARIA/ACQUA, pompa di calore

Al quale questa dichiarazione si riferisce è conforme alle seguenti norme armonizzate:

CEI EN 60730-1	Norma di sicurezza
CEI EN 61000-6-1 **CEI EN 61000-6-3**	Immunità ed emissione elettromagnetica per l'ambiente residenziale
CEI EN 61000-6-2 **CEI EN 61000-6-4**	Immunità ed emissione elettromagnetica per l'ambiente industriale

Soddisfacendo così i requisiti essenziali delle seguenti direttive:

- Direttiva LVD: 2006/95/CE
- Direttiva compatibilità elettromagnetica 2004/108/CE

Bevilacqua 15/01/2008

Direttore Commerciale
Firma

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MODUCONTROL

SERIAL NUMBER	

EC DECLARATION OF CONFORMITY	We, the undersigned, declare on our own exclusive responsibility that the object in question, so defined:
NAME	MODUCONTROL
TYPE	Electronic card for AIR/WATER chiller, heat pump

And to which this declaration refers, complies with the following standardised regulations:

CEI EN 60730-1	Safety Regulation
CEI EN 61000-6-1 **CEI EN 61000-6-3**	Electromagnetic immunity and emission in residential environment
CEI EN 61000-6-2 **CEI EN 61000-6-4**	Electromagnetic immunity and emission in industrial environment

thus meeting the essential requisites of the following directives:

- LV Directive: 2006/95/EC
- Electromagnetic Compatibility Directive 2004/108/EC

Bevilacqua 15/01/2008

Marketing Director
Signature

English

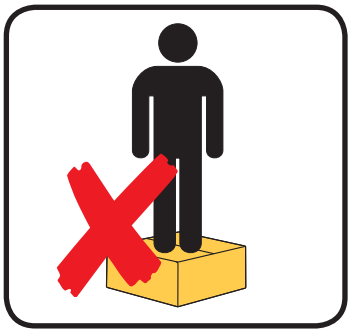
Contents

Contents

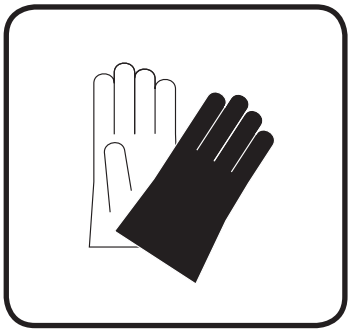
Precautions and safety regulations

DO NOT dampen the packaging

DO NOT tread on the packaging



Handle with care



Disposal information

Caution: this product contains electrical and electronic equipment that may not be disposed of through normal municipal rubbish collection channels. There are special centres for the separate collection of this material.

The electrical and electronic apparatus must be treated separately and in accordance with the relevant legislation in force in the country the apparatus is installed in.
Batteries or accumulators in the apparatus must be disposed of separately in accordance with local regulations.

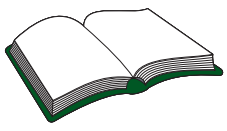
Safety symbols

Danger: power supply

Warning

Danger: moving parts

Notes regarding the documentation



Store the manuals in a dry location to avoid deterioration, as they must be kept for at least 10 years for any future reference.

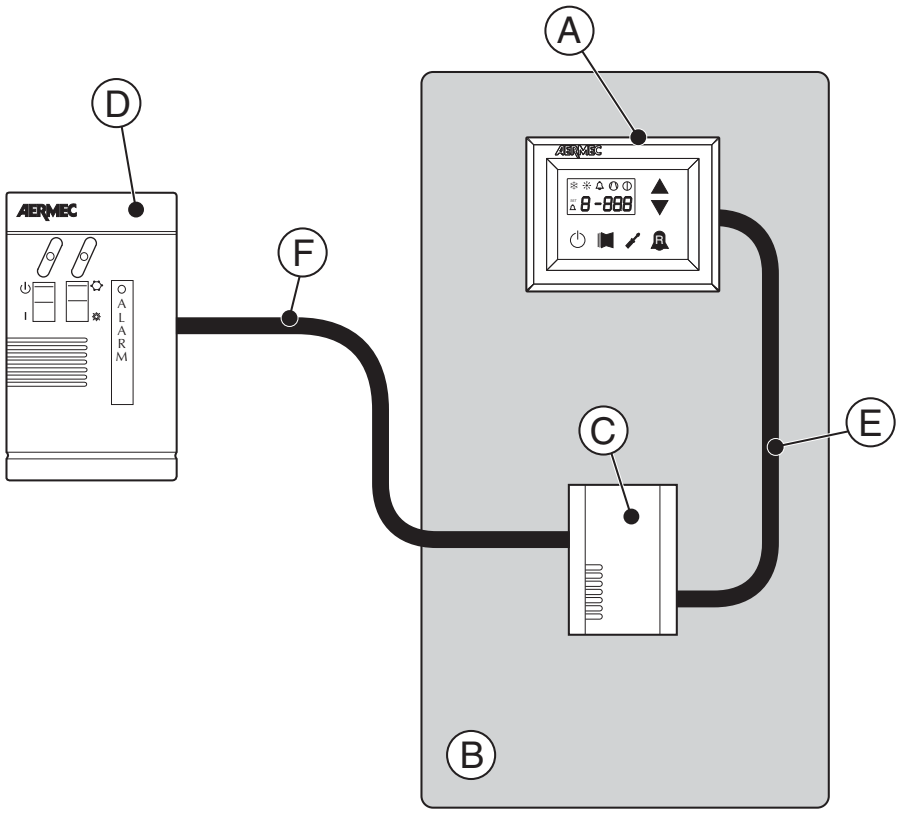
Carefully and thoroughly read all the information referred to in this manual. Pay particular attention to the usage instructions accompanied by the words "DANGER" or "WARNING" because, if not observed, they can cause damage to the machine and/or property and/or injury to people. If any kind of malfunction is not included in this manual, contact the local After Sales Service immediately.
The device must be installed in such a way that maintenance and/or repair operations are possible.

The warranty of the device does not in any case cover costs owing to ladder trucks, lifts or other lifting systems that may be required in order to carry out the interventions under guarantee. AERMEC S.p.A. declines all liability for any damage due to improper use of the machine, or the partial or superficial reading of the information contained in this manual.

Characteristics of the regulation

The command panel of the unit allows the rapid setting of the working parameters of the machine, and their visualisation. The display consists of 4 figures and various LEDs for indicating the type of operational mode, the visualisation of the parameters set and of any alarms triggered. The card stores all the default settings and any modifications. With the installation of the PR3 remote panel accessory, it is possible to control the switching on and off from a distance, as well as the setting of the operational mode (cooling-heating), and the visualisation of the alarm summary. After the absence of voltage for any period of time, the unit is able to start up again automatically, maintaining the original settings.

User interface



Contents	Functions
A	Panel on the machine
B	Chiller / Heat pump
C	Moducontrol
D	PR3 remote panel
E	Internal connection between moducontrol and panel (already wired in the factory)
F	Connection between the unit and PR3, with a maximum length of 150 metres (wiring to be carried out by the installer)

USER MENU default settings

USER menu - (Password 000)																
Heat recovery unit	StA	StF	bnF	StC	bnC	CSt	SF1	tF1	SF2	tF2	SC1	tC1	SC2	tC2	SAS	bAS
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
ANL	0	7	5	45	5	0	12	18	7	30	45	0	35	18	50	10
ANLI	0	7	5	45	5	0	12	18	7	30	45	0	35	18	50	10
ANR	0	7	5	45	5	0	12	18	7	30	45	0	35	18	50	10
ANF	0	7	5	45	5	0	12	18	7	30	45	0	35	18	50	10
ANK	0	7	5	45	5	0	12	18	7	30	45	0	35	18	50	10
SRPV1 SRA	1	–	–	65	5	0	12	18	7	30	45	0	35	18	50	10

String index	Meaning of parameter	Contents index	Meaning of parameter
0 - StA	Selection of operational mode	8 - SF2	Cooling setpoint 2
1 - StF	Cooling setpoint	9 - tF2	Outside air temperature 2 (cooling)
2 - bnF	Cooling band	A - SC1	Heating setpoint 1
3 - StC	Heating setpoint	B - tC1	Outside air temperature 1 (heating)
4 - bnC	Heating band	C - SC2	Heating setpoint 2
5 - CSt	Setpoint correction	D - tC2	Outside air temperature 2 (heating)
6 - SF1	Cooling setpoint 1	E - SAS	Domestic water setpoint
7 - tF1	Outside air temperature 1	F - bAS	Domestic water band

ELECTRIC HEATER default settings

ELECTRIC HEATER menu - (Password 001)							
Heat recovery unit	SrA	brA	Sri	bri	tA1	tA2	bA
	0	1	2	3	4	5	6
ANL	4	1	3	4	5	-30	2
ANLI	4	1	3	4	5	-30	2
ANR	4	1	3	4	5	-30	2
ANF	4	1	3	4	5	-30	2
ANK	4	1	3	4	5	-30	2
SRPV1 SRA	4	1	3	4	5	-20	2

Con-tents index	Meaning of parameter	Contents index	Meaning of parameter
0 - Sra	Anti-freeze electric heater setpoint	4 - tA1	External air temperature setpoint 1
1 - brA	Anti-freeze electric heater band	5 - tA2	External air temperature setpoint 2
2 - Sri	Supplementary electric heater setpoint	6 - bA	Band on air temperature setpoints
3 - bri	Supplementary electric heater band		

Parameters only visible in heat pump models

Parameters only visible in models producing hot domestic water

INSTALLER MENU default settings

INSTALLER menu - (Password 030)														
Heat recovery unit	iu	oFF	oFC	SAF	int	dEr	AG	FrP	rin	PAN	ASA	ASP	AAS	TRA
	0	1	2	3	4	5	6	7	8	9	A	B	C	D
ANL	0	4	54	5	600	0	3	3	0	0	1	70	0	0
ANLI	0	4	54	5	600	0	3	3	0	0	1	70	0	0
ANR	0	4	58	5	600	0	3	3	0	0	1	70	0	0
ANF	0	4	54	5	600	0	3	3	0	0	1	70	0	0
ANK	0	4	63	5	600	0	3	3	0	0	1	70	0	0
SRPV1 SRA	0	4	65	5	600	0	3	3	1	0	1	70	0	2

