Control device CHILLER / heat pump for 1 or 2 circuits with 2 or 4 compressors, with analog outputs 0-10 Volt in compressors and fans.
Models: MACON_HP (panel), MACON_HPR (rail) (1st circuit) and MACON_HPB (rail), (2nd circuit) **V.2.7.0**

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DESCRIPTION

MACON_HP controller is suitable for controlling a chiller / heat pump for 1 or 2 circuits. Available in 28x70mm box or in 70mm rail box. The second circuit (**MACON_HPB**) is available in a 70mm rail box and is connected to the main unit via three cables.

MACON_HP (1st circuit) has the following specifications:	**MACON_HPB (2nd circuit) has the following specifications**:
3 analog inputs for measuring temperature with **range -50 ÷ +150°C**	**2 analog inputs** for measuring temperature with **range -50 ÷ +150°C**
1 analog high pressure input (HP1) 4-20 mA for transmitter	**1 analog high pressure input (HP1) 4-20 mA for transmitter**
SENsor 1. Water input circuit 1. Operation thermostat HEATING - COOLING	SENsor 4. Water output 2nd circuit. Safety thermostat No2. Resistance No2.
SENsor 2. Water output. Safety thermostat No1. Resistance No1	SENsor 5. Defrost C2 control (2nd circuit).
SENsor 3. Defrost control C1 (Compressor 1st)	
6 digital inputs:	**3 digital outputs**:
1st input → Terminal block 15. ON-OFF device from a remote switch	7th input → Terminal block 23 HP2. High pressure 2nd circuit
2nd input → Terminal block 16 HEAT-COOL from a remote switch	8th input → Terminal block 22 LP2. Low pressure 2nd circuit
3rd input → Terminal block 17 HP1. High pressure 1st circuit	9th input → Terminal block 21 C2. Thermal of 2nd circuit compressor
4th input → Terminal block 18 LP1. Low pressure 1st circuit	
5th input → Terminal block 19 C1. Thermal of 1st circuit compressor	
6th input → Terminal block 20 FLOW SWITCH.	
7 relay outputs 250VAC 5Amp: pump relay, compressor **C1**, valve **V1**, resistance **R1**, fan **FAN 1**, alarm, compressor **C1b** Tadem or capacitive.	**5 relay outputs** 250VAC 5Amp: compressor relay **C2,** valve **V2,** resistance **R2,** fan **FAN 2,** compressor **C2b** Tadem or capacitive**.**
2 analog outputs 0-10 Volt. → **Compressor C1** (Terminal blocks 25, 28), and for the fan **FAN1** (Terminal blocks 25, 27).	**2 analog output 0-10 Volt** → **Compressor C2** (Terminal blocks 7, 8) and for the fan **FAN2** (Terminal blocks 6, 8).

CONNECT TO NETWORK

The device can connect to a PC via network RS485 or to a Remote Control via four cables.

- Connect to a PC: CAMIN software can monitor all temperatures, compressors relays, alarms, parameters, while sending SMS and emails in case of an alarm. More than 250 devices can connect to this network.
- Connect to a Remote Control device: it displays on screen whatever is displayed on the main device and it has full access from the keyboard to the main device. It can be installed up to 500 meters away from the main device.

PARAMETERS

Parameters are separated in two groups: 125 main parameters and 16 secondary parameters (A1-A16). Two of the main and 16 of the secondary parameters are easy accessible. For the rest we have to enter in the parameter Cod = 22 to have access to all the parameters. Check relevant table on page 2.

TECHNICAL SPECIFICATIONS

Power supply: 24 VAC/DC 50/60 Hz 10W
Connection with terminal blocks 28-16 AWG 1.5 mm^2
7 relays 250VAC 5A/3A Resistive Load in MACON_HP
5 relays 250VAC 5A Resistive Load in MACON_HPB
Operation temperature: -10 ÷ +50 °C
Storage temperature: -20 ÷ +80 °C
MACON_HP is mounted on a panel / Dimensions 28x70x75mm
MACON_HPB is mounted on a Ω rail / Dimensions 70x90x65mm
It is suggested using a safety switch 1A (not included)
Maximum consumption for each device 10 Watt

⏻ ON/OFF DEVICE

Press ▲ for 4 seconds to toggle the device between **ON/OFF** state if the parameter is set to **Grc=0.**
If ON-OFF input No 15 is activated or if the parameters are under programming, this function is canceled.

HEATING – COOLING OPERATION

Press ▼ for 4 seconds to toggle the operation between heating and cooling or cooling and heating mode if parameter is set to **GrH=0.**
If the input No 16 Heating-Cooling is activated or the parameters are under programming, (the operation with down arrow ▼) is cancelled.

deFrost

Pressing the SET button for 5 sec starts deFrost on both circuits. The display shows the message dF1 and dF2 every 2 sec, for a fraction of a second, which means that circuits 1 and 2 do deFrost.

RESET ALARMS

Pressing ▼ to reset the alarms: this feature is active even during programming the parameters.

PROGRAMMING PARAMETERS

Press ↵ to **enter (**or **exit)** the parameters menu.
The first parameter "**SCo"** is displayed and with the ▲, ▼ we scroll into the parameters menu, as presented to the parameters table.
Press **SET** to **display** the parameters value and adjust it with the ▲, ▼.
Press ↵ to **confirm** the new value and display the parameters name.
Press **SET** to **cancel** the new value and revert to the parameters name.
NOTE: for safety reasons all parameters as presented to the parameters table are not displayed. We must enter parameter Cod=22 to access full parameters menu.

DISPLAY AND RESET OPERATION HOUR OF COMPRESSORS

Press ↵ to display the first parameter **SCo**. By pressing up arrow button ▲ parameters from A16 to A1 are displayed. From A10-A14 are the operating hours of compressors and pump. When the parameter name is displayed, for eg. **h P** and press **SET** the pump operating hours are displayed and by pressing simultaneously ▲ + ▼ resets the hours. Then, press ↵ to **confirm** the nihilism. When the operating hours indicator flashes, it means that the hours are multiply by 100.

DISPLAY TEMPERATURES and 4-20 mA

Parameters from A1 to A9: by pressing **SET** displays the temperature of the corresponding sensor or 4-20 mA as described in the parameter table.

LED OPERATION

ON The system is activated.
C1 ON when the compressor **C1** operates. When it starts blinking then the compressor is set to ON but a timer is active and waits to elapsed.
C1b ON when the compressor **C1b** operates. When it starts blinking then the compressor is set to ON but a timer is active and waits to elapsed.
C2 ON when the compressor **C2** operates. When it starts blinking then the compressor is set to ON but a timer is active and waits to elapsed.
C2b ON when the compressor **C2b** operates. When it starts blinking then the compressor is set to ON but a timer is active and waits to elapsed.
C Cool – indication that system operates in Cooling mode.
H Heat – indication that system operated in Heating mode.
⚠ Blinks if an alarm is active.

RESET TO FACTORY DEFAULT SETTINGS

Enter the parameter **Cod = 31** and press twice the enter button ↵ in order to enter the factory values of the parameters (see in the following table the column default values).

