GENERAL CHARACTERISTICS

INPUTS

● **5 analogical inputs** for temperature measuring **in range - 50 ÷ +99.9ºC**

3 for the first circuit: - No1. Water input for circuit 1. Operating Temperature Controller. HEATING – COOLING.
- No2. Water output. Safety Temperature Controller No1. Resistance No1.
- No3. defrost controlling C1.

2 for the second circuit: - No4. Water output for circuit 2. Safety Temperature Controller No2. Resistance No2.
- No5. defrost controlling C2.

● **11 digital inputs**

7 for the first circuit: - No1. Input No1. System's ON – OFF.
- No2. Input No2. HEAT – COOL.
- No3. Input No3. HP1.
- No4. Input No4. LP1
- No5. Input No5. C1.
- No6. Input No6. GA1.
- No7. Input No7. FLOW SWITCH.

4 for the second circuit: - No8.   Input No8. HP2.
- No9.   Input No9. LP2.
- No10. Input No10. C2.
- No11. Input No11. GA2.

OUTPUTS

In total MACON has 9 outputs

● **outputs** to relay 250VAC 5A, pump relay, compressor C1, valve 1, resistance 1, ALARM
● **output** for driving external fan micro relay of the circuit 1 **(FAN 1)**.
● **4 outputs** for driving second compressor **C2**, second valve **V2**, second resistance **R2** and the second fan **FAN2** external micro relays.

CONNECTION WITH REMOTE CONTROL

The device can connect to Remote Control with four wires. The Remote Control indicates to the display and also execute via keyboard, exactly the same operations as the main device. Can connect in range 500 meters. The connection diagram is displayed in picture 1, page 2.
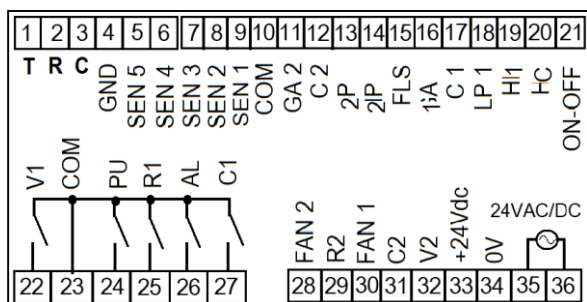
PARAMETERS

The parameters are divided in two groups: - **main** parameters in total 60.
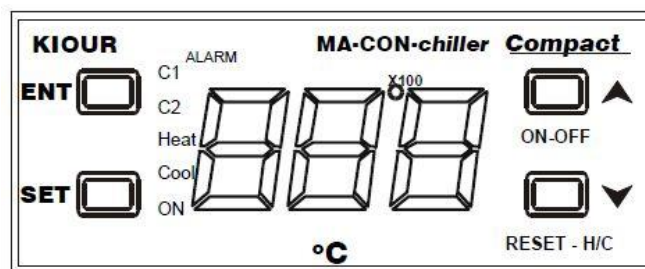- **secondary** parameters in total 8.
Two of the main parameters and all secondary parameters are readily accessible. The others must use access code. The parameters menu structure is displayed in relevant table.

CONNECTION

CONNECTION DIAGRAM   **FRONT PANEL**

TECHNICAL SPECIFICATIONS

● Power supply: 24VAC/DC
● Connection with wiring of 0.25mm²
● 5 relays 250VAC 3A Resistive Load
● 4 outputs for external relays 30mA
● Operating temperature: -15 ÷ +55°C

● Storage temperature: -20 ÷ +80°C
● The device is mounted through panel hole 29x71mm
● Power supply safety switch: 1A
● Maximum power 5Watt

CONNECTION FOR SYSTEM 1 – PICTURE 1

- **Wires 9 & 4. Input No1. Temperature Sensor No1.** Water input for circuit 1. Operating Temperature Controller. HEATING – COOLING.
- **Wires 8 & 2. Input No2. Temperature Sensor No2.** Water output. Safety Temperature Controller No1. Resistance No1.
- **Wires 7 & 3. Input No3. Temperature Sensor No3.** defrost controlling C1.
- **Wires 6 & 4. Input No4. Temperature Sensor No4.** Water output for circuit 2. Safety Temperature Controller No2. Resistance No2.
- **Wires 5 & 5. Input No5. Temperature Sensor No5**. defrost controlling C2.