INSTALLER menu - (Password 030)														INSTALLER menu 2 (Password 031)		
Heat recovery unit	bAF	tbF	OAE	Ati	SCr	Ad1	Bd1	AS1	LA1	St1	LA2	St2	LSP	-	-	-
	E	F	G	H	I	J	L	N	O	P	Q	R	T	0	1	2
ANL	0	180	45	65	1	1	1	0	-15	43	-10	58	50	6	0	0
ANLI	0	180	45	65	1	1	1	0	-15	43	-10	58	55	6	0	0
ANR	0	180	45	65	1	1	1	0	-15	43	-10	58	55	6	0	0
ANF	0	180	45	65	1	1	1	0	-15	43	-10	58	55	6	0	0
ANK	0	180	45	65	1	1	1	0	-20	53	-10	62	60	6	0	0
SRPV1 SRA	0	180	45	58	0	1	1	0	-20	62	-10	65	63	6	0	0

Contents index	Meaning of parameter	Contents index	Meaning of parameter
0 - iu	Regulation Input/Output	E - bAF	Flow switch bypass enabled
1 - oFF	Cooling force-off	F - tbF	Time for flow switch bypass
2 - oFC	Heating force-off	G - OAE	Outside temperature standby
3 - SAF	Reset band of force-off	H - Ati	High temperature of return water
4 - int	Integral time	I - SCr	Screensaver configuration
5 - dEr	Derivative time	J - Ad1	Modbus supervisor address
6 - AG	Anti-freeze	L - Bd1	Supervisor baud rate
7 - FrP	Frost protection	N - AS1	Supervisor write enabled
8 - rin	Supplementary electric heater	O - LA1	Air temperature limit 1
9 - PAN	Remote panel configuration	P - St1	Water temperature limit 1
A - ASA	Enabling domestic water	Q - LA2	Air temperature limit 2
B - ASP	Power for producing domestic water	R - St2	Water temperature limit 2
C - AAS	Input standby time	T - LSP	Maximum heating set point
D - trA	Enabling the room thermostat		

Alarm	Meaning of parameter (INSTALLER menu 2)
0	Delta temperature for reactivating the compressor after FORCE OFF intervention
1	Heating cable configuration
2	Heating cable set point

Parameters only visible in heat pump models

Parameters only visible in models producing hot domestic water

Configurations for units with MODUCONTROL

TABLE OF POSSIBLE CONFIGURATIONS FOR UNITS WITH MODUCONTROL					
Heat recovery unit	Heat pump	Unit with condensation control device	Bicompressor unit	Inverter unit	Production of domestic water
ANL		✔	✔ only sizes greater than model ANL 090		
ANL H	✔	✔	✔ only sizes greater than model ANL 090 H		✔
ANLI	✔	✔		✔	✔
ANR	✔	✔	✔		✔
ANF	✔	✔	✔ only sizes greater than model ANF 090 H		✔
ANK	✔	✔			✔
SRPV1 SRA	✔				✔

WARNING

Remember that the units with an integrated accumulation tank ARE NOT SUITABLE for producing hot domestic water.

User interface and parameter visualisations

The main user interface is represented by a LED panel with capacitive keyboard (touch keys); the visualisations are arranged in three menus:

• READINGS menu (key (C) Fig.1)
Containing the information (visualisation mode only) relating to current unit functioning.

• SETTINGS menu (key (D) Fig.1)
Containing all the parameters that the user can modify according to system requirements; these parameters are grouped together in various sub-menus:
- ***USER menu (Password 000);***
- ***INSTALLER menu (Password 030);***
- ***ELECTRIC HEATER menu (Password 001);***

• ALARM log (key (E) Fig.1)
The alarm log records unit error and/or malfunctioning conditions (whether alarms or pre-alarms).

During normal functioning, the monitor visualises the last parameter modified; if no other keys are pressed for at least 5 minutes, the monitor activates the screensaver mode (this function can be set via the parameter ***(i)*** in the ***INSTALLER menu)***.

To display parameters and/or readings, 4 figures are used; the first is the indicator i.e. a number allowing the user to know which parameter or reading he is visualising (Fig.3).

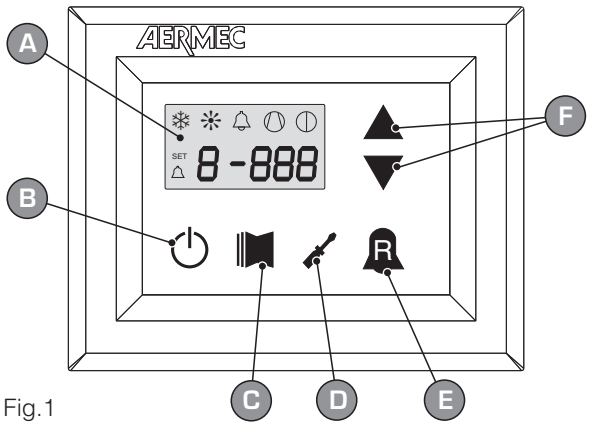


Fig.1

User interface (Fig.1)	
A	Monitor visualisation
B	"ON" key
C	Key to access readings menu
D	Button key to access set menu
E	Button key to access alarm record
F	Keys to scroll/increase-decrease parameters

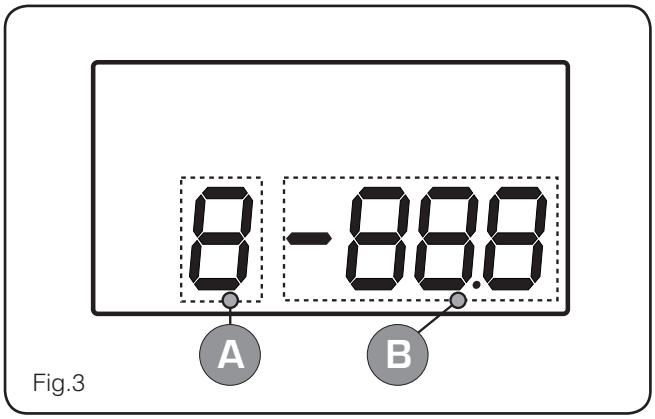


Fig.3

User interface (Fig.3)	
A	Parameter index
B	Parameter abbreviation / Parameter value

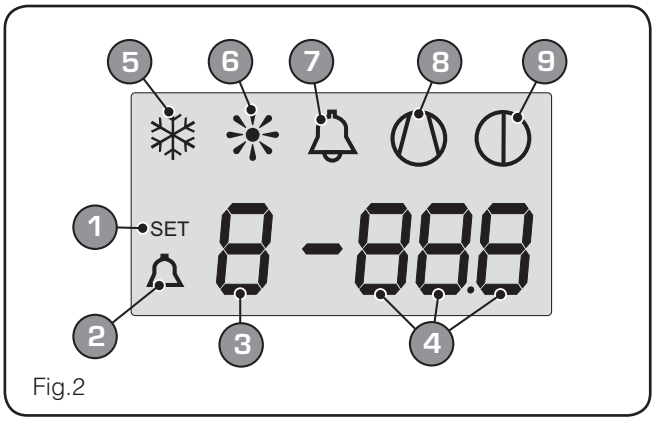


Fig.2

Monitor visualisation (Fig.2)	
1	SETTINGS menu currently visualised
2	ALARMS menu currently visualised
3	Parameter index
4	Parameter abbreviation / Parameter value
5	Season indicator SUMMER
6	Season indicator WINTER
7	Indicator of current alarm status
8	Indicator of current compressor operational mode (this indication can have different flashing frequencies).
9	Indicator of stop in progress

Readings menu

To access the readings menu, press the key in (Fig.4); once the readings menu has been accessed, the monitor will display the readings index and a 3-character string that identifies it; the string will be displayed for one second, after which it is replaced by the value of the reading itself. To move on to the next reading, press the key in (Fig.5); to go back to the previous one, press the key in (Fig.6). Every time you pass from one reading to another, apart from the change in the index value you will also see (for one second) the string identifying the current reading (it is possible, however, to identify any reading via the value of the indicator, comparing it with the table below).

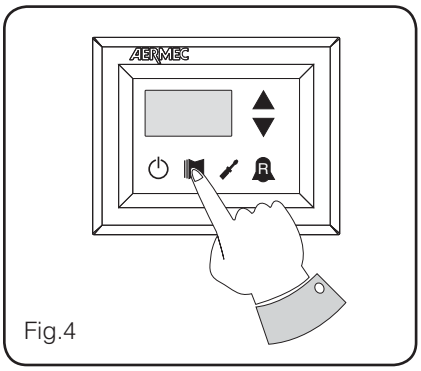


Fig.4

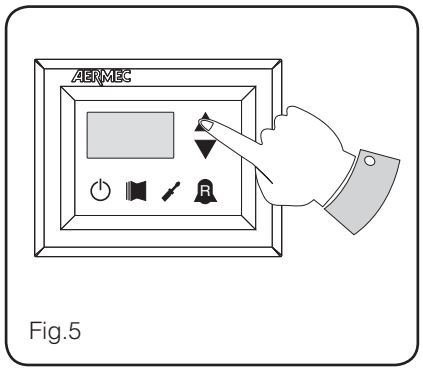


Fig.5

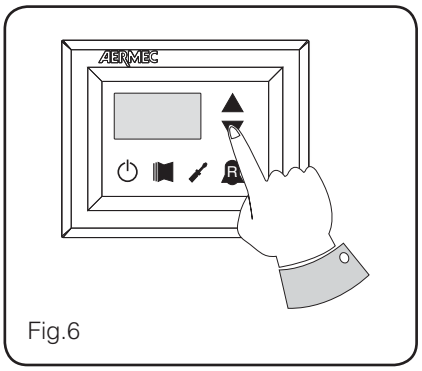


Fig.6

List of indicators and relative readings in the USER MENU (no password)

Index - String		Meaning of the reading
0 tuA		Water output temperature
1 t iA		Water input temperature
2 tSb		Coil temperature
3 tGP		Force gas temperature
4 tAE	☼	Outside air temperature
5 AP	☼	Delivery pressure
6 bP	☼	Suction pressure
7 bEr		Thermostat
8 SAb		Safety band on force-off
9 CP		CP times
A HC0		Hours of operation (thousands)
b HC0		Hours of operation (units)
C SP0		Compressor pickup current (thousands)

Index - String		Meaning of the reading
d SP0		Compressor pickup current (units)
E rEL		Software release
F bLd		Minor software releases
G SEt		Setting currently in use
H dCP	✲	DCP pressure setting
I dCP	✲	DCP pressure differential
J HC1	▮▮	Operating hours COMPRESSOR 2 (thousands)
L HC1	▮▮	Operating hours COMPRESSOR 2 (units)
n SP1	▮▮	Compressor pickup current COMPRESSOR 2 (thousands)
o SP1	▮▮	Compressor pickup current COMPRESSOR 2 (units)
P Po	▮▮	Power fraction
q rFq	∿	Required frequency (INVERTER)
r PrF	☼	Pressure drop

☼ Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

✲ Parameters only visible in the models with DCP installed

▮▮ Parameters only visible in bicompressor models

∿ Parameters only visible in the models with inverter compressor

USER menu

To access the USER menu, press the key in (Fig.7). Once the key has been pressed, you must insert the password to access the various menus; to access the user menu, the **password is 000** (displayed by default). To modify the value of the passwords, use the arrow keys. When you have inserted the correct password, press the key in (Fig.7). The monitor will show the index of the USER parameter and a 3-character string that identifies it; the string will be displayed for one second, after which it is replaced by the value of the parameter itself. To move on to the next parameter, use the arrow keys (Fig.8). To modify a parameter, just select it, press the key in (Fig.7), modify the assigned value using the arrow keys in (Fig.8), and confirm the modification by pressing the key in (Fig.7) again.

