

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.

KIOUR

Models: MACON_HP (panel), MACON_HPR (rail) (1st circuit) and MACON_HPB (rail), (2nd circuit) V.2.3

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:

3 analog inputs for measuring temperature with range $-50 \div +150^{\circ}\text{C}$

1 analog high pressure input (HP1) 4-20 mA for transmitter

SENsor 1. Water input circuit 1. Operation thermostat HEATING - COOLING

SENsor 2. Water output. Safety thermostat No1. Resistance No1

SENsor 3. Defrost control C1 (Compressor 1st)

6 digital inputs:

1st input → Terminal block 15. ON-OFF device from a remote switch

2nd input → Terminal block 16 HEAT-COOL from a remote switch

3rd input → Terminal block 17 HP1. High pressure 1st circuit

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.

2 analog outputs 0-10 Volt. → Compressor **C1** (Terminal blocks 25, 28), and for the fan **FAN1** (Terminal blocks 25, 27).

MACON_HPB (2nd circuit) has the following specifications:

2 analog inputs for measuring temperature with range $-50 \div +150^{\circ}\text{C}$

1 analog high pressure input (HP1) 4-20 mA for transmitter

SENsor 4. Water output 2nd circuit. Safety thermostat No2. Resistance No2.

SENsor 5. Defrost C2 control (2nd circuit).

3 digital outputs:

7th input → Terminal block 23 HP2. High pressure 2nd circuit

8th input → Terminal block 22 LP2. Low pressure 2nd circuit

9th input → Terminal block 21 C2. Thermal of 2nd circuit compressor

5 relay outputs 250VAC 5Amp: compressor relay **C2**, valve **V2**, resistance **R2**, fan **FAN 2**, compressor **C2b** Tadem or capacitive.

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 mm²

7 relays 250VAC 5A/3A Resistive Load in MACON_HP

5 relays 250VAC 5A Resistive Load in MACON_HPB

Operation temperature: $-10 \div +50^{\circ}\text{C}$

Storage temperature: $-20 \div +80^{\circ}\text{C}$

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.

dFrost

Pressing the SET button for 5 sec starts dFrost 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 dFrost.

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	- - - - -	- - - - -	- - - - -	hours
A11	h 1	Compressor C1 operation hours				
A12	h1b	Compressor C1b operation hours				
A13	h2	Compressor C2 operation hours				
A14	h2b	Compressor C2b operation 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 1 st circuit the 1 st ON at 10°C the second ON at 11°C (TADEM). The 3 rd of the 2 nd circuit, ON at 12°C and the 4 th ON at 13°C (TADEM). In circuits with a compressor / circuit, the 1 st of the 1 st ON circuit at 10°C and the 2 nd of the 2 nd 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 dFrost 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 dFrost. If this function is enabled by the dFS parameter.	0	20	1	min
26	dFS	dFrost 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 dFrost with 2 circuits. 0 = Regardless 1 = When both reach dFrost conditions 2 = When 1 of 2 reaches dFrost conditions	0	2	2	units
28	d08	0 = dFrost 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 dFrost. 0 = OFF , 1 = ON	0	1	0	units
30	dF1	FAN status in dFrost. 0 = OFF , 1 = works as in cooling with SP = FSC	0	1	0	units
31	dF2	FAN. Evaporator drying after dFrost. 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 2 nd circuits are OFF. (See parameters dbE and dEn). dFrost 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	out of order	0	1	1	units
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. Value = 1 → Activates the 4-20 mA input of the high pressure of the 1 st circuit. (Transmitter HP1) (when there is transmitter failure the analog voltage of the FAN is at the maximum value). When transmitter is activated, the Set Point of the FSC and FSI parameters and the 0-10 Volt output work based on the transmitter signal. deFrost operation is run by temperature only.	0	1	0	units
47	SH2	Value = 0 → disables the input. Value = 1 → Activates the 4-20 mA input of the high pressure of the 2 nd circuit. (Transmitter HP2) (when there is transmitter failure the analog voltage of the FAN is at the maximum value). When transmitter is activated, the Set Point of the FSC and FSH parameters and the 0-10 Volt output work based on the transmitter signal. deFrost operation is run by temperature only.	0	1	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. 1 st 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. 2 nd 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. 1 st 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. 2 nd 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
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

