AUTOCLIMA
QUALITY & COMFORT

80817400.4 - Febbraio 2016

20235092

AUTOCLIMA S.p.A.
Via Cavalieri di Vittorio Veneto, 15 Tel. (011) 944.32.10
Telefax (011) 944.32.30
10020 CAMBIANO (TO) Italy
Internet: http://www.autoclima.com e-mail: sales@autoclima.com

CENTRALINA DIGITALE DI CONTROLLO PER CLIMATIZZATORE

(CALDO / FREDDO - 12V / 24V)

DIGITAL CONTROL UNIT FOR AIR CONDITIONER SYSTEM

(HEATING / COOLING - 12V / 24V)

CENTRALE DIGITALE DE CONTRÔLE POUR CLIMATISEUR

(CHAUD / FROID - 12V / 24V)

DIGITALES STEUERGERÄT FÜR KLIMAANLAGE

(KALT / WARM - 12V / 24V)

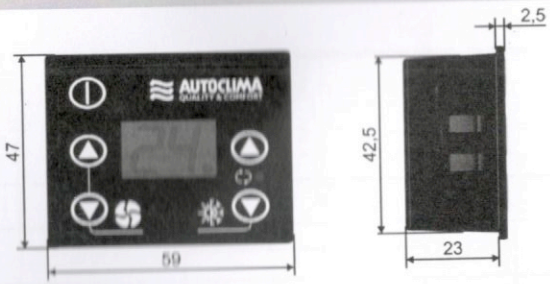
CENTRALITA DIGITAL DE CONTROL PARA CLIMATIZADOR

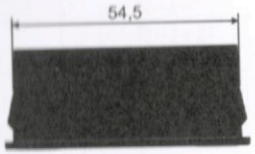
(CALIENTE / FRÍO - 12V / 24V)

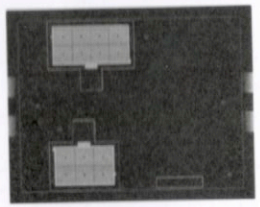
COD. 20235092

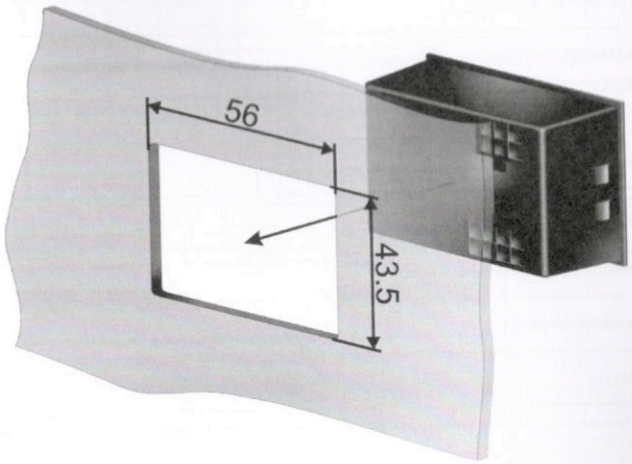
AUTOCLIMA
QUALITY & COMFORT

11) DIMENSIONI E ISTRUZIONI DI MONTAGGIO:







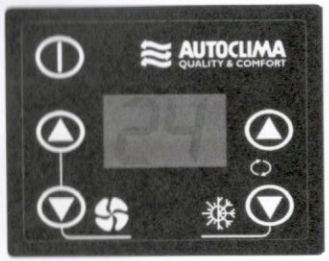


SECTION 2 ENGLISH

CONTENTS

1) INTRODUCTION:

The Digital Control Unit for Air Conditioner System is a microprocessed equipment designed to control and survey an air conditioner system. It operates on the fans and compressor in order to achieve the desired temperature levels inside the vehicle. It receives information from the temperature sensor and the pressure switches. It is composed of a basic unit: the control panel, which is installed in the driver's panel.



2) SYSTEM OPERATION:

2.1) Control Panel:

The Control Panel in the driver's panel has the main CPU and it is composed by a keyboard for the conditioning air system's operational programming, and also by a numerical display for the visualization of parameters, operational status and temperature.

2.2) Power:

When the control unit is powered, the operation depends on the value set of the parameter **rA (automatic restart)** (see paragraph 3):

- **rA = 0** the control unit always starts in the waiting ***stand by*** mode.
  The decimal point of the display blinks indicating the control panel is in ***stand by.***

  To turn the panel ON, press and immediately release  (POWER), and showing the ***set-point*** afterwards.

  To turn the panel OFF, press  (POWER) for three seconds.

- **rA = 1** the control unit automatically restarts with the settings at the time of shutdown caused by power failure.

  In ***stand by*** condition, to turn the panel ON, press and immediately release  (POWER), and showing the ***set-point*** afterwards.

  To turn the panel OFF, press  (POWER) for three seconds.