PASSWORD = 000

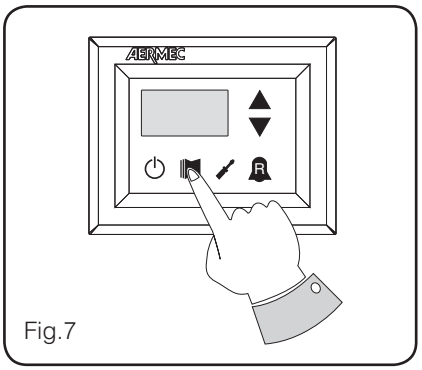


Fig.7

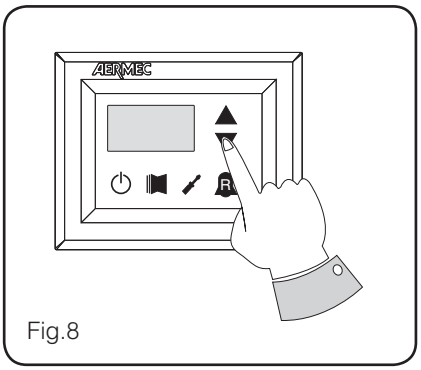


Fig.8

Setting operational parameters (user level)

Setting of operational mode (HOT/COLD)			
Index - String	**MIN value**	**MAX value**	**Parameter function**
0 StA	0	1	This parameter identifies the functioning mode set for the unit: • set value = 0 - Cooling mode; • set value = 1 - Heating mode. In cooling only units, this parameter is displayed but it cannot be modified. **In software versions prior to 3.75, to make the season change the unit must be in standby.**

Setting of cooling temperature			
Index - String	**MIN value**	**MAX value**	**Parameter function**
1 StF	-20°C	26°C	This parameter indicates the value of the work setting active in cooling mode.

Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

Parameters only visible in the models with DCP installed

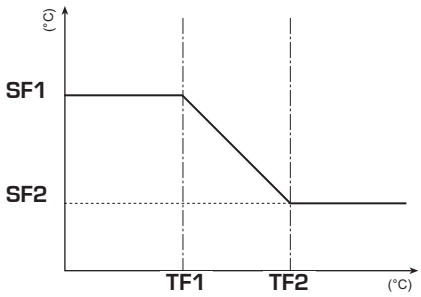
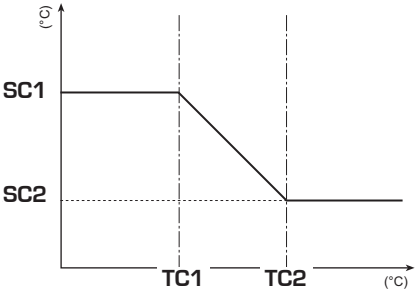
Parameters only visible in bicompressor models

Parameters only visible in the models with inverter compressor

Setting of proportional cooling band			
Index - String	**MIN value**	**MAX value**	**Parameter function**
2 bnF	1°C	20°C	This parameter indicates the proportional band applied to the cooling set; this band produces the optimised management of the compressor, only switching it on if the inlet/outlet water temperature (depending on the type of control set by parameter (O) in the installer menu) is greater than the cooling work set (parameter (1) user menu) plus the value of this parameter.

Setting of heating temperature			
Index - String	**MIN value**	**MAX value**	**Parameter function**
3 StC	25°C	(*)	This parameter indicates the value of the work setting active in heating mode. In cooling only units, this parameter is displayed but it cannot be modified. (*) the maximum limit can be configured by means of the parameter (t) of the installer menu

Setting of proportional heating band			
Index - String	**MIN value**	**MAX value**	**Parameter function**
4 bnC	1°C	20°C	This parameter indicates the proportional band applied to the heating set; this band produces the optimised management of the compressor, only switching it on if the inlet/outlet water temperature (depending on the type of control set by parameter (O) in the installer menu) is less than the heating work set (parameter (3) user menu), minus the value of this parameter. In cooling only units, this parameter is displayed but it cannot be modified.

Settings made on the basis of outside temperature				
Index - String	**MIN value**	**MAX value**	**Parameter function**	
5 CSt	0	3	This setting activates the algorithm of compensation of the work setting:	
			 **SF1**: index (6) user menu; **SF2**: index (8) user menu; **TF1**: index (7) user menu; **TF2**: index (9) user menu; **In cooling mode**, the work setting is calculated automatically on the basis of the outside temperature, following the logic highlighted in the diagram.	 **SC1**: index (A) user menu; **SC2**: index (C) user menu; **TC1**: index (B) user menu; **TC2**: index (d) user menu; **In heating mode**, the work setting is calculated automatically on the basis of the outside temperature, following the logic highlighted in the diagram.

Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

Parameters only visible in the models with DCP installed

Parameters only visible in bicompressor models

Parameters only visible in the models with inverter compressor

Setting cooling temperature setpoint 1			
Index - String	**MIN value**	**MAX value**	**Parameter function**
6 SF1	-20°C	26°C	This parameter indicates the maximum value of the cooling setting, corresponding with the minimum outside air temperature (index (7) user menu). This parameter is only visible if the compensation function has been activated (index (5) user menu).

Setting the outside air temperature 1			
Index - String	**MIN value**	**MAX value**	**Parameter function**
7 tF1	-40°C	50°C	This parameter indicates the minimum outside air temperature taken into consideration for cooling compensation. This parameter is only visible if the compensation function has been activated (index (5) user menu).

Setting cooling temperature setpoint 2			
Index - String	**MIN value**	**MAX value**	**Parameter function**
8 SF2	-20°C	26°C	This parameter indicates the minimum value of the cooling setting, corresponding with the maximum outside air temperature (index (9) user menu). This parameter is only visible if the compensation function has been activated (index (5) user menu).

Setting the outside air temperature 2			
Index - String	**MIN value**	**MAX value**	**Parameter function**
9 tF2	-40°C	50°C	This parameter indicates the maximum outside air temperature taken into consideration for cooling compensation. This parameter is only visible if the compensation function has been activated (index (5) user menu).

Setting heating set 1			
Index - String	**MIN value**	**MAX value**	**Parameter function**
A SC1	25°C	(*)	This parameter indicates the maximum value of the heating setting, corresponding with the minimum outside air temperature (index (b) user menu). This parameter is only visible if the compensation function has been activated (index (5) user menu). (*) the maximum limit can be configured by means of the parameter (t) of the installer menu

Setting the outside air temperature 1 (heating)			
Index - String	**MIN value**	**MAX value**	**Parameter function**
b tC1	-40°C	50°C	This parameter indicates the minimum outside air temperature taken into consideration for heating compensation. This parameter is only visible if the compensation function has been activated (index (5) user menu).

Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

Parameters only visible in the models with DCP installed

Parameters only visible in bicompressor models

Parameters only visible in the models with inverter compressor

Setting heating set 2			
Index - String	**MIN value**	**MAX value**	**Parameter function**
C SC2	25°C	(*)	This parameter indicates the minimum value of the heating setting, corresponding with the maximum outside air temperature (index (C) user menu). This parameter is only visible if the compensation function has been activated (index (5) user menu). (*) the maximum limit can be configured by means of the parameter (t) of the installer menu

Setting the outside air temperature 2 (heating)			
Index - String	**MIN value**	**MAX value**	**Parameter function**
d tC2	-40°C	50°C	This parameter indicates the maximum outside air temperature taken into consideration for heating compensation. This parameter is only visible if the compensation function has been activated (index (5) user menu).

Setting domestic water temperature setpoint			
Index - String	**MIN value**	**MAX value**	**Parameter function**
E SAS	25°C	(*)	The heat pumps have a work setting for producing domestic water; this setting indicates the processed water temperature beyond which the compressor stops. Remember that to visualise this setting, parameter (A) of the installer menu must be active (set value = 1). (*) the maximum limit can be configured by means of the parameter (t) of the installer menu

Setting domestic water proportional band			
Index - String	**MIN value**	**MAX value**	**Parameter function**
F bAS	1°C	20°C	This parameter indicates the proportional band applied to the hot domestic water set; this band produces the optimised management of the compressor, only switching it on if the inlet/outlet water temperature (depending on the type of control set by parameter (O) in the installer menu) is less than the hot domestic water set (parameter (E) user menu), minus the value of this parameter. In cooling only units, this parameter is displayed but it cannot be modified.

Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

Parameters only visible in the models with DCP installed

Parameters only visible in bicompressor models

Parameters only visible in the models with inverter compressor

INSTALLER menu

To access the INSTALLER menu, press the key in (Fig.9). Once the key has been pressed, you must insert the password to access the various menus; to access the user menu, the **password is 030**. To modify the value of the passwords, use the arrow keys. When you have inserted the correct password, press the key in (Fig.9). The monitor will show the index of the INSTALLER parameter and a 3-character string that identifies it; the string will be displayed for one second, after which it is replaced by the value of the parameter itself. To move on to the next parameter, use the arrow keys (Fig.10). To modify a parameter, just select it, press the key in (Fig.9), modify the assigned value using the arrow keys in (Fig.10), and confirm the modification by pressing the key in (Fig.9) again.