No	PARAMETERS	DESCRIPTION	min	max	DEFAULT	UoM
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	AJ9	out of order	-	-	-	-
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 → 1 st condenser, Value = 2 → 2 nd 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.	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 2 nd 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 2 nd compressor or CAPACITIVE of the 1st circuit. <u>The same applies to the second circuit. (Pr2)</u> . 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. <u>The same applies to the second circuit, called ALARM P2H</u> . 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	T ₁ μ ₁ = 0 → 1 circuit. T ₁ μ ₁ = 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

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 (dFrost) – in Safety Thermostat mode. See parameter No 34 t3E
16	t32	ALARM Sensor No 5 – Sen5 (dFrost) – 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.
21	Pr1	ALARM 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 ALARM PREVENT (Pr1) is activated and OFFs the second compressor or CAPACITIVE of the 1st circuit
22	Pr2	ALARM PREVENT 4-20 mA high pressure sensor of the 2 nd circuit. When the circuit pressure becomes greater than the value of the PrE parameter the ALARM PREVENT (Pr2) is activated and OFFs the second compressor or CAPACITIVE of the 2 nd circuit
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 1 ST circuit after deFrost.	
2	dP2	Drainage procedure of the 2nd circuit after deFrost.	
3	dF1	dFrost is running on the 1 st circuit.	
4	dF2	dFrost is running on the 2 nd circuit.	

FIGURE 1 MACON HP **FIGURE 2** MACON_HPB **FIGURE 3** DIMENSIONS

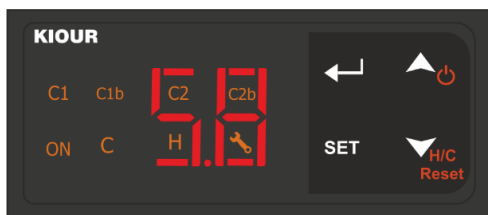
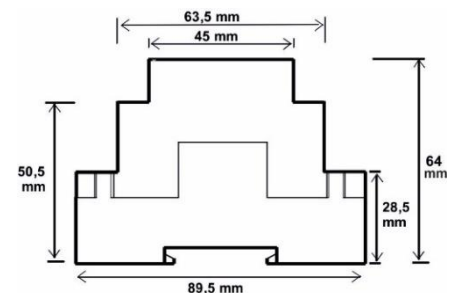
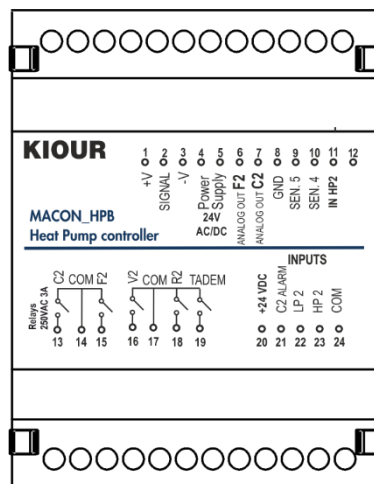
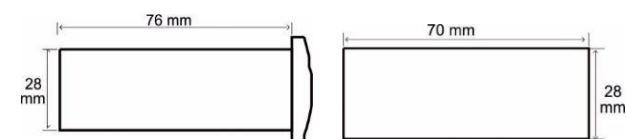
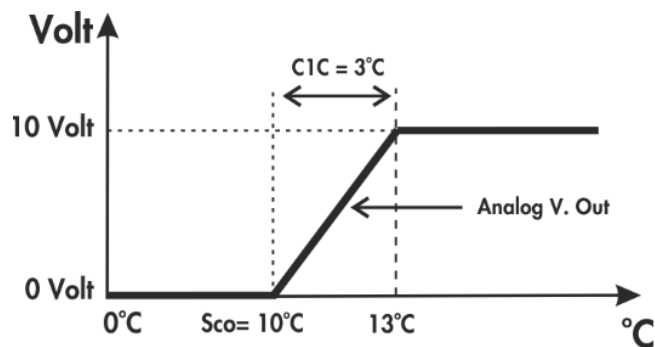


FIGURE 4 DIMENSIONS



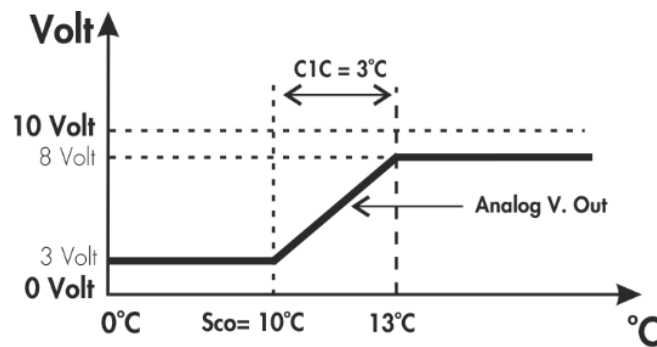
On the **MACON_HPB**, the flashing **LED** in position **No. 2** indicates that the device is communicating with the main unit. The **LED** in position of terminal **No. 11** indicates that the device is under voltage.