TABLE 1

No	PARAMETERS	DESCRIPTION		min	max	DEFAULT	UoM.
A1	**t1**	Temperature sensor No 1 (Input)		-	-	-	°C
A2	**t2**	Temperature sensor No 2 (Water output 1)		-	-	-	°C
A3	**t3**	Temperature sensor No 3 (deFrost C1)		-	-	-	°C
A4	**HP1**	High pressure, circuit 1. HP1		-	-	-	pressure
A5	**LP1**	out of order		-	-	-	pressure
A6	**t4**	Temperature sensor No 4 (Water output 2)		-	-	-	°C
A7	**t5**	Temperature sensor No 5 (deFrost C2)		-	-	-	°C
A8	**HP2**	High pressure, circuit 2. HP2		-	-	-	pressure
A9	**LP2**	out of order		-	-	-	pressure
A10	**h P**	Pump operation hours	**Operation hours:** When the symbol **x100** is ON, the operation hours are x100. To reset the timer, press simultaneously ▲ + ▼ and then ↵.	-	-	-	hours
A11	**h 1**	Compressor C1 operation hours		-	-	-	hours
A12	**h1b**	Compressor C1b operation hours		-	-	-	hours
A13	**h2**	Compressor C2 operation hours		-	-	-	hours
A14	**h2b**	Compressor C2b operation hours		-	-	-	hours
A15	**Hs1**	out of order		-	-	-	-
A16	**Hs2**	out of order		-	-	-	-
1	**SCo**	SET POINT of compressor in Cooling mode		**LCL**	**LCH**	10	°C
2	**SHt**	SET POINT of compressor in Heating mode		**LHL**	**LHH**	20	°C
3	**Cod**	Access code: with **Cod=22** we access all the following parameters		0	255	0	-
4	**diS**	Adjust which sensor is displayed on screen, where 1 = sensor 1, etc.		1	5	1	-
5	**rCo**	Differential of SET POINT in Cooling mode		0.1	25	1,0	°C
6	**rHt**	Differential of SET POINT in Heating mode		0.1	25	1,0	°C
7	**rS2**	***Differential of the second SET POINT*** The differential is divided into 4 parts. E.g. for **rS2 = 4** and **SCo = 10**. In the 1st circuit the 1st ON at 10°C the second ON at 11°C (TADEM). The 3rd of the 2nd circuit, ON at 12°C and the 4th ON at 13°C (TADEM). In circuits with a compressor / circuit, the 1st of the 1st ON circuit at 10°C and the 2nd of the 2nd ON circuit at 12°C.		0.1	25,0	2,0	°C
8	**LCL**	minimum temperature limit of SCo in Cooling mode		-50	150	-10,0	°C
9	**LCH**	maximum temperature limit of SCo in Cooling mode		-50	150	40,0	°C
10	**LHL**	minimum temperature limit of SHt in Heating mode		-50	150	10,0	°C
11	**LHH**	maximum temperature limit of SHt in Heating mode		-50	150	60,0	°C
12	**FoP**	***Fan operation*** Value: **0 =** Fans are always OFF **1 =** Fans are ON when the device is ON. **2 =** Fan is ON when the corresponding compressor is ON **3 =** The fans operate on the basis of SET POINT. **FSC** in cooling and **FSH** in heating. The fan is controlled by the defrost temperature/pressure. The fan is ON when the temperature / pressure of the defrost sensor commands the fan to ON (in normal operation and not in defrost process). When the compressor is OFF then the fan is OFF. See also ,**parameter C12**		0	3	1	units
13	**FSC**	SET POINT of fan in Cooling mode. Operates when parameter **FoP=3.** The differential is constant equal to 1,0 °C. It's operate with temperatures T3 , T5.		-50	150	15,7	°C
14	**FSH**	SET POINT of fan in Heating mode. Operates when parameter **FoP=3**. The differential is constant equal to 1,0 °C. It's operate with temperatures T3 , T5.		-50	150	15,7	°C
15	**doP**	Defrost operation, where: **0 =** defrost operation is deactivated **1 =** defrost operation is activated. During deFrost process, **LP1** and **LP2** ALARMS are disabled.		0	1	1	units
16	**dto**	**0 =** defrost ends based only on parameter timer **dt3** **1 =** defrost ends when the temperature reaches temperature end deFrost. In the meantime, if timer **dt3** elapses before reaches temperature end deFrost , then defrost ends and an indication **dF** appears on screen for a few seconds.		0	1	1	units