WARNING The following parameters must only be modified by qualified personnel authorised to install the unit.

PASSWORD = 030

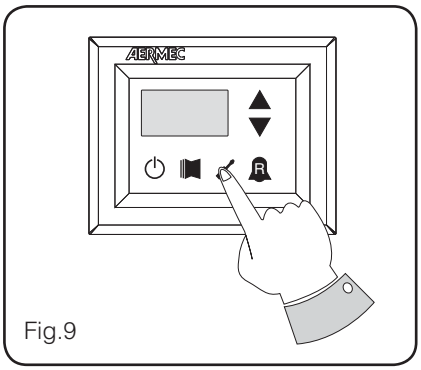


Fig.9

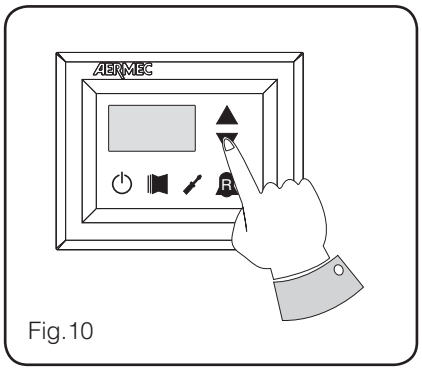


Fig.10

Setting operational parameters (installer level)

Setting of input and output regulation			
Index - String	**MIN value**	**MAX value**	**Parameter function**
0 iU	0	2	The machine adjustment will depend on the value of this parameter: • if 0, the machine adjustment is based on the output temperature; • if 1, the machine adjustment is based on the input temperature; • if 2, the machine adjustment is based on the temperature of the remote probe, as read on the DHW panel (in the event of a fault on the remote probe, the machine adjustment is based on the built-in probe, signalling this fact via alarm code 157). If the production of hot domestic water is activated, the adjustment is automatically forced on the water output temperature, regardless of the value of this parameter.

Setting cooling FORCE-OFF			
Index - String	**MIN value**	**MAX value**	**Parameter function**
1 oFF	-25°C	25°C	The units check the working temperature (input or output), to which a safety threshold is connected, and beyond which the compressor is switched off immediately and automatically; this threshold is called FORCE-OFF.

Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

Parameters only visible in the models with DCP installed

Parameters only visible in bicompressor models

Parameters only visible in the models with inverter compressor

Setting heating FORCE-OFF			
Index - String	**MIN value**	**MAX value**	**Parameter function**
2 oFC	30°C	70°C	The heat pumps check the working temperature (input or output), to which a safety threshold is connected, and beyond which the compressor is switched off immediately and automatically; this threshold is called FORCE-OFF.

Setting the safety threshold			
Index - String	**MIN value**	**MAX value**	**Parameter function**
3 SAF	0.5°C	20°C	Temperature threshold above the force-off, which reactivates the start-up of the compressor after the switching off for force-off.

Setting integral time			
Index - String	**MIN value**	**MAX value**	**Parameter function**
4 int	0 seconds	999 seconds	The units possess an advanced logic for controlling the processed water temperature; the complete check prevents the system arriving at a point of equilibrium at a higher or lower temperature compared with the one set in the work setting. **Remember that an increase in the integration time weakens the effect of the integral control.**

Setting derivation time			
Index - String	**MIN value**	**MAX value**	**Parameter function**
5 dEr	0 seconds	120 seconds	Time within which the input water temperature is checked to estimate the load on the system; if the band on the setting value is exceeded within this time, the unit will be activated.

Setting the anti-freeze threshold			
Index - String	**MIN value**	**MAX value**	**Parameter function**
6 AG	-50°C	20°C	In the units it is possible to set a threshold for the anti-freeze alarm; this value specifies at what temperature the anti-freeze alarm is activated. Remember that, to modify the anti-freeze threshold parameter, the corresponding dip-switch must be activated (see the dip-switch configuration table).

Setting frost protection			
Index - String	**MIN value**	**MAX value**	**Parameter function**
7 FrP	0	4	In the units, it is possible to set a safety control on the water output temperature; on the basis of the value assigned to this parameter, the anti-freeze electric heater is managed as follows: • value 0, anti-freeze electric heater absent; • value 1, anti-freeze electric heater installed and working only with machine in heat or cool mode; • value 2, anti-freeze electric heater installed and working also in standby, but switching on the pump; • value 3, anti-freeze electric heater working in standby without the pump being activated; • value 4, with external air temperature less than 3°C, the pump is activated for 2 minutes every 30, to monitor the temperature of the water throughout the system.

Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

Parameters only visible in the models with DCP installed

Parameters only visible in bicompressor models

Parameters only visible in the models with inverter compressor

Setting the supplementary electric heater or activating the boiler			
Index - String	**MIN value**	**MAX value**	**Parameter function**
8 r in	0	4	This parameter indicates which logic must be used to manage the supplementary electric heater; the choice of logic is determined by the value set in this parameter so, depending on the value, the settings are: 0 = no supplementary electric heater present on the unit 1 = supplementary electric heater present, but cannot be activated during hot domestic water production 2 = electric heater activation command used as consent for activation of an external boiler 3 = supplementary electric heater present and active during hot domestic water production 4 = electric heater activation command used as consent for activation of an external boiler which can also be used in supplementary mode **WARNING:** **• on the SRP V1 units, it is ABSOLUTELY FORBIDDEN to set this parameter value at (3);** **• to set the value at (4), the DHW accessory is needed.**

Panel control configuration			
Index - String	**MIN value**	**MAX value**	**Parameter function**
9 PAn	0	3	This setting configures the type of control applicable to the units; depending on the value decided for this setting, the controls on the functioning mode (HEAT/COOL) and the unit on/off command will be managed in the following way: Set value 0: • Setting functioning mode = set parameter 0 • ON/OFF control = from the panel on the machine Set value 1: • Setting functioning mode = set parameter 0 • ON/OFF control = from the remote panel Set value 2: • Setting functioning mode = set from remote contact • ON/OFF control = from the panel on the machine Set value 3: • Setting functioning mode = set from remote contact • ON/OFF control = from the remote contact

Enabling domestic water			
Index - String	**MIN value**	**MAX value**	**Parameter function**
A ASA	0	1	In the heat pump models, there is the possibility to produce hot water for domestic use; this production has its own modifiable setting and its own band (parameters E, F user menu); with this parameter you can make parameters E and F visible and usable. Remember that to guide the domestic water production request, once the function has been activated you must use digital input ID6 (marked on the electric card enclosed with the unit as **TWS**). Remember also that setting this parameter with a value of: • 1, you ENABLE the domestic water function • 0, you DISABLE the domestic water function The CLOSED status of the clamp means the domestic water function is ACTIVE. This function is available from software version 3.7 (the software version is visible as a reading, with index E). The minimum compressor functioning time, and the defrosting time, take priority over the production of domestic water. From software version 4.2, when domestic water is activated the adjustment is automatically set on the basis of the output temperature, regardless of the value of the parameter (0) in this menu.

Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

Parameters only visible in the models with DCP installed

Parameters only visible in bicompressor models

Parameters only visible in the models with inverter compressor

Power dedicated to domestic water production			
Index - String	**MIN value**	**MAX value**	**Parameter function**
b ASP	0%	100%	In those units that can produce domestic water, once this function has been activated it is possible to decide the percentage of power to use for the production. This function allows you to set a threshold to guarantee reduced energy consumption during domestic water production.

Standby time in Input/Output			
Index - String	**MIN value**	**MAX value**	**Parameter function**
C AAS	0 seconds	600 seconds	This parameter allows you to establish the standby time (in seconds) for reversing the 3-way valve inserted in the system for producing domestic water.

Standby time in Input/Output			
Index - String	**MIN value**	**MAX value**	**Parameter function**
d trA	0	3	This parameter enables the possibility to join the ID digital clamp (marked on the electric card enclosed with the unit as **TRA**) with a room thermostat on which the functioning of the compressors and supplementary electric heaters will be disabled. Remember also that setting this parameter with a value of: • 1 or 2, you ENABLE this function • 0 or 3, you DISABLE this function Remember that the OPEN status of the clamp means: • the function blocks the compressors and electric heaters if the parameter is set at 1 • the function blocks the compressors, pump and electric heaters if the parameter is set at 2 • the pump alarm (as in the previous software version), if the parameter is set at 3 Remember also that by setting this parameter at 3, the moducontrol card is compatible with the previous software version (3.6).

Enabling flow switch bypass			
Index - String	**MIN value**	**MAX value**	**Parameter function**
E bAF	0	1	In those units that produce domestic water, the flow switch alarm can be bypassed to allow the correct synchronisation between a diverting valve installed in the system, and unit functioning during the production of hot domestic water.

Time for flow switch bypass			
Index - String	**MIN value**	**MAX value**	**Parameter function**
F tbF	0 seconds	300 seconds	This parameter allows you to establish the time (in seconds) for flow switch bypass.

Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

Parameters only visible in the models with DCP installed

Parameters only visible in bicompressor models

Parameters only visible in the models with inverter compressor

High room temperature standby			
Index - String	**MIN value**	**MAX value**	**Parameter function**
	0	70	This parameter lets you establish the room temperature threshold above which the heat pump is disabled; once the threshold has been exceeded, the compressor and pump are switched off.

High temperature threshold for input water			
Index - String	**MIN value**	**MAX value**	**Parameter function**
	40	80	This parameter indicates the temperature of the input water above which the pump is switched off and a pre-alarm is generated. After the intervention of the pre-alarm, there is a waiting time of 15 minutes before the pump starts up again. After the third intervention, the machine goes into alarm/lockout. Active also with the pump switched off, and the chiller in standby. In the latter case, the alarm is generated.

Screensaver configuration			
Index - String	**MIN value**	**MAX value**	**Parameter function**
	0	2	This parameter indicates the configuration of the screensaver: • value 0, screensaver disabled; • value 1, screensaver with visualisation of the dashes (to be used with the control panels with software prior to version 1.3); • value 2, screensaver without visualisation of the dashes (to be used with the control panels with software from version 1.3 onwards).

Modbus supervisor address			
Index - String	**MIN value**	**MAX value**	**Parameter function**
	0	999	This parameter indicates the Modbus address assigned to the supervisor; this address will be used in the communication between supervisor and Moducontrol.