FIGURE 5A COMPRESSOR C1 COOLING MODE



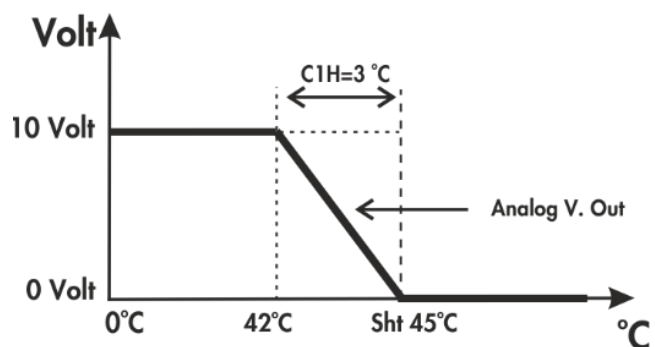
Parameters $C1d=0\text{Volt}$ & $C1U=10\text{Volt}$
 $C1C=3^{\circ}\text{C}$

ANALOG OUTPUT OPERATION AND SETTINGS



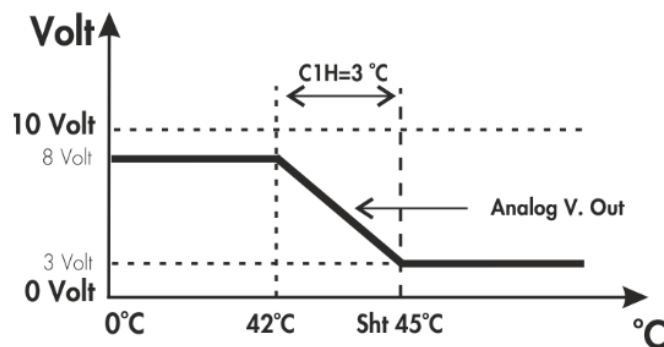
Parameters $C1d=3.0\text{Volt}$ & $C1U=8.0\text{Volt}$
 $C1C=3^{\circ}\text{C}$

FIGURE 5B COMPRESSOR C1 HEATING MODE



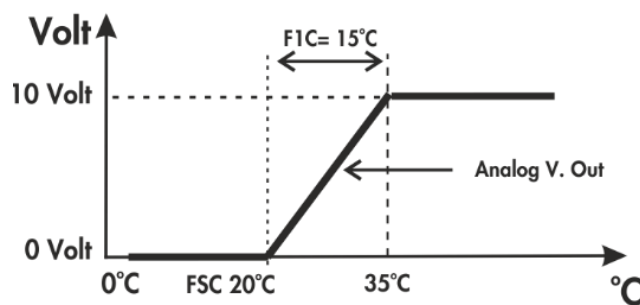
Parameters $C1d=0\text{Volt}$ & $C1U=10\text{Volt}$
 $C1H=3^{\circ}\text{C}$

ANALOG OUTPUT OPERATION AND SETTINGS



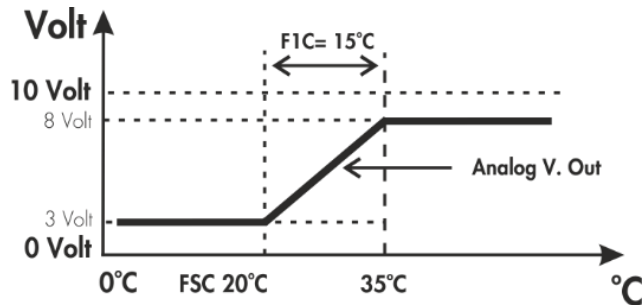
Parameters $C1d=3.0\text{Volt}$ & $C1U=8.0\text{Volt}$
 $C1H=3^{\circ}\text{C}$