No	PARAMETERS	DESCRIPTION	min	max	DEFAULT	UoM
17	**dbE**	***Temperature starting defrost*** When the temperature is below the **dbE** limit continuously for a time longer than the **dt1** time and with the compressor ON, then a defrost process starts. With the parameter **t3E = 1** it works as a SET POINT for safety thermostat of the temperatures **SEn3**, **SEn5**	-50	150	3.6	°C
18	**dEn**	***Temperature ending defrost*** With the parameter **dto = 1** the defrost ends when it reaches this temperature in less than the maximum duration of the defrost. With the parameter **t3E = 1** it functions as a differential (differential = **dEn - dbE**) safety thermostat of the temperature **SEn3**, **SEn5**	-50	150	15.6	°C
19	**dFA**	Over this temperature, the **fan** is ON during defrost. Differential is 1 °C.	-50	150	16.4	°C
20	**dt1**	Time frame in which all defrost requirements must occur in order to start defrost	1	200	1	min
21	**dt2**	Minimum time defrost duration, **where 1 unit = 10 sec**	1	200	1	10sec
22	**dt3**	Maximum time defrost duration	1	200	1	min
23	**dt4**	Minimum time between two successive defrosts of the same circuit	1	200	1	min
24	**dt5**	Minimum time between two successive defrost of the two circuits	0	200	0	min
25	**dt6**	ON or OFF time of the valve at the start and at the end of deFrost. If this function is enabled by the **dFS** parameter.	0	20	1	min
26	**dFS**	deFrost value, where: **0 =** At the start and at the end of deFrost the compressors stop in order to rotate the valves with time **dt6** **1 =** The valve rotates without stopping the compressor.	0	1	0	units
27	**d07**	Start of deFrost with 2 circuits. **0 =** Regardless **1 =** When both reach deFrost conditions **2 =** When 1 of 2 reaches deFrost conditions	0	2	2	units
28	**d08**	**0 =**. deFrost ends independently. **1 =** If one is finished, then the compressor turn OFF and waits for the other to finish. In any case, both of them, end from the time pass. **2 =**. If one ends, the other ends.	0	2	0	units
29	**drE**	State of resistance during deFrost. **0 =** OFF , **1 =** ON	0	1	0	units
30	**dF1**	FAN status in deFrost. **0 =** OFF , **1 =** works as in cooling with **SP = FSC**	0	1	0	units
31	**dF2**	FAN. Evaporator drying after deFrost. **0 =** OFF and for **Value → 1-250 sec >** FAN is ON with maximum drying speed.	0	255	0	sec
32	**ASP**	SET POINT ALARM Antifreeze, Safety thermostat	-50	60	4	°C
33	**Adi**	Differential , Safety Thermostat	0,1	20,0	1.5	°C
34	**t3E**	**0 =** this function is disabled. **1 =**. (for water coolers) activates the temperature **SEn3** and **SEn5** as a safety thermostat. **2 =** If t31 is activated also the compressors of 2nd circuits are OFF. (**See parameters dbE and dEn**). deFrost is not needed and we turn it off. **(doP = 0)**	0	1	0	units
35	**rSH**	Resistance SET POINT Heating. Below Set Point, resistance is ON. (Works with T2 , T4).	-50	60	3.6	°C
36	**Adr**	Differential resistance thermostat.	0,1	20,0	1,0	°C
37	**rOF**	Value **=0 →** resistances OFF with whole system OFF. - frost conditions - .	0	1	1	units
38	**rH1**	activation / deactivation of the heating resistance. ON based on Set Point **rSH**. Below Set Point, resistance is ON.	0	1	1	units
39	**rC1**	activation / deactivation of the cooling resistance. ON based on Set Point **rSC**. Below Set Point, resistance is ON (5°C).	0	1	1	units
40	**rSC**	Resistance Set Point Cooling. Below Set Point, resistance is ON (5°C). (Works with T2 , T4).	-50	+150	15,0	°C
41	**SE1**	1. Value=1, the thermostats operate with SENSOR 1 of the INPUT. 2. Value=2 operate with the temperature of the Remote Control Type WM_RC. 3. Value =3 Operate with SENSOR 2 of the OUTPUT.	1	3	1	Μονάδες
42	**SE2**	Sensor activation No 2, where 0 = sensor deactivated, 1 = sensor activated	0	1	1	units
43	**SE3**	Sensor activation No 3, where 0 = sensor deactivated, 1 = sensor activated	0	1	1	units
44	**SE4**	Sensor activation No 4, where 0 = sensor deactivated, 1 = sensor activated	0	1	1	units
45	**SE5**	Sensor activation No 5, where 0 = sensor deactivated, 1 = sensor activated	0	1	1	units
46	**SH1**	Value=0 disables the input of Transmitter HP1. Value = 1 Activates the 1st circuit high pressure 4-20mA input. (with damage to the transmitter, the analog voltage of the FAN is at the maximum value). With the transmitter activated, the SET POINT of the FSC and FSH parameters and the 0-10 Volt output work based on the transmitter signal. With value =2 1st. The high pressure transmitter is activated. 2nd ALARM Pr1, PH1 are activated. 3rd. The fans are controlled by temperature. deFrost is run by temperature only.	0	2	0	units
47	**SH2**	Value=0 ◊ disables the Transmitter HP2 input. Value = 1 ◊ Activates the 4-20 mA input of the high pressure of the 2nd circuit. (with damage to the transmitter, the analog voltage of the FAN is at the maximum value). With the transmitter activated, the SET POINT of the FSC and FSH parameters and the 0-10 Volt output work based on the transmitter signal. With price =2 1st. The high pressure transmitter is activated. 2nd ALARM Pr2, PH2 are activated. 3rd. The fans are controlled by temperature. deFrost is run by temperature only.	0	2	0	units
48	**SL1**	out of order	0	1	0	units
49	**SL2**	out of order	0	1	0	units
50	**rH1**	Adjustment of the mA scale. 1st circuit high pressure inlet (HP1). Display the correct transmitter pressure range, for example instead of 0 – 100 units show 0 - 30,0 Bar.	10	99,9	100	%
51	**rH2**	Adjustment of the mA scale. 2nd circuit high pressure inlet (HP2). Display the correct transmitter pressure range, for example instead of 0 – 100 units show 0 - 30,0 Bar.	10	99,9	100	%
52	**rL1**	Adjustment of the mA scale. 1st circuit low pressure inlet (LP1). Display the correct transmitter pressure range, for example instead of 0 – 100 units show 0 - 30,0 Bar.	10	99,9	100	%
53	**rL2**	Adjustment of the mA scale. 2nd circuit low pressure inlet (LP2). Display the correct transmitter pressure range, for example instead of 0 – 100units show 0 - 30,0 Bar.	10	99,9	100	%

54	**AJ1**	Sensor No 1 offset	-9,0	15,0	0	°C
No	**PARAMETERS**	**DESCRIPTION**	**min**	**max**	**DEFAULT**	**UoM**
55	**AJ2**	Sensor No 2 offset	-9,0	15,0	0	°C
56	**AJ3**	Sensor No 3 offset	-9,0	15,0	0	°C
57	**AJ4**	Sensor No 4 offset	-9,0	15,0	0	°C
58	**AJ5**	Sensor No 5 offset	-9,0	15,0	0	°C
59	**AJ6**	out of order	-	-	-	-
60	**AJ7**	out of order	-	-	-	-
61	**AJ8**	out of order	-	-	-	-
62	**rCt**	Value =1 the thermostat of the Remote Control Type WM_RC control the thermostats of MACON_HP/HPR. The ON-OFF of the Remote Control, ON-OFF respectively the MACON_HP/HPR	0	1	0	Μονάδες
63	**tPC**	**Pump-Compressor** Time. Compressor start time after pump.	0	200	3	sec
64	**tCP**	**Compressor-Pump** Time. OFF time of the pump after OFF of the compressor.	0	200	0	min
65	**tPO**	Intermittent operation of the pump when the compressor is OFF. The **tPO** parameter works in conjunction with the **GFr** parameter. With **GFr = 0** deactivates the function of the **tPO** parameter. If **GFr = 1** and **tPO = 1-100 min**, the pump restarts after the time specified by the parameter (OFF time) and remains ON at the time specified by the parameter **tPd** (time ON).	0	100	0	min
66	**tPd**	It works in conjunction with the **tPO** parameter and sets the operating time of the pump	1	100	1	min
67	**tF1**	Bypass time of **FLOW SWITCH** at pump start	0	200	5	sec
68	**tF2**	Bypass time of **FLOW SWITCH** during operation	0	200	5	sec
69	**too**	Time from ON to ON of the same compressor, where 1 unit = 10 sec	0	200	1	10sec
70	**tFo**	Time from OFF to ON of the same compressor, where 1 unit = 10 sec	0	200	1	10sec
71	**tdC**	Time from ON to ON between the two compressors	0	200	5	sec
72	**tFC**	Time from OFF to OFF between the two compressors	0	200	2	sec
73	**ton**	Minimum compressor operating time	0	200	2	sec
74	**tLP**	Bypass time of low compressor pressure **(LP1, LP2)** at start-up	0	200	3	sec
75	**tLo**	Bypass time of low compressor pressure **(LP1, LP2)** during operation	0	200	3	sec
76	**tAF**	Safety thermostat bypass time at startup	0	200	30	sec
77	**ttA**	**In TANDEM mode**. Switch compressors if only one works for **time > ttA**	2	100	30	min
78	**Grc**	**ON-OFF** Remote Control of the system. Value **= 1** Input enabled. Value **= 0** the keyboard of the device is activated.	0	1	1	units
79	**GrH**	Remote Control of **HEAT-COOL** selection of the system. Value **= 1** Input enabled. Value **= 0** the device keyboard is activated.	0	1	1	units
80	**itY**	**Instrument Type: 1 =** TADEM, **2 =** CAPACITIVE, **3 =** one compressor / circuit.	1	3	1	units
81	**C12**	Common circuit (condenser). Value **= 1** → 1st condenser, Value **= 2** → 2nd condenser. With a **common** condenser, if FAN1 is ON then the FAN2 is ON. If FAN2 is ON then the FAN1 is ON. The parameter only affects the fans. With one condenser and **Value = 1** only the analog output of FAN1 in heating works with the lower value of temperatures/pressures T3, T5 and in cooling with the highest.	1	2	2	units
82	**GAL**	**Alarm function, automatic or manual** Value: **-3 =** states that it will pass the ALARM 3 times as an AUTO RESET within 1 hour. After 1 hour the measurement is initialized to 0. The time counts from the 1st ALARM. Function applies to: HP1, LP1, HP2, LP2. **0 =** alarms manual Reset: HP1, LP1, PH1, At1,FLOW SWITCH,HP2, LP2, PH2, At 2 **1 =** automatic Reset	-3	1	1	units
83	**GSu**	**Valve Inversion Parameter** Value: **0 =** In Cooling the valve relays are OFF and in heating ON **1 =** In Heating the valve relays are OFF and in Cooling ON	0	1	1	units
84	**GFr**	Value: **0**= The pump is running continuously. **1=** The pump starts and stops with the compressors, based on the **tPC** and **tCP** times. If **GFr=1** the parameters **tPO** and **tPd** are activated.	0	1	0	units
85	**Gnc**	Number of circuits, Values: **1 =** One circuit, **2 =** Two circuits	1	2	2	units
86	**GLE**	out of order	0	255	0	-
87	**GPo**	Compressor boot time in Power Up	0	200	0	sec
88	**GLC**	Value: **0=** gives priority to the compressor with the fewest hours **1=** gives constant priority to the compressor 1 **2=** gives constant priority to the compressor 2	0	2	0	units
89	**GFP**	**Pump operation with ALARM safety thermostat in OFF machine condition.** **0 =** the pump is **deactivated** when safety thermostat is activated **1 =** the pump is **activated** when safety thermostat is activated	0	1	1	-
90	**trE**	Time response of the device on network	30	100	30	units
91	**Add**	**0 =** network is deactivated. **1=** Remote Control operation is activated. Address of the device on network from 1 – 255	0	255	1	units
92	**nCo**	**0 =** SLAVE: PC operation **1 =** MASTER: REMOTE CONTROL operation and parameter **Add** = 1	0	1	0	units
93	**C1d**	Lower analog output voltage. Compressor C1 of the 1st circuit. The analog signal 0-10 Volt corresponds consistently to C1. Values from 0 to 4.0 Volt. The analog output will be between **C1U - C1d** in a temperature range defined by parameter **C1H** or **C1C**. For example, **C1U - C1d = 7** and **C1H = 3** and **SHt = 45°C**, the voltage will change **10-3 Volt** from **42 ÷ 45°C** on heating (see figure 5B).	0	5	3,0	Volt
94	**C1U**	C1. Compressor C1 of the 1st circuit Higher voltage at the analog output.	6	10	10,0	Volt
95	**C1H**	C1. Compressor C1 of the 1st circuit. **In the heating:** Temperature range to which the proportional voltage at the output corresponds.	1.0	25.0	3.0	°C
96	**C1C**	C1. Compressor C1 of the 1st circuit. **In the cooling:** Temperature range to which the proportional voltage at the output corresponds.	1.0	25.0	3.0	°C
97	**C1i**	C1. Reverse analog signal at the output	0	1	0	units