<table>
<tr><td colspan="2"><u>CIRCUIT No1</u></td><td colspan="2"><u>CIRCUIT No2</u></td></tr>
<tr><td>Wire No21. Input No1. System's ON-OFF.</td><td></td><td>Wire No14. Input No8. HP2.</td></tr>
<tr><td>Wire No20. Input No2. HEAT - COOL.</td><td></td><td>Wire No13. Input No9. LP2.</td></tr>
<tr><td>Wire No19. Input No3. HP1.</td><td></td><td>Wire No12. Input No10. C2.</td></tr>
<tr><td>Wire No18. Input No4. LP1.</td><td></td><td>Wire No11. Input No11. GA2.</td></tr>
<tr><td>Wire No17. Input No5. C1.</td></tr>
<tr><td>Wire No16. Input No6. GA1.</td></tr>
<tr><td>Wire No15. Input No7. FLOW SWITCH.</td><td></td><td>* The system operates properly with closed contacts *</td></tr>
</table>
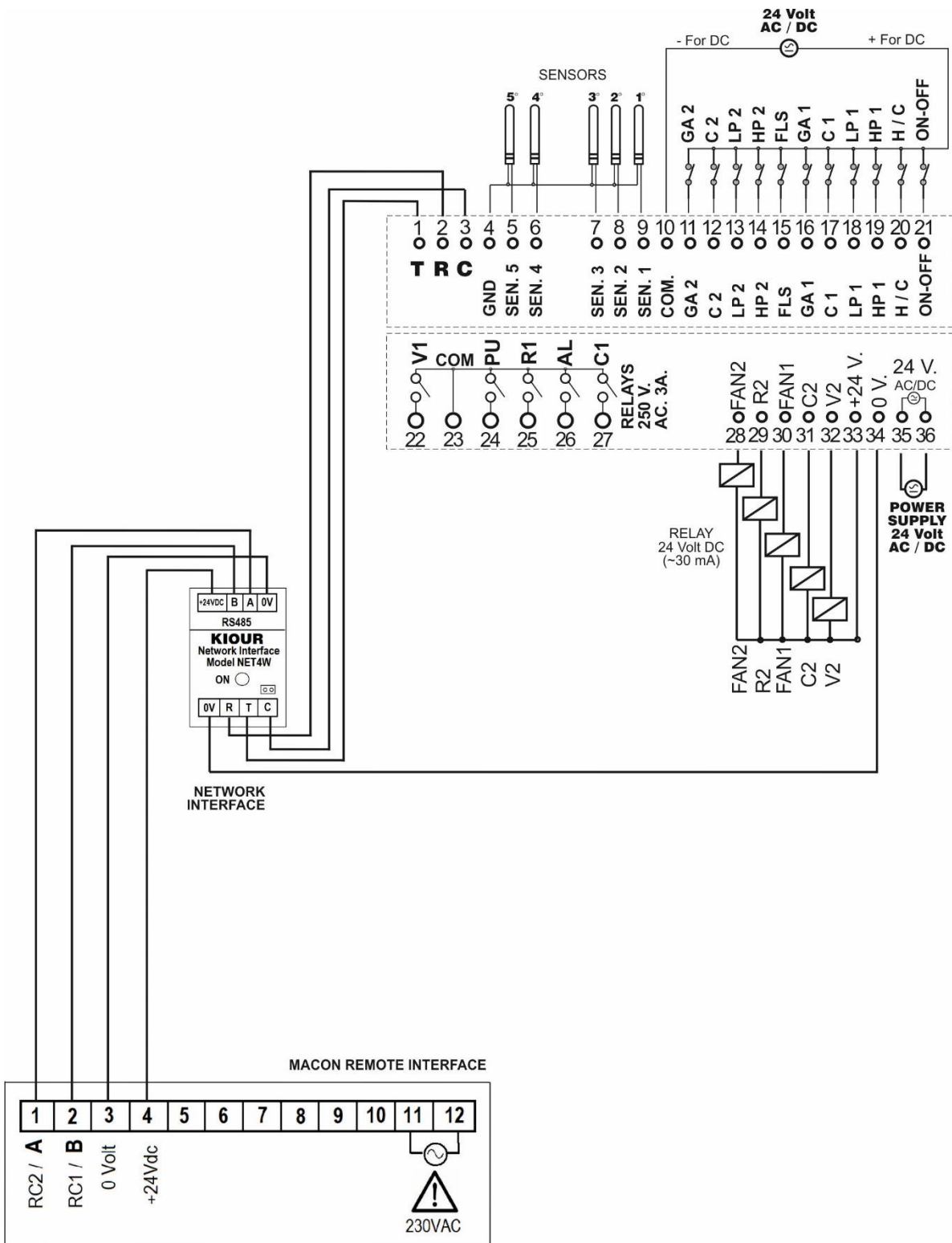
DEVICE HANDLING