Supervisor baud rate			
Index - String	**MIN value**	**MAX value**	**Parameter function**
	0	2	This parameter indicates the speed of communication between supervisor and Moducontrol; this speed is set on the basis of the value selected for this parameter: 0 = 9600 bps 1 = 19200 bps 2 = 38400 bps

Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

Parameters only visible in the models with DCP installed

Parameters only visible in bicompressor models

Parameters only visible in the models with inverter compressor

Supervisor write enabled			
Index - String	**MIN value**	**MAX value**	**Parameter function**
n AS1	0	1	This parameter enables the write commands for the supervisor; this enablement is set on the basis of the value selected for this parameter: 0 = write command disabled 1 = write command enabled Remember that the read commands are always active.

Air temperature limit 1(*)			
Index - String	**MIN value**	**MAX value**	**Parameter function**
o LA1	-25°C	45°C	This parameter indicates the external air temperature at which the machine can produce its maximum water value (this value is specified in parameter P - St1).

Water temperature limit 1(*)			
Index - String	**MIN value**	**MAX value**	**Parameter function**
P St1	0°C	70°C	This parameter indicates the maximum temperature of the water produced, in line with the outside air temperature specified in parameter O - LA1.

Air temperature limit 2(*)			
Index - String	**MIN value**	**MAX value**	**Parameter function**
q LA2	-25°C	45°C	This parameter indicates the external air temperature at which the machine can produce its maximum water value (this value is specified in parameter R - St2).

Water temperature limit 2(*)			
Index - String	**MIN value**	**MAX value**	**Parameter function**
r St2	0°C	70°C	This parameter indicates the maximum temperature of the water produced, in line with the outside air temperature specified in parameter Q - LA2.

Maximum heating set point			
Index - String	**MIN value**	**MAX value**	**Parameter function**
t LSP	15°C	65°C	This parameter indicates the maximum temperature of the water produced by the unit in heat mode.

(*) these parameters describe the operating limits (in heat mode) of the compressor, beyond which it is automatically switched off and, when necessary, heat operation is guaranteed by the supplementary electric heater;

- Parameters only visible in heat pump models
- Parameters only visible in models set for hot domestic water production
- Parameters only visible in the models with DCP installed
- Parameters only visible in bicompressor models
- Parameters only visible in the models with inverter compressor

INSTALLER 2 menu

To access the INSTALLER_2 menu, follow the same procedure described for the INSTALLER menu; the only difference is the value of the password, which is 31.

WARNING The following parameters must only be modified by qualified personnel authorised to install the unit.

PASSWORD = 031

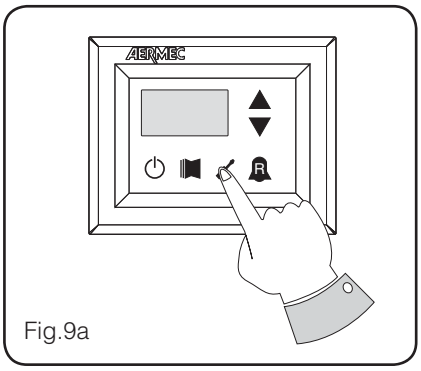


Fig.9a

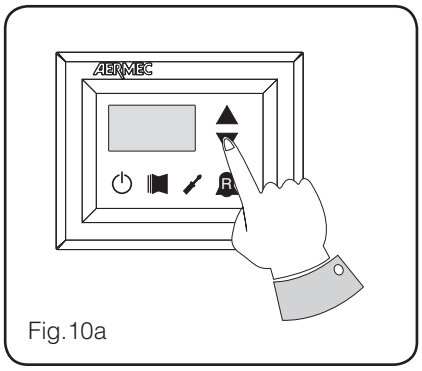


Fig.10a

Setting operational parameters (installer level)

Threshold for reactivation after shutdown force off			
Index - String	**MIN value**	**MAX value**	**Parameter function**
0	0 °C	30 °C	If the parameter value rin = 4 (parameter 8 of the Installer menu), then this is a probe storage system, this parameter indicates how much lower the threshold of force off so as to prevent the compressor is reactivated after the intervention of ForceOff dynamic extinguished soon after.

Configuration of the heating cable (ANK only)			
Index - String	**MIN value**	**MAX value**	**Parameter function**
1	0	2	Setting the output to which the heating cable is connected: 0- no heating cable 1- heating cable on the CPA output (the parameter (0) of the menu with password=72 "according to CP must be 0" 2- heating cable on the VGC output if not used (the configuration of the dip switches must be: DIP1 = ON, DIP2=ON, DIP5=ON, DIP8=OFF, DIP9=OFF)

Heating cable setpoint (ANK only)			
Index - String	**MIN value**	**MAX value**	**Parameter function**
2	-20 °C	10 °C	Heating cable activated with an external air temperature lower than the value of this parameter. Heating cable deactivated with an external air temperature higher than the value of this parameter, plus 1.0° hysteresis.

Thermostat pump switch-off			
3	0	1	0 = the pump continues to function when the set point temperature is reached. 1 = the pump switches off when the set point temperature is reached (when this option is selected, the adjustment is automatically activated on the basis of the input temperature). This parameter is only visible with the adjustment on the basis of the input temperature (parameter (0) =1 or 2).

Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

Parameters only visible in the models with DCP installed

Parameters only visible in bicompressor models

Parameters only visible in the models with inverter compressor

Managing the electric heater

The units with moducontrol offer the possibility to manage an electric heater; this heater can be managed in different ways:

• supplementary (the simultaneous use of the heat pump and the electric heater);

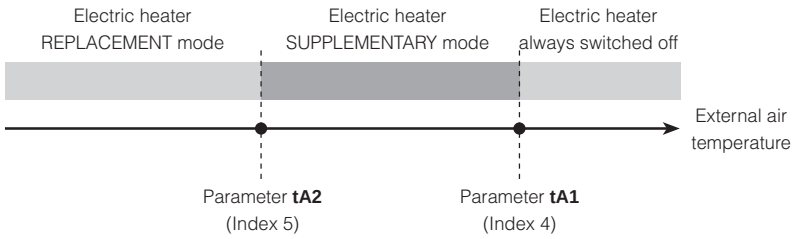
• anti-freeze, or replacement (the heat pump compressor is switched off and the electric heater alone is activated);

The operational specifications of both modes are shown in the diagrams below.

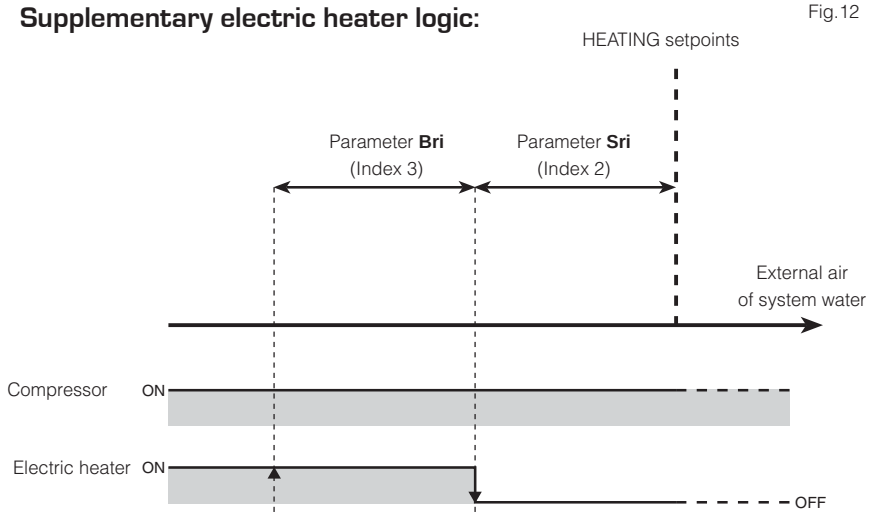
The choice of supplementary or replacement mode depends on the external air temperature, and in case this falls below the threshold indicated in the relative diagram.

WARNING: all parameters referred to in the chart alongside are contained in the electric heater menu, shown on the next pages.

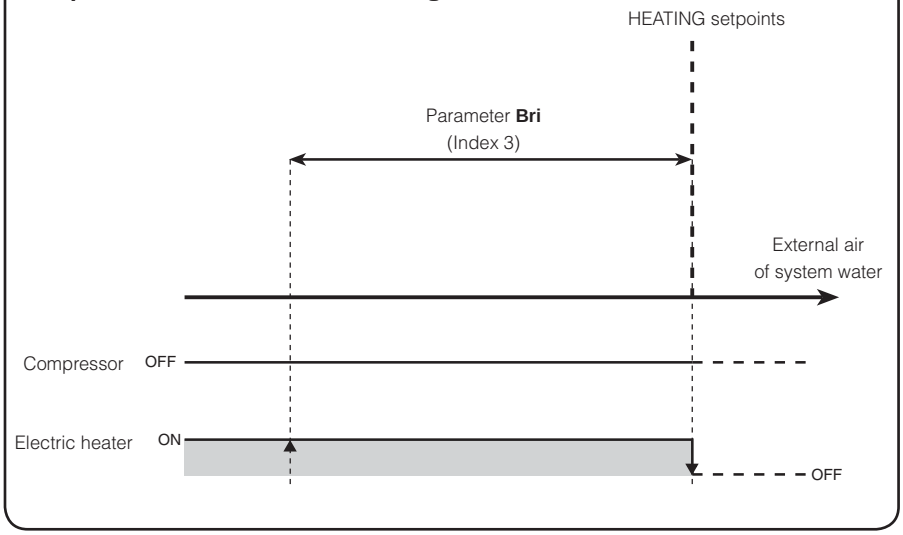
Selection logic for electric heater management mode Fig.11



Supplementary electric heater logic: Fig.12



Replacement electric heater logic: Fig.13



ELECTRIC HEATER menu

To access the ELECTRIC HEATER menu, press the key in (Fig.14). Once the key has been pressed, you must insert the password to access the various menus; to access the user menu, the **password is 001**. To modify the value of the passwords, use the arrow keys. When you have inserted the correct password, press the key in (Fig.14). The monitor will show the index of the ELECTRIC HEATER parameter and a 3-character string that identifies it; the string will be displayed for one second, after which it is replaced by the value of the parameter itself. To move on to the next parameter, use the arrow keys (Fig.15). To modify a parameter, just select it, press the key in (Fig.14), modify the assigned value using the arrow keys in (Fig.15), and confirm the modification by pressing the key in (Fig.14) again.