98	**C1A**	C1. Compressor C1 of the 1st circuit. Increasing the value reduces the oscillation of the signal 0-10 Volt.	1	40	5	units
No	**PARAMETERS**	**DESCRIPTION**	**min**	**max**	**DEFAULT**	**UoM**
99	**F1d**	FAN 1. Lower analog output voltage. 1st circuit. Values from 0 to 4.0 Volt. The analog output will be between **F1U - F1d** in a temperature range defined by parameter **F1H** or **F1C**. For example, **F1U - F1d = 7** and **F1H = 3** and **SHt = 45 °C**, the voltage will change **10-3 Volts** from **42 ÷ 45 °C** on heating (see figure 6B). When the relays **C1, C1b** are OFF then the analog output is zero In the DRIPING_TIME phase it produces the maximum voltage	0	5	3,0	Volt
100	**F1U**	FAN 1. Higher voltage at the analog output. When the relay of FAN 1 is OFF then the analog output is 0 Volt	6	10	10,0	Volt
101	**F1H**	FAN 1. In the heating. Temperature / pressure range to which the analog output voltage corresponds.	1.0	25.0	3.0	°C
102	**F1C**	FAN 1. In the cooling. Temperature / pressure range to which the analog output voltage corresponds.	1.0	25.0	3.0	°C
103	**F1i**	FAN 1. Reverse analog signal at the output	0	1	0	units
104	**F1A**	FAN 1. Increasing the value reduces the oscillation of the 0-10 Volt signal	1	40	5	units
105	**C2d**	C2. Lower analog output voltage. Compressor C2 of the 2nd circuit. The analog signal 0-10 Volt corresponds consistently to C2. Values from 0 to 4.0 Volts. The analog output will be between **C2U - C2d** in a temperature range defined by the parameter **C2H** or **C2C**. For example, **C2U - C2d = 7** and **C2H = 3** and **SHt =45°C**, the voltage will change **10-3Volt** from **42 ÷ 45°C** on heating (see figure 5B).	0	5	3,0	Volt
106	**C2U**	C2. Higher voltage at the analog output.	6	10	10,0	Volt
107	**C2H**	C2. In the heating. Temperature / pressure range to which the analog output voltage corresponds.	1.0	25.0	3.0	°C
108	**C2C**	C2. In the cooling. Temperature / pressure range to which the analog output voltage corresponds.	1.0	25.0	3.0	°C
109	**C2i**	C2. Reverse analog signal at the output	0	1	0	units
110	**C2A**	C2. Increasing the value reduces the oscillation of the 0-10 Volt signal.	1	40	5	units
111	**F2d**	FAN 2. Lower analog output voltage. 2nd circuit. Values from 0 to 4.0 Volt. The analog output will range between **F2U - F2d** in a temperature range defined by parameter **F2H** or **F2C**. For example, **F2U - F1d = 7** and **F2H = 3** and **SHt = 45 °C**, the voltage will change **10-3 Volt** from **42 ÷ 45 °C** on heating (see figure 6B). When the relays **C2**, **C2b** are OFF then the analog output is zero. In the DRIPING_TIME phase it produces the maximum voltage.	0	5	3,0	Volt
112	**F2U**	FAN 2. Higher voltage at the analog output. When the relay of FAN 2 is OFF then the analog output is 0 Volt	6	10	10,0	Volt
113	**F2H**	FAN 2. In the heating. Temperature / pressure range to which the analog output voltage corresponds.	1.0	25.0	3.0	°C
114	**F2C**	FAN 2. In the cooling. Temperature / pressure range to which the analog output voltage corresponds.	1.0	25.0	3,0	°C
115	**F2i**	FAN2. Reverse analog signal at the output	0	1	0	units
116	**F2A**	FAN 2. Increasing the value reduces the oscillation of the 0-10 Volt signal	1	40	5	units
117	**VtO**	In case the machine is OFF. Time OFF of the valves after the minutes specified by the parameter (See **EOV** parameter).	0	20	0	min
118	**EOV**	If **EOV = 0** and the system is OFF, then the valves are OFF after the time specified by parameter **VtO**. If **EOV = 1** the valves remain in the state specified by the **GSu** parameter.	0	1	0	units
119	**PrE**	***PREVENT***. In case the pressure of circuit 1 becomes higher than the value of the parameter, the ALARM PREVENT **(Pr1)** is activated and turns OFF the 2nd compressor or the CAPACITIVE of the 1st circuit. The same applies to the second circuit. (**Pr2**). Activated if **PEn = 1** and with the parameters **SH1 = 1** and **SH2 = 1** respectively for circuit 1 and 2. With **itY = 3** (1 compressor / circuit) PREVENT is deactivated. **PrE** Set Point works without differential.	5,0	99,9	40,0	units
120	**HPA**	In case the pressure of circuit 1 becomes higher than the value of the parameter, the high pressure ALARM is activated by the transmitter (**P1H**), and turns OFF the compressors of the 1st circuit. The same applies to the second circuit, called ALARM **P2H**. Activated if HEn = 1 and with the parameters **SH1 = 1** and **SH2 = 1** respectively for circuit 1 and 2. The SET POINT of **HPA** works without differential.	5,0	99,9	40,0	units
121	**PEn**	Value**=0** Deactivate the parameter **PrE.** Value **=1** activate the **PrE** parameter.	0	1	0	units
122	**HEn**	Value**=0** Deactivate the parameter **HPA.** Value **=1** activate the **HPA** parameter.	0	1	0	units
123	**CAV**	Reverse operation of CAPACITIVE, C1b and C2b relays. Value **= 0** => ON the relay on the thermostat ON. Value **= 1** => OFF the relay on the thermostat ON.	0	1	0	units
124	**LPA**	ALARM Operation of Low Pressure when the compressor is OFF. Value**=0** => Blocks ALARM. Value **= 1** => ALARM is free	0	1	1	units
125	**ATE**	Τιμή **= 0** → 1 circuit. Τιμή **= 1** → 2 circuits. With 1 circuit **(ATE=0)**, the safety thermostat of the 1st circuit AT1, also stops the compressors of the 2nd circuit	0	1	0	units
126	**bAU**	*Baud rate: 0 = 2400 / 1 = 4800 / 2 = 9600 / 3 = 19200* Enter the new value, exit the parameter menu by pressing ↵ and toggle the power supply of the device	0	3	3	-
127	**UEr**	*Firmware version - no access*	-	-	2.5.X	-
128	**tPE**	*Unique product number – no access*	-	-	115	-