FIGURE 6A FAN 1 COOLING MODE



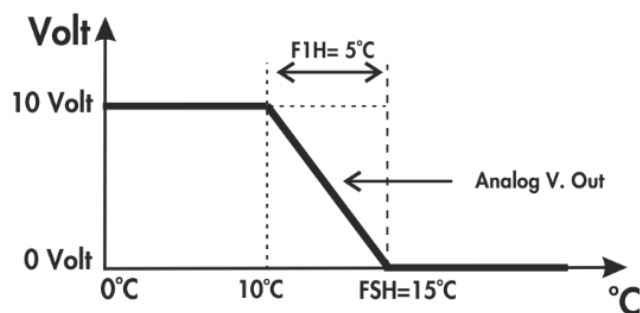
Parameters $F1d=0\text{Volt}$ & $F1U=10\text{Volt}$
 $F1C=15^{\circ}\text{C}$

ANALOG OUTPUT OPERATION AND SETTINGS



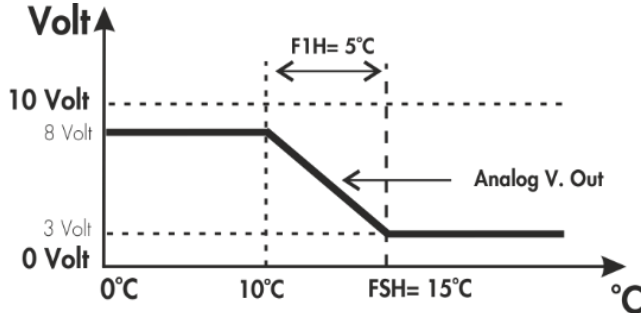
Parameters $F1d=3.0\text{Volt}$ & $F1U=8.0\text{Volt}$
 $F1C=15^{\circ}\text{C}$