WARNING The following parameters must only be modified by qualified personnel authorised to install the unit.

PASSWORD = 001

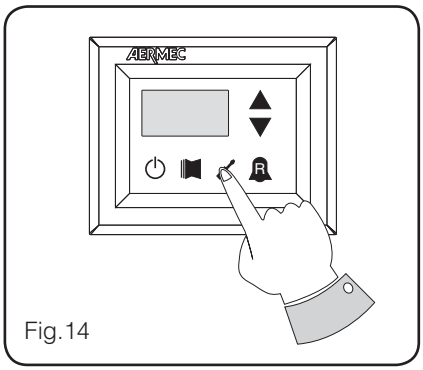


Fig.14

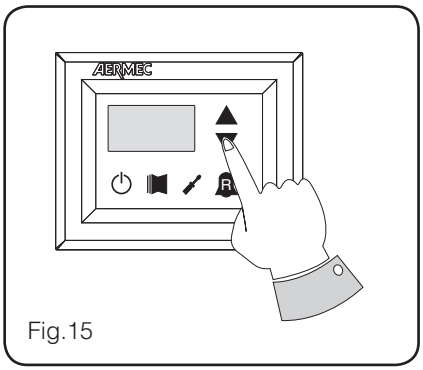


Fig.15

Setting operational parameters (electric heater level)

Setting anti-freeze electric heater setpoints			
Index - String	**MIN value**	**MAX value**	**Parameter function**
0 SrA	-20°C	50°C	The units offer the possibility to set a threshold for the activation of the anti-freeze electric heater; if the temperature read by one of the two water sensors (input or output, depending on the type of check enabled) reaches the value set in this parameter, the anti-freeze electric heater is activated.

Setting anti-freeze electric heater band			
Index - String	**MIN value**	**MAX value**	**Parameter function**
1 brA	0.3°C	10°C	The units offer the possibility to set a threshold for the activation of the anti-freeze electric heater; if the temperature read by one of the two water sensors (input or output, depending on the type of check enabled) reaches the value set in this parameter, the anti-freeze electric heater is activated.

Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

Parameters only visible in the models with DCP installed

Parameters only visible in bicompressor models

Parameters only visible in the models with inverter compressor

Setting supplementary electric heater setpoint			
Index - String	**MIN value**	**MAX value**	**Parameter function**
2 Sri	0°C	65°C	This parameter indicates the deviation from the heating setpoint, for switching off the electric heater (if active) in supplementary mode; as shown in Fig.12 on the previous page (Parameter Sri).

Setting electric heater band in supplementary/replacement mode			
Index - String	**MIN value**	**MAX value**	**Parameter function**
3 bri	0°C	20°C	In supplementary mode, the temperature of the water in the system is checked before the unit is switched on. If the temperature is less than/equal to the value calculated for the switch-on band, the electric heater will be switched on and will operate as per the diagram on the previous page Fig.12. The value of the switch-on band is calculated as follows: switch-on band = (Heating setpoint) - (Parameter Sri) - (Parameter Bri); see Fig.12 on previous page; In replacement mode, this parameter represents the band of deviation from the heating setpoint, within which the heater will be activated or deactivated, as shown on the previous page Fig.13.

Setting outside air temperature threshold for supplementary mode			
Index - String	**MIN value**	**MAX value**	**Parameter function**
4 tA1	-40°C	50°C	This parameter indicates the outside air temperature threshold, beneath which the heater is activated in supplementary mode; as shown on the previous page, in Fig.11 Parameter tA1.

Setting outside air temperature threshold for replacement mode			
Index - String	**MIN value**	**MAX value**	**Parameter function**
5 tA2	-40°C	50°C	This parameter indicates the outside air temperature threshold, beneath which the heater is activated in replacement mode; as shown on the previous page, in [Fig.A] Parameter tA2.

Setting the band for air temperature			
Index - String	**MIN value**	**MAX value**	**Parameter function**
6 bA	0°C	20°C	This parameter indicates the band applied to the air temperature setpoints (tA1-tA2).

Parameters only visible in heat pump models

Parameters only visible in models set for hot domestic water production

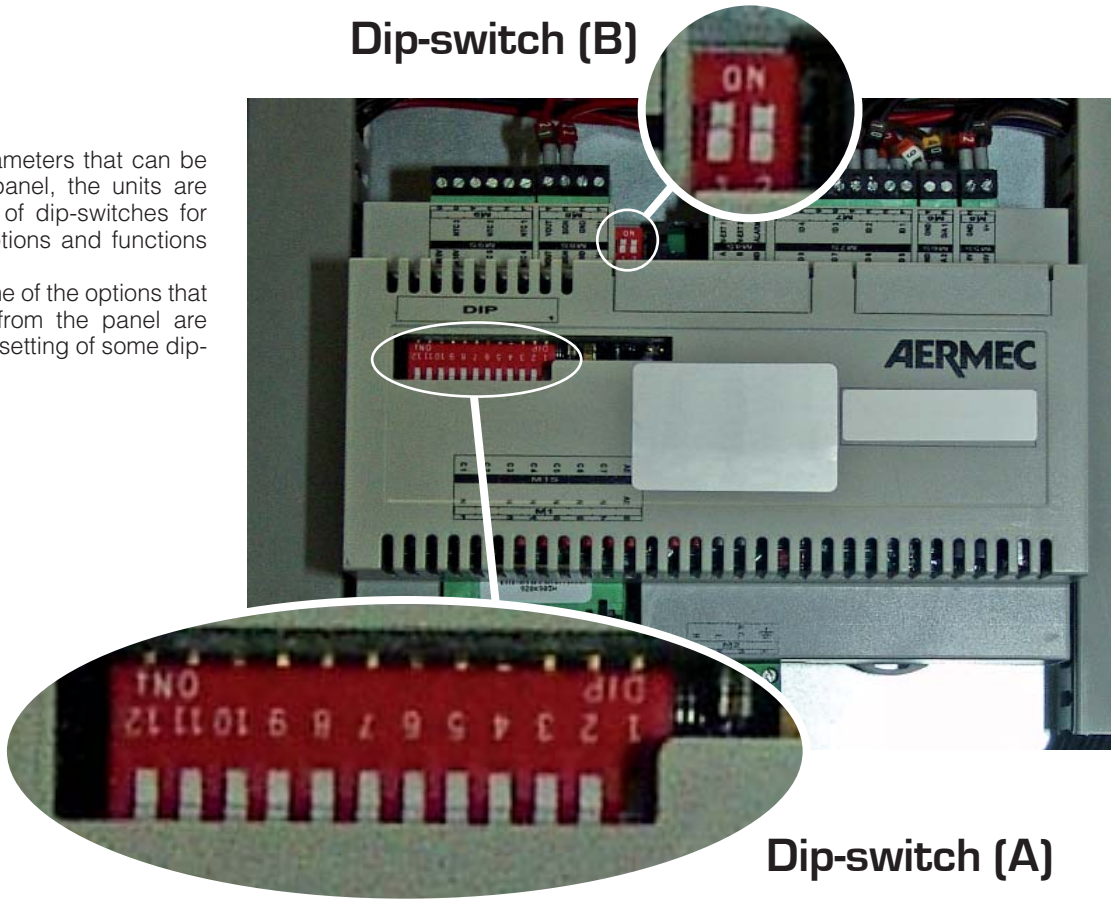
Parameters only visible in the models with DCP installed

Parameters only visible in bicompressor models

Parameters only visible in the models with inverter compressor

Table of DIP-SWITCH configuration

Apart from the parameters that can be inserted from the panel, the units are fitted with a series of dip-switches for managing some options and functions of the machine.
Remember that some of the options that can be managed from the panel are bound to a specific setting of some dip-switches.



Default setting of MODUCONTROL DIP-SWITCH														
Heat recovery unit	DIP-SWITCH (A)												DIP-SWITCH (B)	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
ANL	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	–	–	OFF	OFF
ANL H	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	–	–	OFF	OFF
ANL C	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	–	–	OFF	OFF
ANL A/Q	ON	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	–	–	OFF	OFF
ANL HA/HQ	ON	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	–	–	OFF	OFF
ANL Z/Y	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	–	–	OFF	OFF
ANLI H	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	–	–	ON	OFF
ANR H	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	–	–	OFF	OFF
ANR HA/HK	ON	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	–	–	OFF	OFF
ANR HP	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	–	–	OFF	OFF
ANF H	ON	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	–	–	OFF	OFF
ANF HA/HK/HJ	ON	ON	OFF	ON	ON	ON	OFF	ON	OFF	OFF	–	–	OFF	OFF
ANF HP	ON	ON	OFF	OFF	ON	OFF	ON	ON	OFF	OFF	–	–	OFF	OFF
ANK	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	–	–	OFF	OFF
ANK Z/Y	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	–	–	OFF	OFF
ANK A	ON	ON	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	–	–	OFF	OFF
SRP	ON	ON	OFF	ON	ON	OFF	OFF	ON	OFF	OFF	–	–	OFF	OFF

Dip-switch	No. dip	Status	Function
A	1	ON	Machine set as heat pump
		OFF	Machine set for cooling only
	2	ON	Defrosting only by cycle reversal
		OFF	Defrosting by hot gas injection
	3	ON	Glycol water: anti-freeze setting can be modified
		OFF	Anti-freeze setting (parameter B) blocked
	4	ON	Output control deactivated
		OFF	Output control activated
	5	ON	Safety capacity controls deactivated
		OFF	Safety capacity controls activated
	6	ON	Algorithm for check of low water content deactivated
		OFF	Algorithm for check of low water content activated
	7	ON	Condensation pressure control device present (accessory DCP)
		OFF	Condensation pressure control device absent (accessory DCP)
	8	ON	Configuration of the card for ANR unit (R407C)
		OFF	Configuration of the card for ANL unit (R410A)
	9	ON	Configuration of the card for inverter unit
		OFF	Configuration of the card for ON/OFF chiller unit
	10	ON	Configuration of the card for condenser unit
		OFF	Configuration of the card for chiller unit
	11	ON	Not used
		OFF	Not used
	12	ON	Not used
		OFF	Not used

Dip-switch	Dip combinations		Function
	DIP 1	DIP 2	
B	OFF	OFF	Factory settings
	ON	OFF	Factory settings
	ON	ON	Factory settings
	OFF	ON	Factory settings

Serial communication protocol

The Modu_control card allows an interface with a centralised system via a special serial expansion card based on the RS485 electric standard and using the Modbus RTU standard protocol.
The Modu_Control card is always the slave of the communication.