Up arrow: By pressing the button [▲] for **4 sec** do the device ON – OFF. If the Remote Control is activated or the parameters are under programming, then this operation is canceled.

Down arrow: By pressing the button [▼] for **4 sec** changes successively the state operation to **Cooling, Heating, Standby**. If the Remote Control is activated or the parameters are under programming, then this operation is canceled. If there is Heating – Cooling control from Remote Control, then there is no Standby position.

Down arrow: RESET which can operate when the parameters are under programming.

PROGRAMMING THE PARAMETERS

1. By pressing the button [**ENT**] we access the parameter's menu and the first parameter **SCo** is displayed. By pressing the arrows [▲], [▼] we scroll into the parameters as they appear in the following parameter's table.
2. By pressing [**SET**] the value of the parameter is displayed and with the [▲], [▼] we change the value. By pressing [**ENT**] we **confirm** the new value and the parameter's name is displayed. By pressing [**SET**] we **cancel** the new value and the parameter's name is displayed.
3. By pressing [**ENT**] we exit parameter's menu.

 ATTENTION! For safety reasons aren't displayed all parameters. Must put the number **22** in **Cod** parameter if we want to have access in all parameters.

INDICATION AND ZERO ADJUSTMENT FOR OPERATION HOURS

1. By pressing [**ENT**] the first parameter **SCo** is displayed. By pressing up arrow [▲] the **H 2** is displayed and that means **H 2 = operation hours of compressor 2.** By pressing again up arrow [▲] the **H 1** is displayed and that means **H 1 = operation hours of compressor 1.** By pressing another one time up arrow [▲] the **H P = operation hours of pump** is displayed.
2. By pressing [**SET**] the operation hours are displayed and by pressing at the same time both [▲] and [▼] the operation hours can be reset. Then by pressing [**ENT**] we can confirm the reset.

INDICATION OF TEMPERATURE CHANNELS

After **H P** parameter by pressing up arrow [▲] **t 5, t 4, . . . till t1** parameters are displayed successively. By pressing [**SET**] the temperature of corresponding sensor (5, 4, 3, 2, 1) is displayed.

DESCRIPTION OF BUTTONS OPERATION

ENTER [**ENT**] : - Access to parameters menu
 - Exit from parameters
 - Confirmation to the new value of parameter and exit from the value parameter.

SET [**SET**] : - Access to parameters values
 - Cancelation of new parameters values and exit from the value parameter.

UP arrow [▲] : - Systems **ON – OFF**
 - Scrolling into parameters menu
 - Increasing the parameter's value

Down arrow [▼] : - Change the mode to Cooling – Heating – Standby
 - Scrolling into parameters menu
 - Decreasing the parameter's value

LED OPERATION

ON **:** - The system is activated
C1 **:** - When the first compressor **C1** is operating then led is **ON**. When the led is **flashing** the compressor has the demand to be ON but it waits until time has elapsed.

C2 **:** - When the second compressor **C 2** is operating then led is **ON**. When the led is **flashing** the compressor has the demand to be ON but it waits until time haw elapsed.