ALARM TABLE		Display flashes when the alarm messages are displayed
1	**HP1**	ALARM HIGH PRESSURE C1: Stops the operation of compressor C1. By adjusting parameter GAL = 0, alarm reset is manual.
2	**LP1**	ALARM LOW PRESSURE C1: Stops the operation of compressor C1. By adjusting parameter GAL = 0, alarm reset is manual. During deFrost, it ignores ALARM LP1.
3	**C1**	ALARM COMPRESSOR C1: Stops the operation of compressor C1. Alarm is only automatically deactivated when the cause of the alarm disappears.
4	**FLS**	ALARM FLOW SWITCH: ALARM from the FLOW SWITCH. By adjusting parameter GAL = 0, alarm reset is manual.
5	**HP2**	ALARM HIGH PRESSURE C2: Stops the operation of compressor C2. By adjusting parameter GAL = 0, alarm reset is manual.
6	**LP2**	ALARM LOW PRESSURE C2: Stops the operation of compressor C2. By adjusting parameter GAL = 0, alarm reset is manual.
7	**C2**	ALARM COMPRESSOR C2: Stops the operation of compressor C2. Alarm is only automatically. Deactivated when the cause of the alarm disappears.
8	**Ar1**	ALARM SENSOR 1: ALARM analog input No 1. Safety thermostat. (Water input). Sensor malfunction. Alarm is only automatically. Deactivated when the cause of the alarm disappears.
9	**Ar2**	ALARM SENSOR 2: ALARM analog input No 2. Safety thermostat. (Water output). Circuit 1. Sensor malfunction. Alarm is only automatically. Deactivated when the cause of the alarm disappears.
10	**Ar3**	ALARM SENSOR 3: ALARM analog input No 3. Defrost Sensor malfunction. Alarm is only automatically. Deactivated when the cause of the alarm disappears.
11	**Ar4**	ALARM SENSOR 4: ALARM analog input No 4. Safety thermostat. (Water output). Circuit 2. Sensor malfunction. Alarm is only automatically. Deactivated when the cause of the alarm disappears.
12	**Ar5**	ALARM SENSOR 5: ALARM analog input No 5. Defrost. Sensor malfunction. Alarm is only automatically. Deactivated when the cause of the alarm disappears.
13	**At1**	ALARM FROST: ALARM from the Safety Thermostat Circuit 1. At compressor's start-up, the thermostat is deactivated based on parameter timer tAF. By adjusting GAL = 0, alarm reset is manual.
14	**At2**	ALARM FROST: ALARM from the Safety Thermostat Circuit 2. At compressor's start-up, the thermostat is deactivated based on parameter timer tAF. By adjusting GAL = 0, alarm reset is manual.
15	**t31**	ALARM Sensor No 3 - Sen3 (deFrost) – in Safety Thermostat mode. See parameter No 34 **t3E**
16	**t32**	ALARM Sensor No 5 – Sen5 (deFrost) – in Safety Thermostat mode. See parameter No 34 **t3E**
17	**nH1**	HP1 transmitter failure. HIGH PRESSURE circuit 1
18	**nH2**	HP2 transmitter failure. HIGH PRESSURE circuit 2
19	**P1H**	ALARM **HP1** from the transmitter 4-20 mA of the 1st circuit. OFF the compressors. RESET manual optional.
20	**P2H**	ALARM **HP2** from the transmitter 4-20 mA of the 1st circuit. OFF the compressors. RESET manual optional.
The alarms are automatically deactivated when the cause of the alarm disappears. See parameter **GAL.**		

MESSAGE BOARD		Display does not flash when displaying messages. Displays the message sequentially for 0.2 seconds and the temperature for 2 seconds.
1	**dP1**	Drainage procedure of the 1ST circuit after deFrost.
2	**dP2**	Drainage procedure of the 2nd circuit after deFrost.
3	**dF1**	deFrost is running on the 1st circuit.
4	**dF2**	deFrost is running on the 2nd circuit.
5	**Pr1**	Protection **PREVENT** 4-20 mA high pressure sensor of the 1st circuit. When the circuit pressure becomes greater than the value of the **PrE** parameter the protection PREVENT (**Pr1**) is activated and OFFs the second compressor or CAPACITIVE of the 1st circuit
6	**Pr2**	Protection **PREVENT** 4-20 mA high pressure sensor of the 2nd circuit. When the circuit pressure becomes greater than the value of the **PrE** parameter the protection PREVENT (**Pr2**) is activated and OFFs the second compressor or CAPACITIVE of the 2nd circuit