FIGURE 6B FAN 1 HEATING MODE



Parameters $F1d=0\text{Volt}$ & $F1U=10\text{Volt}$
 $F1H=5^{\circ}\text{C}$

ANALOG OUTPUT OPERATION AND SETTINGS



Parameters $F1d=3.0\text{Volt}$ & $F1U=8.0\text{Volt}$
 $F1H=5^{\circ}\text{C}$

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

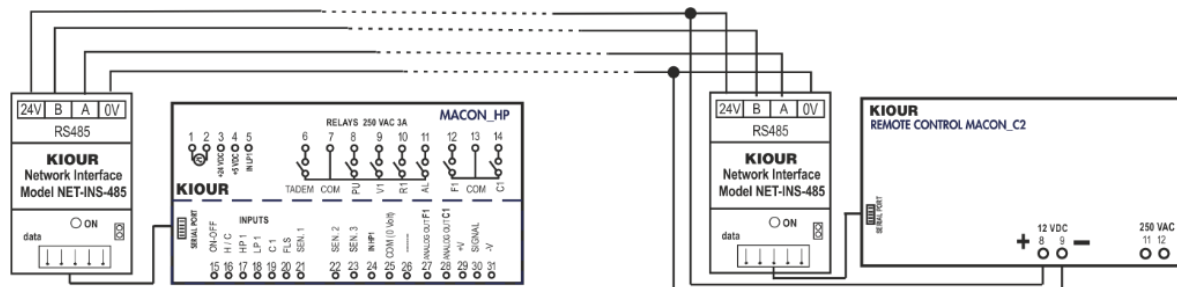


FIGURE 9 INSTRUMENTS CONNECTIONS WITH COMPUTER

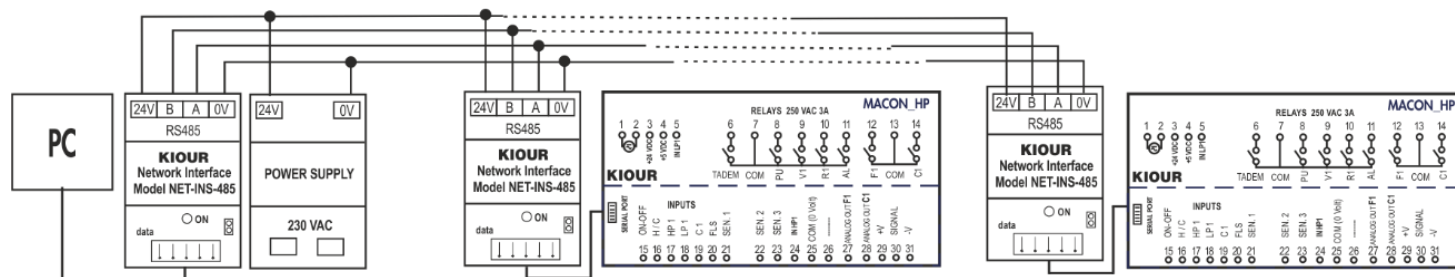
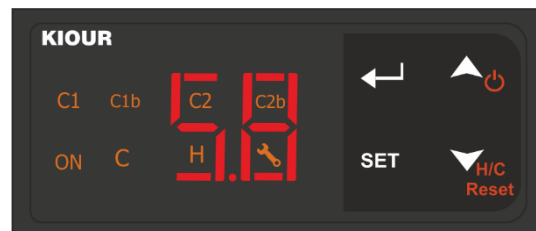
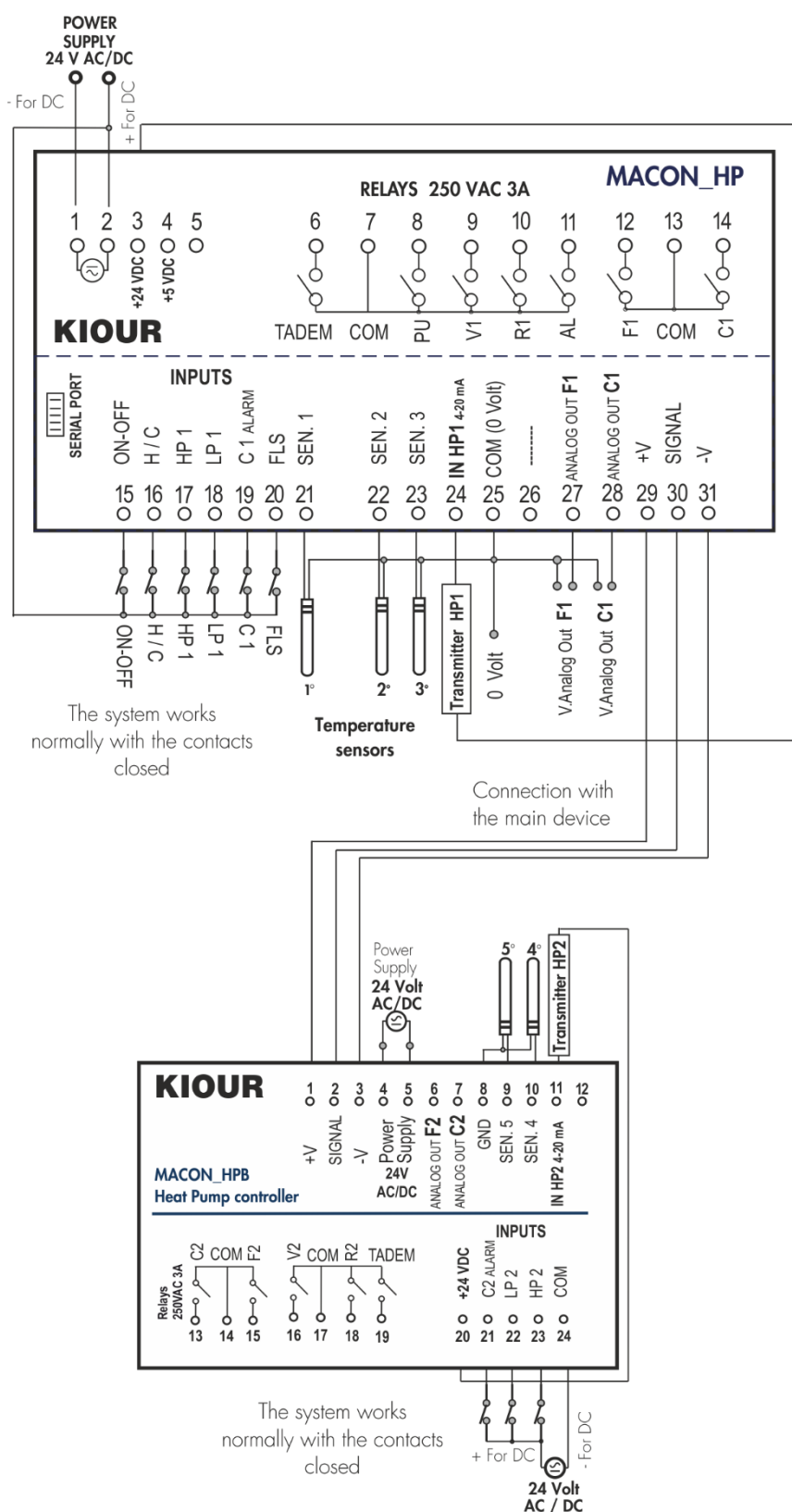


FIGURE 10 Connection MACON_HP (panel mounting) with MACON_HPB (rail). (1st and 2nd circuit).