COOL **:** - This led is **ON** when system is in Cool mode
HEAT **:** - The led is **ON** when system is in Heat mode
ALARM **:** - When there is an ALARM then the led is **flashing**
UP UNITS DISPLAY DOT : - Operation compressor hours **X 100**

TABLE 1

No	PARAMETERS	DESCRIPTION	
A1	t 1	Temperature of sensor N 1 (Input)	
A2	t 2	Temperature of sensor N 2 (Water exit 1)	
A3	t 3	Temperature of sensor N 3 (deFrost C1)	
A4	t 4	Temperature of sensor N 4 (Water exit 2)	
A5	t 5	Temperature of sensor N 5 (deFrost C2)	
A6	H P	Pump's operation hours	**Operation Hours:** When the right up dot (led) of units display is ON then the operation hours are multiply by 100 **(X 100).** To RESET operations hours must press at the same time the buttons [▲], [▼] and after must press [**ENT**].
A7	H 1	Compressor's 1 operation hours	
A8	H 2	Compressor's 2 operation hours	
1	SCo	Temperature operation controller for Cooling. **Values range from LCL till LCH**	
2	SHt	Temperature operation controller for Heating. **Values range from LHL till LHH**	
3	Cod	Access Code: with number **22** can have access to the rest parameters	
4	diS	Choose what channel want to be displayed on screen device. For ex. **1 = channel 1** etc.	
5	LCL	Low temperature limit of Cooling SET POINT	
6	LCH	Upper temperature limit of Cooling SET POINT	
7	LHL	Low temperature limit of Heating SET POINT	
8	LHH	Upper temperature limit of Heating SET POINT	
9	FoP	**FUN OPERATION MODE** Value: **0 =** Funs are always OFF **1 =** Funs are ON when: the device is ON and there is Cooling or Heating choice. If there is not Cooling or Heating choice then the fans are OFF. **2 =** Fun is open when the corresponding compressor operates properly. **3 =** Funs operate based on SET POINTS, in Cooling **FCS** and in Heating **FSH**. They are ON when the temperature of temperature deFrost sensor instruct Fun to be open (just in normal operation **NOT** in deFrost operation).	
10	FSC	Temperature SET POINT of fun operation in Cooling mode. It operates when the parameter **FoP = 3.**	
11	FSH	Temperature SET POINT of fun operation in Heating mode. It operates when the parameter **FoP = 3.**	
12	doP	Defrost operation: when **0 =** NO defrost, and **1 =** defrost mode	
13	dtO	**0 :** deFrost finishes after the time which is set from parameter **dt3**. **1 :** deFrost finishes when the temperature is equal on ending deFrost temperature. If meanwhile the **dt3** time is over before it reaches the ending deFrost temperature, then the deFrost process stops and on the screen displayed a **dF** message for some seconds.	
14	dbE	**Starting Temperature of deFrost** When the temperature is lower than **dBE** limit for continuous period of time which is bigger than **dt1** time and the compressor is already ON, then the deFrost process starts.	
15	dEn	**Ending Temperature of deFrost** With parameter set to **dto = 1** the deFrost stops when it reaches desirable temperature in less time than it is the deFrost duration.	
16	dFa	Temperature above which makes ON the fun in deFrost process.	
17	dt1	Period of time in which must there are, all the time, the deFrost conditions in order to start deFrost process. **Values from 10 till 200. Where 1 unit = 10sec.**	
18	dt2	Minimum duration time of deFrost. **Values from 10 till 200. Where 1 unit = 10sec.**	
19	dt3	Maximum duration time of defrost. **Values from 1 till 200 minutes**	
20	dt4	Minimum time between starting of the same circuit. **Values from 1 till 200 minutes.**	
21	dt5	Minimum time between starting of both circuits. **Values from 1 till 200 minutes.**	
22	ASP	Antifreeze ALARM SET POIN, Safety Temperature Controller	
23	ArE	Antifreeze Heater SET POINT, Resistance	
24	Adi	Differential of Safety Thermostat	
25	Adr	Differential of Resistance Thermostat	
26	SE2	Activation of temperature sensor No2. For **0 = OFF, 1 = ON.**	
27	SE3	Activation of temperature sensor No3. For **0 = OFF, 1 = ON.**	
28	SE4	Activation of temperature sensor No4. For **0 = OFF, 1 = ON.**	
29	SE5	Activation of temperature sensor No5. For **0 = OFF, 1 = ON.**	