FIGURE 1 **MACON HP**

FIGURE 2 **MACON_HPB**

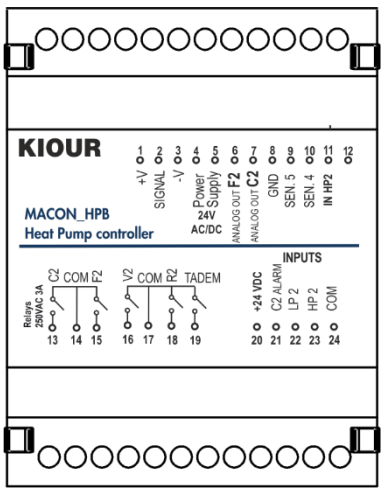


FIGURE 3 **DIMENSIONS**

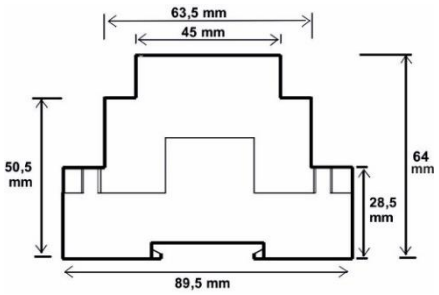
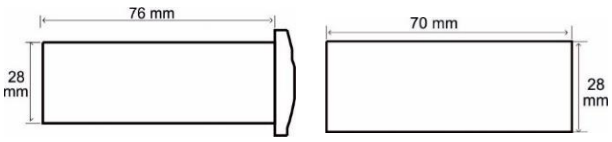
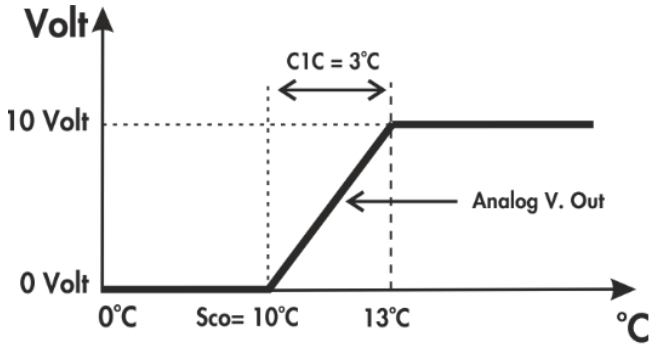


FIGURE 4 **DIMENSIONS**

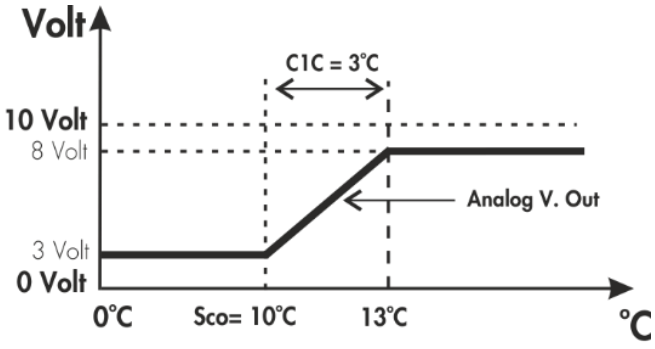


*On the **MACON_HPB**, the flashing **LED** in position **No. 2** indicates that the device is communicating with the main unit. The **LED** in position of terminal **No. 11** indicates that the device is under voltage.*