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.

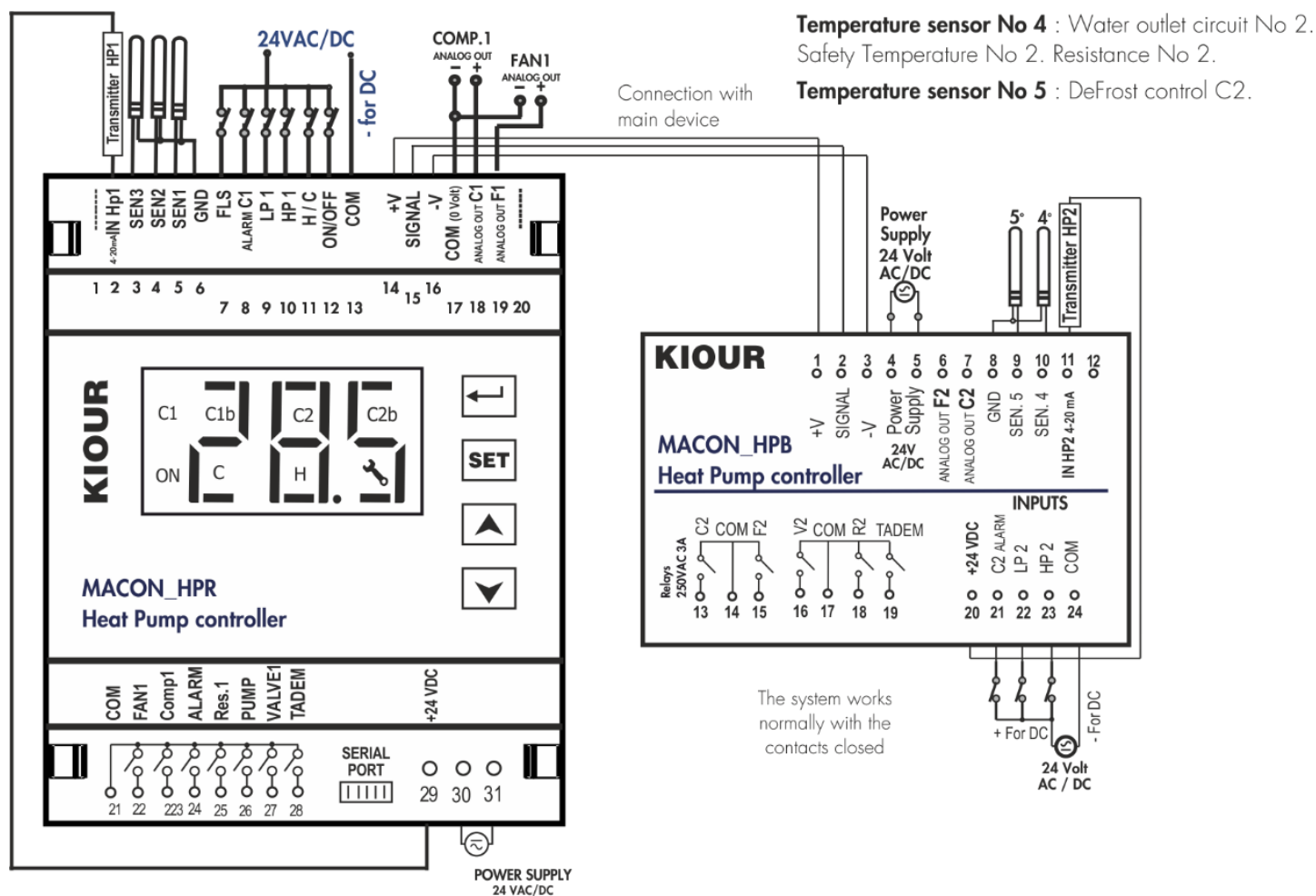
Temperature sensor No 3. deFrost control.

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).



Versions: V2.1.06-07-21. Παράμετροι: 97C1i, 103F1i, 109C2i, 115F2i *!!*

Version 2.2. 18-4-22.

-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.

Version V2.3. 23-9-22. 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.

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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.