TABLE 1

No	PARAMETERS	DESCRIPTION
30	AJ1	Zero adjustment for temperature sensor No1. **Values range – 5.0 ÷ + 10.0°C**
31	AJ2	Zero adjustment for temperature sensor No2. **Values range – 5.0 ÷ + 10.0°C**
32	AJ3	Zero adjustment for temperature sensor No3. **Values range – 5.0 ÷ + 10.0°C**
33	AJ4	Zero adjustment for temperature sensor No4. **Values range – 5.0 ÷ + 10.0°C**
34	AJ5	Zero adjustment for temperature sensor No5. **Values range – 5.0 ÷ + 10.0°C**
35	rCo	Differential SET POINT for Cooling. **Values range 0.1 ÷ + 20.0°C**
36	rHt	Differential SET POINT for Heating. **Values range 0.1 ÷ + 20.0°C**
37	rS2	Differential for **second** SET POINT. **Values range 0.1 ÷ + 20.0°C** If the parameter **GSP=1** then the **second** compressor operates: In **Cooling** mode: SET POINT of second compressor = operation SET POINT + the value of **rS2** parameter. In **Heating** mode: SET POINT of second compressor = operation SET POINT – the value of **rS2** parameter.
38	tPC	**Pump – Compressor** time. Compressor start time after the Pump. **Values range 0 – 200 seconds.**
39	tCP	**Compressor – Pump** time. Time delay to turn OFF the Pump after the OFF of the compressor. **Values range 0 – 200 minutes.**
40	tF1	Bypass time of **FLOW SWITCH** in the pump's starting. **Values range 0 – 200 seconds.**
41	tF2	Bypass time of **FLOW SWITCH** during the operation time. **Values range 0 – 200 seconds.**
42	Too	Time between ON and ON of the same compressor. **Values range 0 – 200 where 1 unit = 10 seconds**
43	tFo	Time between OFF and ON of the same compressor. **Values range 0 – 200 where 1 unit = 10 seconds**
44	tdC	Time between ON and ON between the two compressors. **Values range 0 – 200 where 1 unit = 10 seconds**
45	tFC	Time between OFF and OFF between the two compressors. **Values range 0 – 200 where 1 unit = 10 seconds**
46	ton	Minimum operation time of compressor. **Values range 0 – 200 seconds.**
47	tLP	Bypass time of compressor's low pressure **(LP1)** when starting. **Values range 0 – 200 seconds.**
48	tAF	Bypass time of safety thermostat when starting.
49	Gnc	Number of compressors. **Values: 1 = one compressor, 2 = two compressors.**
50	Grc	ON – OFF Remote Control of the whole system. **Values: 0 = OFF, 1 = ON**
51	GrH	Remote Control with choice **HEAT – COOL** of the whole system. **Values: 0 = OFF, 1 = ON.**
52	GSP	**Compressors' mode selection with one SET POINT or with two SET POINT.** **Values: 0 =** one SET POINT **1 =** two SET POINT
53	GAL	**ALARM MODE, automatic or manual** **Values: 0 =** With Manual Reset done the ALARMS: HP1, LP1, Safety Thermostat 1, FLOW SWITCH, HP2, LP2, and Safety Thermostat 2. **1 =** Auto Reset.
54	GSu	**Parameter Valve for reversal** **Values: 0 =** In cooling mode the valves' relays are OFF and in the heating mode are ON. **1 =** In heating mode the valves' relays are OFF and in the cooling mode are ON.
55	GFr	Out of order
56	GLE	Out of order
57	GPo	Compressors' starting time in POWER UP
58	GLC	**Values: 0=** gives priority to the compressor with less operating hours **1=** steer firmly on the first compressor(C1) **2=** steer firmly on the second compressor(C2)
59	GFP	**Pump operation with the ALARM of safety thermostat when the machine is in OFF mode.** **0 = The pump is out of order.** The command to relay with safety thermostat is activated. **1 = The pump operates normally** and also the command to relay with safety thermostat is activated.
60	Add	**0 =** Remote Control is deactivated **1 =** Remote Control operates normally.