FIGURE 5A COMPRESSOR C1 COOLING MODE ANALOG OUTPUT OPERATION AND SETTINGS

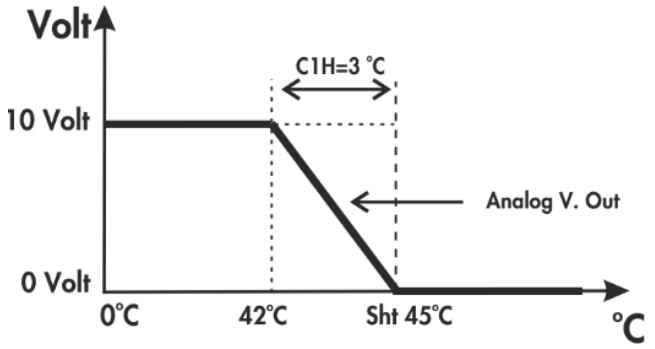


Parameters **C1d= 0Volt** & **C1U=10Volt**
C1C= 3°C

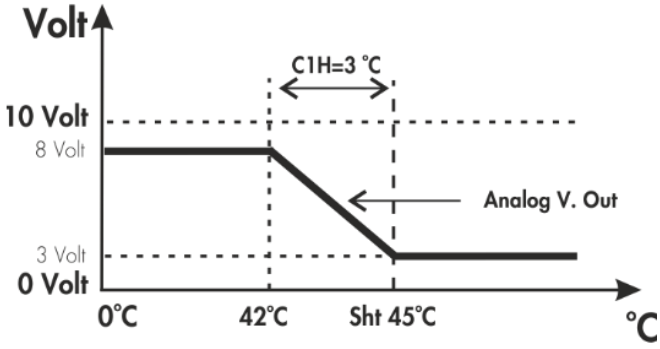


Parameters **C1d= 3.0Volt** & **C1U=8.0Volt**
C1C= 3°C

FIGURE 5B COMPRESSOR C1 HEATING MODE ANALOG OUTPUT OPERATION AND SETTINGS

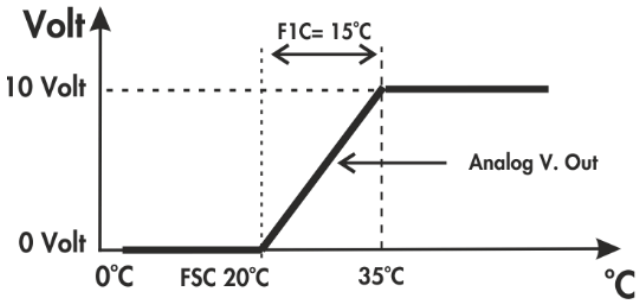


Parameters **C1d= 0Volt** & **C1U= 10Volt**
C1H=3°C

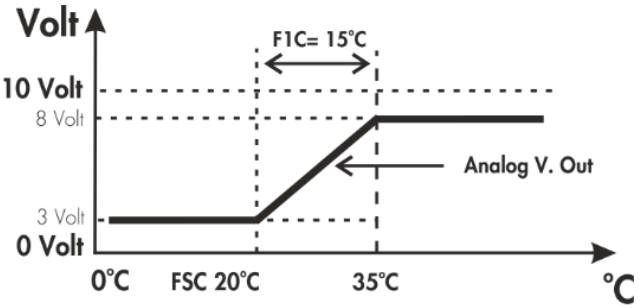


Parameters **C1d= 3.0Volt** & **C1U= 8.0Volt**
C1H=3°C

FIGURE 6A FAN 1 COOLING MODE ANALOG OUTPUT OPERATION AND SETTINGS

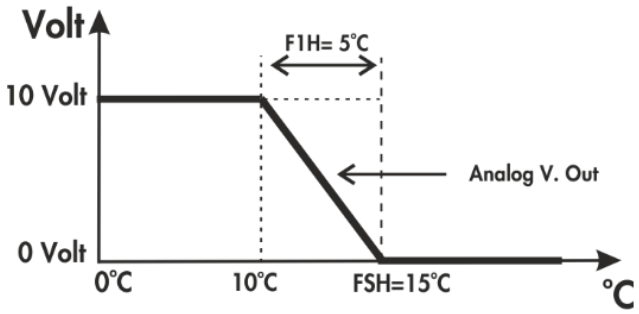


Parameters **F1d= 0Volt** & **F1U= 10Volt**
F1C=15°C

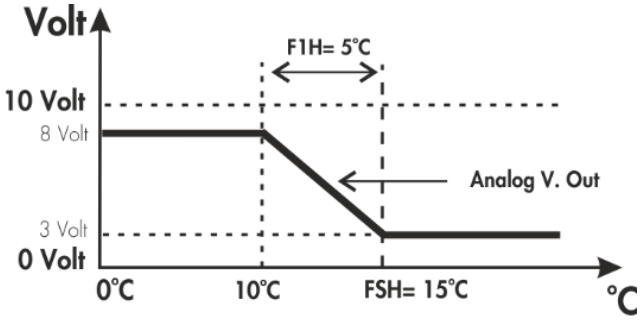


Parameters **F1d= 3.0Volt** & **F1U= 8.0Volt**
F1C= 15°C

FIGURE 6B FAN 1 HEATING MODE ANALOG OUTPUT OPERATION AND SETTINGS



Parameters **F1d= 0Volt** & **F1U= 10Volt**
F1H= 5°C



Parameters **F1d= 3.0Volt** & **F1U= 8.0Volt**
F1H= 5°C

The same applies to FAN 2, respectively with the parameters F2d, F2U, F2C

FIGURE 7 FAN RELAY OPERATION IN HEATING AND COOLING MODE

FIGURE 8 CONNECTION WITH THE REMOTE CONTROL

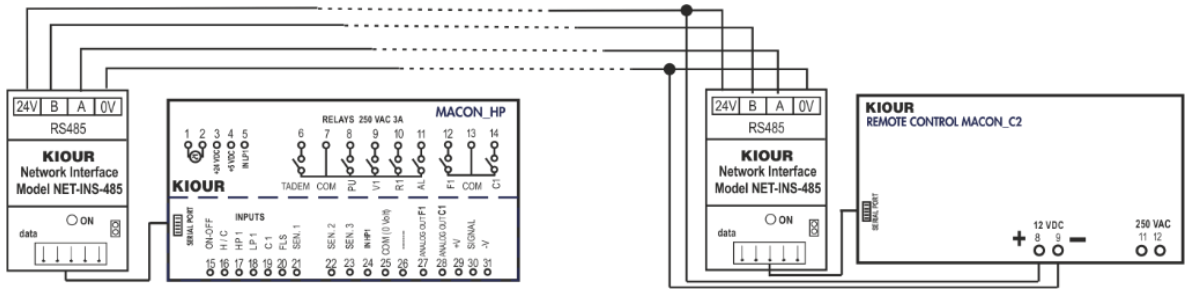


FIGURE 9 INSTRUMENTS CONNECTIONS WITH COMPUTER

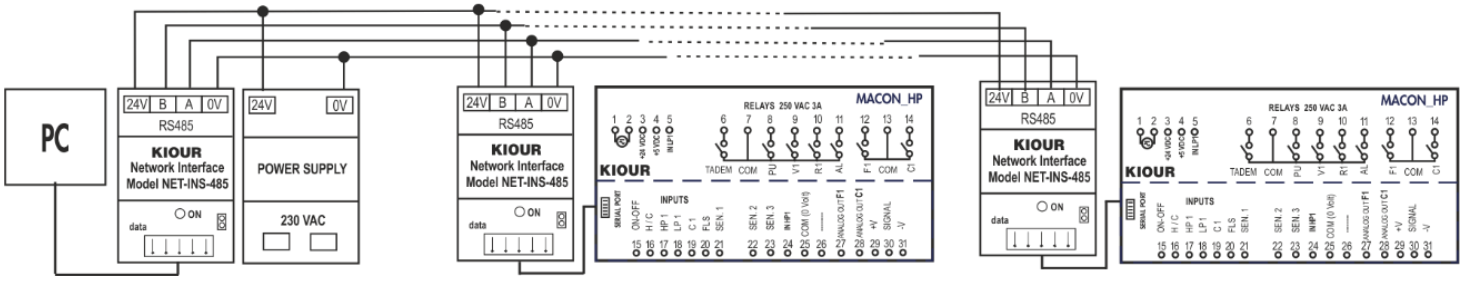
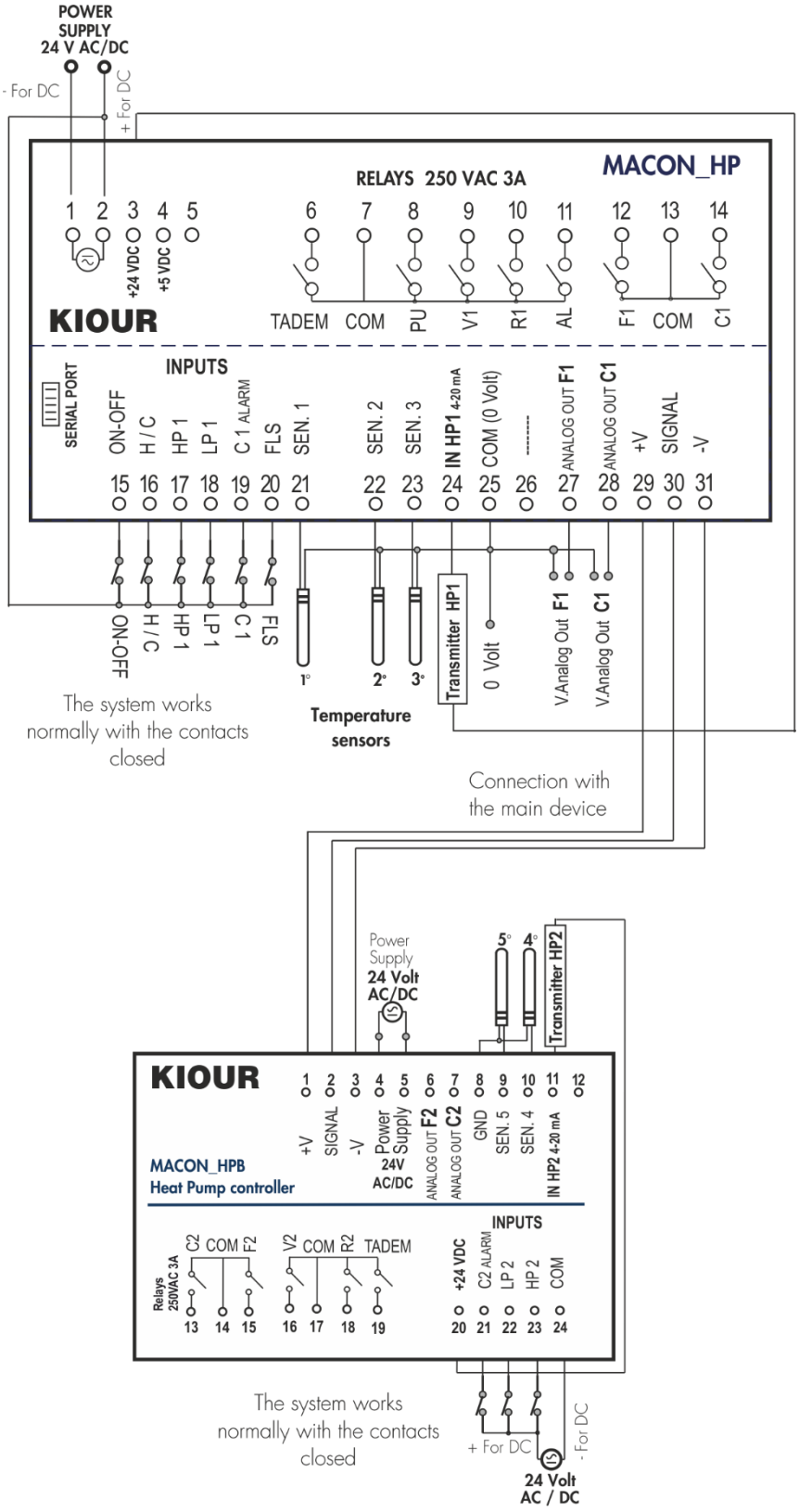


FIGURE 10 **Connection MACON_HP (panel mounting) with MACON_HPB (rail). (1st and 2nd circuit).**

In case of using analog signals, the use of an isolation transformer in the power supply is recommended.