To enable communication from a supervision system to the Moducontrol card, you must set the following parameters:
- Parametro J - Ad1 (Indirizzo modbus del supervisore);
- Parametro L - Bd1 (Baudrate supervisore);

It is also necessary to ensure compliance with the following characteristics:
- Stop bits: 2;
- Parity: NONE;

MODBUS commands

The Modu_Control card manages (towards the BMS/VMF supervisor) both the Register values (whole/analogue) and the Coil values (digital). The commands that can be used to read/write these values are:

Codici MODBUS utilizzati	
cmd	**descrizione**
0x01	Read Coil Status
0x03	Read Holding Registers
0x05	Force Single Coil
0x06	Preset Single Register
0x0F	Preset Multiple Coils
0x10	Preset Multiple Registers

DIGITAL VALUES LIST (COIL):

COMANDI DIGITALI DISPONIBILI
Read Coil Status
Force Single Coil
Force Multiple Coils

To be able to write the COIL parameters on the Modu_Control card, you must enable the supervision commands by setting the parameter parameter (N) = 1 of the installer menu (password=30) of the panel on the machine.

ADDRESS	DESCRIPTION
0	Standby/On command (toggle) 0=OFF 1=ON
1	Operation mode command (toggle) 0=COOL 1=HEAT
2	Domestic water remote command 0=Normal, 1=Domestic
3	Enable remote thermostat 0=Disabled, 1=Enabled
4	Alarm reset command 1=Alarm reset
5	Compressor1 status 0=OFF 1=ON
6	Compressor2 status 0=OFF 1=ON
7	Boiler/electric heater status 0=OFF 1=ON
8	Hot domestic water production status 0=not active 1=active
9	Domestic water ID status 0=ID closed – 1=ID open
10	Remote ON_OFF ID status 0=ID closed – 1=ID open
11	Season ID status 0=ID closed (cool), 1=ID open (heat)
12	Room thermostat ID status 0=ID closed – 1=ID open
13	Alarm summary
14	Pre-alarm summary
15	Compressor thermomagnetic switch pre-alarm
16	Fan thermomagnetic switch pre-alarm

ADDRESS	DESCRIPTION
17	High pressure switch pre-alarm
18	Flow switch/differential pressure switch (water) pre-alarm
19	Low pressure switch pre-alarm
20	Pre-alarm for absence of NTC1 input probe (SIW)
21	Pre-alarm for absence of NTC2 input probe (SUW)
22	Anti-freeze pre-alarm
23	Pre-alarm for absence of NTC4 input probe (SGP)
24	Pre-alarm for high discharge gas temperature
25	Pre-alarm for absence of compressor delivery transducer
26	High pressure pre-alarm
27	Pre-alarm for absence of NTC3 input probe (SS)
28	Pre-alarm for absence of suction transducer
29	Low pressure pre-alarm
30	Low output pre-alarm
31	Pump thermomagnetic switch pre-alarm
32	High pressure capacity control pre-alarm
33	Low pressure capacity control pre-alarm
34	Discharge temperature capacity control pre-alarm
35	Bemf error pre-alarm (longertek inverter)
36	Pre-alarm for internal communication error (longertek)
37	Overcurrent pre-alarm (longertek)
38	Pre-alarm for absence of load (longertek)
39	Pre-alarm for incorrect voltage (longertek)
40	Pre-alarm for start-up error (longertek)
41	Pre-alarm for IPM protection error (longertek)
42	Pre-alarm for EEPROM error (longertek)
43	Pre-alarm for compressor stalling (longertek)
44	Pre-alarm for absence of communication (longertek)
45	PFC module pre-alarm (longertek)
46	Pre-alarm for cooling over-temperature (APY)
47	Pre-alarm for overcurrent in acceleration (APY)
48	Pre-alarm for overcurrent at steady speed (APY)
49	Pre-alarm for overcurrent in deceleration (APY)
50	Pre-alarm for undervoltage on BUS DC (APY)
51	Pre-alarm for overvoltage on BUS DC (APY)
52	NOT USED
53	NOT USED
54	Pre-alarm for converter PFC fault (APY)
55	Pre-alarm for overcurrent in acceleration (APY)
56	Overload pre-alarm (APY)
57	Pre-alarm for overcurrent at steady speed (APY)
58	Pre-alarm for overcurrent in deceleration (APY)
59	Pre-alarm for incorrectly connected compressor (APY)
60	Pre-alarm for absence of communication (APY)
61	Pre-alarm for cooling fin temperature sensor error (APY)
62	NOT USED
63	NOT USED

ADDRESS	DESCRIPTION
64	NOT USED
65	Fault condition pre-alarm (APY)
66	NOT USED
67	NOT USED
68	Reverse cycle valve pre-alarm
69	Pre-alarm for high water inlet temperature
70	Pre-alarm for reverse cycle due to high discharge gas temperature
71	NOT USED
72	NOT USED
73	NOT USED
74	NOT USED
75	NOT USED
76	NOT USED
77	NOT USED
78	NOT USED
79	NOT USED
80	NOT USED
81	NOT USED
82	NOT USED
83	NOT USED
84	NOT USED
85	Compressor thermomagnetic switch alarm
86	Fan thermomagnetic switch alarm
87	High pressure switch alarm
88	Flow switch/differential pressure switch (water) alarm
89	Low pressure switch alarm
90	Alarm for absence of NTC1 input probe (SIW)
91	Alarm for absence of NTC2 input probe (SUW)
92	Anti-freeze alarm
93	Alarm for absence of NTC4 input probe (SGP)
94	Alarm for high discharge gas temperature
95	Alarm for absence of compressor delivery transducer
96	High pressure alarm
97	Alarm for absence of NTC3 input probe (SS)
98	Alarm for absence of suction transducer
99	Low pressure alarm
100	Low output alarm
101	Pump thermomagnetic switch alarm
102	High pressure capacity control alarm
103	Low pressure capacity control alarm
104	Discharge temperature capacity control alarm
105	Bemf error alarm (longertek inverter)
106	Alarm for internal communication error (longertek)
107	Overcurrent alarm (longertek)
108	Alarm for absence of load (longertek)
109	Alarm for incorrect voltage (longertek)
110	Alarm for start-up error (longertek)

ADDRESS	DESCRIPTION
111	Alarm for IPM protection error (longertek)
112	Alarm for EEPROM error (longertek)
113	Alarm for compressor stalling (longertek)
114	Alarm for absence of communication (longertek)
115	PFC module alarm (longertek)
116	Alarm for cooling over-temperature (APY)
117	Alarm for overcurrent in acceleration (APY)
118	Alarm for overcurrent at steady speed (APY)
119	Alarm for overcurrent in deceleration (APY)
120	Alarm for undervoltage on BUS DC (APY)
121	Overvoltage alarm (APY)
122	NOT USED
123	NOT USED
124	Alarm for converter PFC fault (APY)
125	Alarm for overcurrent in acceleration (APY)
126	Overload alarm (APY)
127	Alarm for overcurrent at steady speed (APY)
128	Alarm for overcurrent in deceleration (APY)
129	Alarm for incorrectly connected compressor (APY)
130	Alarm for absence of communication (APY)
131	Alarm for cooling fin temperature sensor error (APY)
132	NOT USED
133	NOT USED
134	NOT USED
135	Fault condition alarm (APY)
136	NOT USED
137	NOT USED
138	Alarm for faulty reverse cycle valve
139	Alarm for high water inlet temperature
140	Alarm for reverse cycle due to high discharge gas temperature
141	(Code 57) Alarm remote reading of the probe within DHW
142	(Code 58) Alarm reading of temperature sensor outside air
143	NOT USED
144	NOT USED
145	NOT USED
146	NOT USED
147	NOT USED
148	NOT USED
149	NOT USED
150	NOT USED
151	NOT USED
152	NOT USED
153	NOT USED
154	NOT USED

READ LIST REGISTER:

COMANDI LETTURA DISPONIBILI
Read Holding Register

ADDRESS	DESCRIPTION
0	Type of machine: 0 – ANL,1 – ANLI, 2 – ANR/ANF/SRP, 3 – ANL-C
1	Type of inverter machine 0=longertek 1=APY
2	NTC1 input (TUA) (SIW)
3	NTC2 input (TIA) (SUW)
4	NTC3 input (TSB) (SS)
5	NTC4 input (TGP) (SGP)
6	NTC5 input (TAE) (SAE)
7	High pressure transducer input (AP) (TAP)
8	Low pressure transducer input (BP) (TBP)
9	0-10V dd input
10	Relay digital output status
11	Safety band on force OFF
12	Time until compressor start-up/switch-off
13	Hours of primary compressor operation (in thousands)
14	Hours of primary compressor operation
15	Number of peaks made by the compressor (in thousands)
16	Number of peaks made by the compressor
17	Major sw version
18	Minor sw version
19	Machine adjustment setpoint (including corrections)
20	Condensation control pressure setpoint
21	Pressure differential for condensation control
22	Hours of auxiliary compressor operation (in thousands)
23	Hours of auxiliary compressor operation
24	Number of peaks made by the auxiliary compressor (in thousands)
25	Number of peaks made by the auxiliary compressor
26	Power supplied by the machine (chiller ON-OFF) Use frequency (chiller inverter)
27	Compressor pressure drop during suction
28	Power requested from the inverter control
29	Dip-switch configuration (0x0000 = all OFF - 0xOFF = all ON)
30	ON_OFF command enablement status Season from panel or remote panel
31	Enablement status for room thermostat connected to ID3 input
32	Machine operation status: 0 - Chiller Off, 1 - Chiller On, 2 – Capacity control injection, 3 – Defrosting for injection, 4 – Defrosting for reverse cycle
33	Electric heater/boiler accessory: 0=absent 1=electric heater 2=boiler
34	Inverter current APY
35	Inverter output voltage APY
36	Inverter BUS voltage APY
37	Inverter cooling fin temperature APY
38	Limit set point hot

WRITE LIST REGISTER:

COMANDI SCRITTURA DISPONIBILI
Preset Single Register
Preset Multiple Registers

ADDRESS	DESCRIPTION	MIN-MAX LIMITS
39	Cooling setpoint	-200 - 260 [°C]
40	Cooling setpoint band	10 - 200 [°C]
41	Heating setpoint	250 - 650 [°C]
42	Heating setpoint band	10 - 200 [°C]
43	Setpoint correction	0 - 3
44	Cooling setpoint 1	-200 - 260 [°C]
45	External AT in cool mode 1	400 - 500 [°C]
46	Cooling setpoint 2	-200 - 260 [°C]
47	External AT in cool mode 2	-400 - 500 [°C]
48	Heating setpoint 1	250 - 650 [°C]
49	External AT in heat mode 1	-400 - 500 [°C]
50	Heating setpoint 2	250 - 650 [°C]
51	External AT in heat mode 2	-400 - 500 [°C]
52	Domestic water setpoint	-250 - 650 [°C]
53	Domestic water band	10 - 200 [°C]
54	Power percentage requested from the thermostat	0 - 100 [%]
55	PWD_SET_VMF	-32768 - 32767
56	Remote probe DHW	-32768 ÷ 32767

LIST OF EXCEPTIONS:

The error codes highlighted by the Modu Control card are shown below:

EXCEPTION	DESCRIPTION
	The requested function code is not managed by the card.
	The data request contains a reference to an address that is not available on the card.
	The data write request contains a value that is out of range, so writing is not allowed.