TABLE 2

No	ALARM	DESCRIPTION
1	HP1	**HIGH PRESSURE ALARM C1:** It stops the compressor's **(C1)** operation After choosing the parameter for **MANUAL RESET** then the RESET is manual.
2	LP1	**LOW PRESSURE ALARM C1:** It stops the compressor's **(C1)** operation After choosing the parameter for **MANUAL RESET** then the RESET is manual.
3	C1	**ALARM COMPRESSOR C1:** It stops the compressor's **(C1)** operation The RESET is automatic. The alarm is automatically deactivated when the cause of the alarm disappears.
4	GA1	**GENERAL ALARM CIRCUIT 1:** It stops the compressor's **(C1)** operation The RESET is always automatic. The malfunction and the ALARM are deactivated.
5	FLS	**FLOW SWITCH ALARM:** Alarm from the FLOW SWITCH After choosing the parameter for **MANUAL RESET** then the RESET is manual.
6	HP2	**HIGH PRESSURE ALARM C2:** It stops the compressor's **(C2)** operation After choosing the parameter for **MANUAL RESET** then the RESET is manual.
7	LP2	**LOW PRESSURE ALARM C1:** It stops the compressor's **(C2)** operation After choosing the parameter for **MANUAL RESET** then the RESET is manual.
8	C2	**ALARM COMPRESSOR C2:** It stops the compressor's **(C2)** operation The RESET is automatic. The alarm is automatically deactivated when the cause of the alarm disappears.
9	GA2	**GENERAL ALARM CIRCUIT 2:** It stops the compressor's **(C2)** operation The RESET is always automatic. The malfunction and the ALARM are deactivated.
10	Ar1	**SENSOR 1 ALARM:** ALARM of analogical input No 1. Operation Thermostat. (Water Input). The temperature sensor has malfunction. The RESET is always automatic. The malfunction and the ALARM are deactivated.
11	Ar2	**SENSOR 2 ALARM:** ALARM of analogical input No 2. Safety Thermostat. (Water Output). Circuit 1. The temperature sensor has malfunction. The RESET is always automatic. The malfunction and the ALARM are deactivated.
12	Ar3	**SENSOR 3 ALARM:** ALARM of analogical input No 3. deFROST. The temperature sensor has malfunction. The RESET is always automatic. The malfunction and the ALARM are deactivated.
13	Ar4	**SENSOR 4 ALARM:** ALARM of analogical input No 4. Safety Thermostat. (Water Output). Circuit 2. The temperature sensor has malfunction. The RESET is always automatic. The malfunction and the ALARM are deactivated.
14	Ar5	**SENSOR 5 ALARM:** ALARM of analogical input No 5. deFROST. The temperature sensor has malfunction. The RESET is always automatic. The malfunction and the ALARM are deactivated.
15	At1	**FROST ALARM:** ALARM from Safety Thermostat Circuit 1. In compressor's starting thermostat is deactivated based on the value of **Abt** parameter in seconds. After choosing the parameter for **MANUAL RESET** then the RESET is manual.
16	At2	**FROST ALARM:** ALARM from Safety Thermostat Circuit 2. In compressor's starting thermostat is deactivated based on the value of **Abt** parameter in seconds. After choosing the parameter for **MANUAL RESET** then the RESET is manual.
		THE ALARMS ARE NOT ACTIVATED WHEN THE SYSTEM IS OFF

Made in Greece.

ATTENTION according to safety standards, the device must be properly positioned and protected from any contact with electrical parts. All parts that provide protection must be fastened in such a way that they cannot be removed without the use of tools. **ATTENTION**: disconnect the power supply of the device before proceeding to any kind of maintenance. **ATTENTION**: do not place the device near heat sources, equipment containing strong magnets, in areas affected by direct sunlight or rain. **ATTENTION:** prevent electrostatic discharges at the side slots of the device and sharp objects from been inserted. **ATTENTION:** separate the signal's cables from the power supply's cables to prevent electromagnetic disorders. Signal cables must never be in the same pipe with the power supply cables. **Use the device only as described in this document, not to use itself as a security device. The device must be disposed of in accordance with local standards for the collection of electrical and electronic equipment. Read and keep these instructions.** The device is under two year's guarantee of good operation. The guarantee is valid only if the manual instructions have been applied. The control and service of the device must be done by an authorized technician. The guarantee covers only the replacement or the service of the device.

KIOUR preserves the right to adjust its products without further notice.