Temperature sensor No 1. Water inlet, circuit 1.

Thermostat operation: HEATING-COOLING

Temperature sensor No 2. Water outlet.

Safety thermostat No. 1. Resistance No. 1.

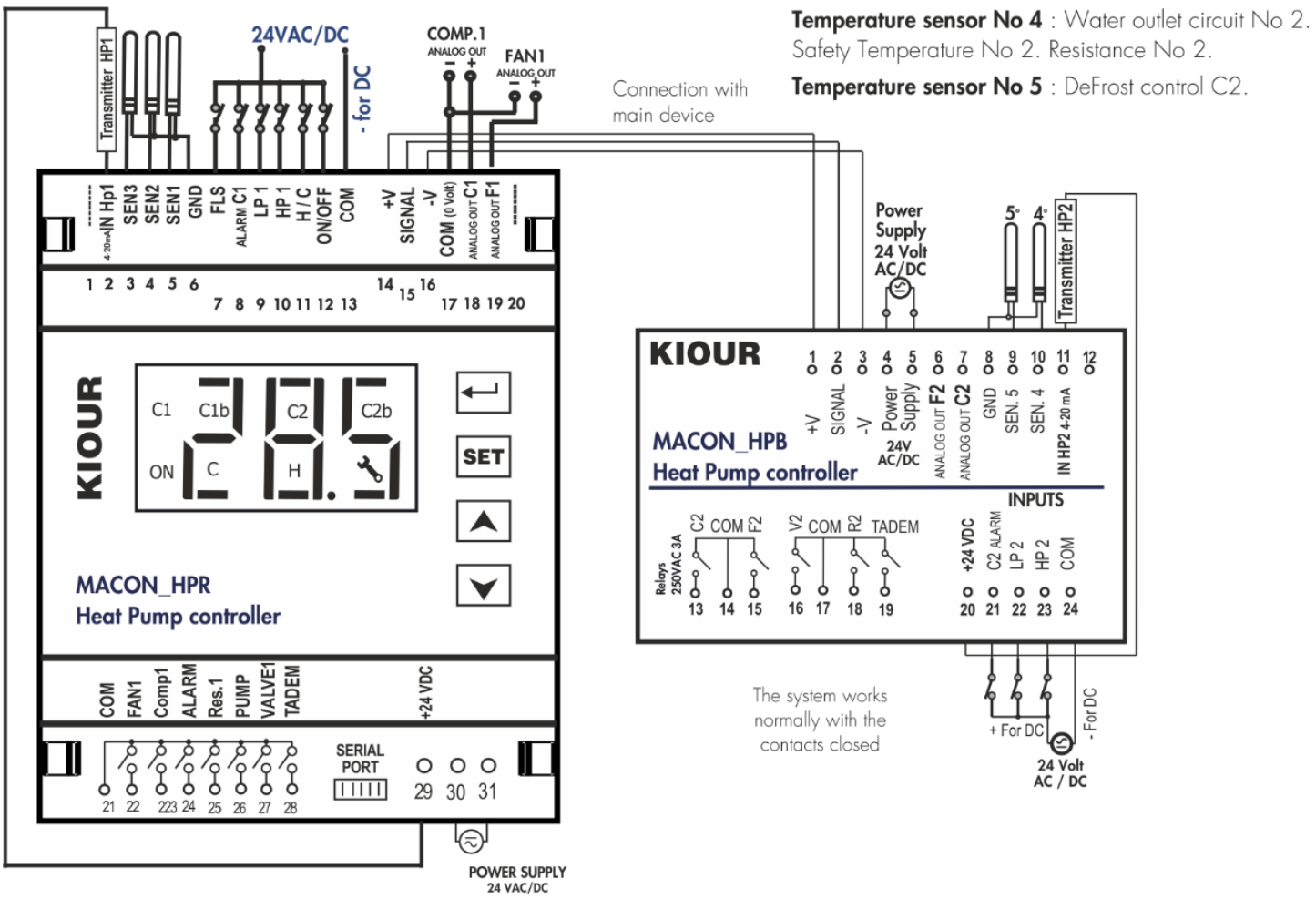
Temperature sensor No 3. deFrost control.

Temperature sensor No 4. Water outlet, circuit 2.

Safety thermostat No 2. Resistance No 2.

Temperature sensor No 5. Defrost control C2

FIGURE11 **Connection MACON_HPR (rail) with MACON_HPB (rail). (1st and 2nd circuit).**



Revision History

PDF Version	Date	Comments
V2.1	6/7/2021	Parameters: 97C1i,103F1i, 109C2i,115F2i ***!!***
V2.2	18/4/2022	Parameter: A/A**. 81**. **C12**. With one condenser, Value=1: the two analog outputs of the fans in the heating mode, work with the lower value of temperatures/pressures T3, T4 and in cooling mode with the highest. Parameter: A/A **82. GAL**. With value = -3, it indicates that ALARM will pass 3 times with AUTO RESET function in 1 hour. Function applies to: HP1, LP1, HP2, LP2. Parameter: A/A **119/120. PRE, HPA**. They work with differential 4.0 Bar.
V2.3	23/9/2022	1st: Added parameter 125=ATE. Value =0 → 1 circuit. Value=1 → 2 circuits. With 1 circuit (ATE=0), the safety thermostat of the 1st circuit AT1, also stops the compressors of the 2nd circuit. 2nd: Added option **2** to parameter **34=t3e**, 2 = If t31 is activated then the compressors of 2nd circuit are OFF.
V2.4	21/11/2022	An additional option (=2) was added to the SH1 and SH2 parameter values. With price =2 1st. The high pressure transmitter is activated. 2nd ALARM Pr1, Pr2, PH1, PH2 are activated. 3rd. The fans are controlled by temperature
V2.5.0	27/6/2023	Added Wi-Fi function and connectivity to cloud platform, new parameters bAU, UEr, tPE. Notification, PREVENT, which stops the 2nd compressor, is not an alarm anymore but a notification, displaying PR1, PR2.
Version 2.6.0	20/7/23	**1.** Parameter 41/se1. 1. Value=1, the thermostats operate with SENSOR 1 of the of the INPUT. 2. Value=2 operate with the temperature of the Remote Control Type WM_RC. 3. Value =3 Operate with SENSOR 2 of the OUTPUT. **2**. Parameter 62 /rCt. Value =1 the thermostat of the Remote Control Type WM_RC control the thermostats of MACON_HP/HPR. The ON-OFF of the Remote Control, ON-OFF respectively the MACON_HP/HPR
Version 2.7.0	10-10-23	At the loading the default values the parameter bAU is not changed e.g.

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ATTENTION: *according to safety standards, the device must be properly positioned and protected from any contact with electrical parts. The device must be fastened in such a way that it cannot be removed without the use of tools. Disconnect the main safety switch of the installation before proceeding to any maintenance. Disconnect the power supply of the device before proceeding to any maintenance. Do not place the device near heat sources, equipment containing strong magnets, in areas affected by direct sunlight or rain. Prevent electrostatic discharges and sharp objects from been inserted to the device. Separate signal cables from power supply cables to prevent electromagnetic disorders. Signal cables must never be in the same pipe with the power supply cables.*

The device is under two year's guarantee. 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.*