Recapitulatory table of alarms

The units have two types of malfunctioning warning:
• pre-alarm
• alarm
The first type is indicated by the flashing of the red indicator light on the display; by pressing the bell key, you can display the alarm list (with index and cause shown in the table below). A pre-alarm remains such for 60 seconds; if the condition that caused it does not disappear within this time, it becomes an alarm. The alarms are visualised in the same way as the pre-alarms, apart from the fact that the fixed red indicator light comes on. Before resetting the unit, you are advised to contact the After Sales Assistance. To reset the unit you must switch it off then on again, using the standby button.

WARNING
The pre-alarms can become alarms if:
• a period of time equal to, or longer than, 60 seconds passes in the pre-alarm condition
• the maximum number of pre-alarms in an hour (five) is exceeded. In this case, each subsequent pre-alarm will be visualised directly as an alarm, and as such will cause the machine to stop until its cause is eliminated.

Pre-alarm index	Alarm index	Cause	Notes
1	101	Compressor thermomagnetic switch Fan thermomagnetic switch Pump thermomagnetic switch	This warning appears if the contact of the thermomagnetic switch protecting the MTC compressor is opened.
2	102	Fan thermomagnetic switch	This warning appears if the contact of the thermomagnetic switch protecting the MTV fan is opened. This code is displayed only if the card is used as a replacement for cards with SW up to version 3.6.
3	103	High pressure switch	This warning does NOT indicate the status of the high pressure switch itself, but of the compressor contactor. The high pressure switch acts directly on the compressor contactor. If the card controls the switch-on of the compressor, and the contactor is not activated after 3 seconds, this signal appears. This alarm can also be caused by a defect in the functioning of the transmission system relay from the compressor contactor to the card (indicated as RAP in the wiring diagrams). If the contactor is deactivated while the compressor is functioning, this warning reappears. AP.
4	104	Flow switch Water differential pressure switch	This warning appears with the opening of the contact relating to the flow switch or to the differential pressure switch. This alarm is not detected in the first 40 seconds from when the pump is switched on. The machine goes into lockout when the maximum number of flow switch interventions allowed is exceeded. If frost protection mode (and therefore the pump too) is activated in standby, the flow switch status is also controlled. FL/PD.
5	105	Low pressure switch	This warning appears with the opening of the contact of the low pressure switch (intake on the compressor) BP.
6	106	No water inlet probe	This warning appears when the water inlet probe is disconnected.
7	107	No water outlet probe	This warning appears when the water outlet probe is disconnected.
8	108	Water freeze	This warning appears when the anti-freeze temperature threshold (installer menu, parameter (6) default: 3°C) of the outlet water is reached. The pre-alarm condition is removed when the outlet water temperature exceeds the setpoint calculated by the card on the basis of an internal algorithm; the anti-freeze alarm is suspended (in heat mode) for 3 seconds from when the compressor is switched on.
9	109	No force probe	This warning appears when the force gas probe is not detected.

10	110	High force gas temperature	This warning appears when the force gas temperature (SGP probe) exceeds the threshold set in the parameter. The pre-alarm condition is removed with the factory-set temperature (default 125°C).
11	111	No compressor delivery pressure transducer	This warning appears when the compressor delivery transducer is not detected and the machine is set in heat pump mode, or the presence of the DCP is set.
12	112	High pressure	This warning appears when the transducer detects a delivery pressure greater than the set threshold (default: 40 bar). The pre-alarm condition is removed with the factory-set pressure (default: 38 bar).
13	113	No defrosting probe	This warning appears when the defrosting probe is absent and the machine is set in heat pump mode.
14	114	No compressor suction pressure transducer	This warning appears when the compressor suction transducer is absent and the machine is set in heat pump mode.
15	115	Low pressure	This warning appears when the compressor delivery transducer detects a suction pressure lower than the factory-set threshold in cool mode (default: 4 bar), or in heat mode (default : 2 bar). The pre-alarm condition is removed when the suction pressure exceeds the envisaged intervention threshold (default equal to 2 bar). The low pressure alarm is suspended in heat mode for 3 seconds from when the compressor is switched on; it is permanently suspended during cycle reverse.
16	-	Low output	Whenever the machine is powered, the control checks the behaviour of the compressor once only, via the output control procedure. This control can be deactivated by means of the dip-switch.
17	117	Pump thermomagnetic switch	This warning appears if the contact of the thermomagnetic switch protecting the pump is opened. MTP. This code is displayed only if the card is used as a replacement for cards with SW up to version 3.6.
18	118	High pressure capacity control	This warning appears whenever there is a capacity control due to the set threshold being reached. The machine goes into lockout when the maximum number of capacity controls allowed (default 5) is exceeded. With the inverter machine, it also indicates a capacity control due to a high compression ratio.
19	119	Low pressure capacity control	This warning appears whenever there is a low pressure capacity control. The machine goes into lockout when the maximum number of capacity controls allowed (default 5) is exceeded.
20	120	Discharge temperature capacity control	This warning appears whenever there is a discharge temperature capacity control. The machine goes into lockout when the maximum number of capacity controls allowed (default 5) is exceeded.
21	121	Bemf error (chiller inverter) - error in the detection of the back emf	This error is given by the inverter control card and is linked to compressor pickup current problems.
22	122	Internal communication error	The inverter control card has internal communication problems.
23	123	Overcurrent	Excessive current absorption by the compressor.
24	124	No charge	The compressor does not absorb enough current and may operate empty.
25	125	Incorrect voltage	The inverter control card indicates an incorrect BUS voltage.
26	126	Start-up error	The inverter control card indicates the incorrect start-up of the PMSM motor.
27	127	IPM protection error	Error on the IGBT.
28	128	EEPROM error	Eeprom error on the inverter control card.
29	129	Compressor stalling	
30	130	No communication	The inverter control card does not respond; it may not be powered, or the serial cable may be disconnected, or the A and B signals may be inverted.
31	131	PFC module	Error in the PFC inverter module.

32	132	Excessive temperature of cooling blade	
33	133	Overcurrent in acceleration	Hardware error.
34	134	Overcurrent at constant speed	Hardware error.
35	135	Overcurrent in deceleration	Hardware error.
36	136	Undervoltage on BUS DC	
37	137	Overvoltage on BUS DC	
40	140	PFC Converter Fault Error in the PFC module	Software error.
41	141	Overcurrent in acceleration	Software error.
42	142	Overload	
43	143	Overcurrent at constant speed	Software error.
44	144	Overcurrent in deceleration	Software error.
45	145	Compressor not connected correctly	
46	146	No communication	
47	147	Error in cooling blade temperature sensor	
51	151	Irregular condition.	Frequency reduced by overcurrent or overtemperature protection.
54	154	Faulty reverse cycle valve	The reverse cycle valve could be faulty or blocked.
55	155	Input water high temperature	The input water temperature has exceeded the value of installer menu parameter (H). There is probably a boiler in the same system. With the third pre-alarm intervention, the machine goes into lockout.
–	156	Cycle reverse due to high temperature of discharge gas.	This pre-alarm indicates the intervention of a defrosting cycle due to cycle reverse, without respecting the cycle reverse times. The cycle reverse was prompted by the capacity control threshold being exceeded due to the high temperature of the discharge gas (default 130°). This pre-alarm does not cause the compressor to stop, and there is no maximum number of interventions.
57	157	Read error of the remote probe of the DHW panel.	This pre-alarm indicates a fault in the remote probe, or a problem in communication with the DHW panel. The alarm is only active if parameter (8)=4 in the menu with password = 30.
58	158	Read error of the outside air temperature probe.	This pre-alarm indicates a fault in the outside air temperature probe when the DCP is present, or when the machine is a heat pump.

WARNING

Remember that the pre-alarms are reset automatically, but the alarms must be reset manually.

From software version 3.9.0, the alarms can be reset by means of the remote ON/OFF contact, if this is enabled.
From the ON position, move to OFF then back to ON within 5 seconds to reset the alarms; a maximum of 3 resets can be made each hour via the ON/OFF contact.
You must first reset the alarms using the "R" button.
In the event of a lack of voltage, the alarms will be reset.

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MODUCONTROL

NUMÉRO DE SÉRIE	

DÉCLARATION DE CONFORMITÉ CE

Les signataires de la présente déclarent sous leur entière responsabilité que l'équipement défini comme suit :

NOM **MODUCONTROL**

TYPE **Carte électronique pour groupe d'eau glacée AIR/EAU, pompe à chaleur**

Auquel cette déclaration fait référence, est conforme aux normes harmonisées suivantes :

CEI EN 60730-1	Norme de sécurité
CEI EN 61000-6-1 **CEI EN 61000-6-3**	Immunité et émission électromagnétique pour le milieu résidentiel.
CEI EN 61000-6-2 **CEI EN 61000-6-4**	Immunité et émission électromagnétique pour le milieu industriel.

Satisfaisant ainsi aux conditions essentielles des directives suivantes :

- Directive LVD : 2006/95/CE

- Directive Compatibilité électromagnétique 2004/108/CE

Bevilacqua **15/01/2008**

Directeur commercial
Signature

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