2.3) Numeric display:

The display depends on the value of the **Ut** parameter setting.

It also allows the user to see the **temperature read by the sensor** and the parameters. It warns the driver of system failures.

If **Ut** = 0 **(default)**, the display usually shows the programmed/desired temperature ***(set-point)***.

If **Ut** = 1, the display usually shows the **temperature read by the sensor**; this state of operation is recognisable by the decimal point in the bottom right corner. The sensor has to be positioned in the area where you wish to control the temperature.

2.4) Display method:

2.4.1) Display with Ut = 0 (default):

If you are in a condition of default (**Ut** = 0), with the display usually showing the programmed/desired temperature ***(set-point)***:

- the **temperature read by the sensor** is displayed by pressing the  button (POWER) for one second. While the temperature is displayed, the decimal point in the bottom right corner continues to be visible. After 6 seconds, or by pressing the  button (POWER), the programmed/desired temperature ***(set-point)*** is displayed again.

2.4.2) Display with Ut = 1:

If you are in a condition of **non**-default (Ut = 1) with the display usually showing the **temperature read by the sensor**:

- the programmed/desired temperature ***(set-point)*** is displayed by pressing the button (POWER) for one second. After 6 seconds, or by pressing the button (POWER), the **temperature read by the sensor** is displayed again. While the temperature is displayed, the decimal point in the bottom right corner continues to be visible.

2.5) Desired temperature setting *(Set-point)*:

The ***Set-point*** is the programmed/desired temperature. Regardless of the display method:

- to set the desired temperature, press the (UP) or (DOWN) button. The ***set-point*** temperature is displayed. Press these buttons again until the desired temperature is reached.

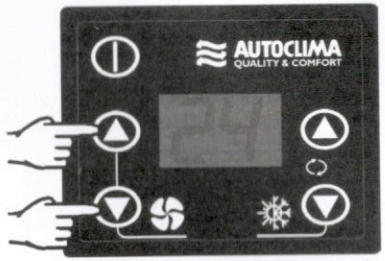
The parameter P0 allows control of the temperature sensor offset.

The set temperature ***(set-point)***, along with parameter dC, which determines the stop or start of the compressor.

2.6) Ventilation:

The control panel contains the ***ventilation*** control. This function works in four levels: Au (automatic speed), u 1 (low speed), u2 (medium speed) and u3 (high speed); Au→u 1→u2→u3.

To change speed press (VENT-UP) or (VENT-DOWN), adjusting to the desired speed.



Changing the speed of the evaporator fans

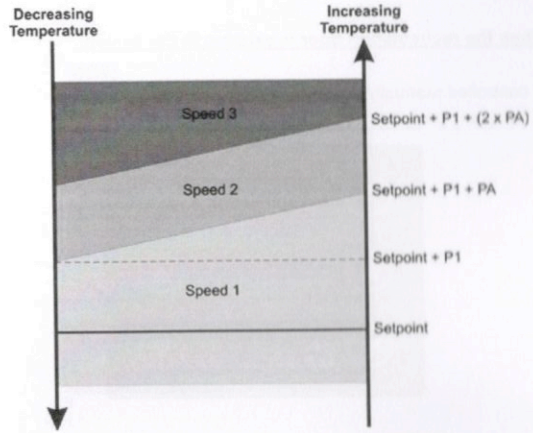
2.6.1) Manual ventilation

Select the required speed between u 1, u2 e u3.

2.6.2) Automatic ventilation

Select Au.

In **cooling** operation mode, the speed is controlled on the basis of the temperature ***set-point*** and parameters P 1, and PA as shown in the following diagram:



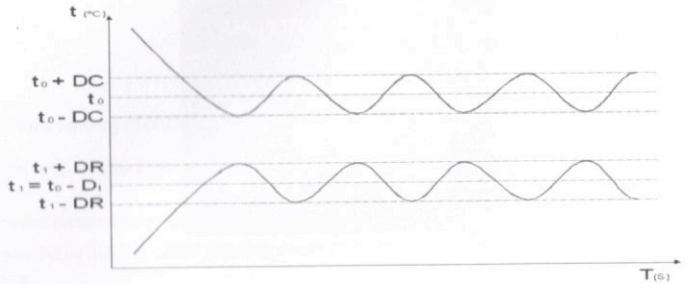
In **heating** operation mode is set up and maintained by default the low speed u 1.

2.7) Cooling and heating:

2.7.1) Cooling

Cooling will be automatically turned ON when the temperature is higher than the ***set-point*** value + the dC parameter.

It will be automatically turned OFF when the temperature is lower than the ***set-point*** - the dC parameter. There will be 30 seconds when the compressor is turned on again.



Cooling and heating system graphic

t0	**Temperature displayed on panel *(set-point)***
t1	**Heating setpoint temperature (in t0 function)**

2.7.2) Heating

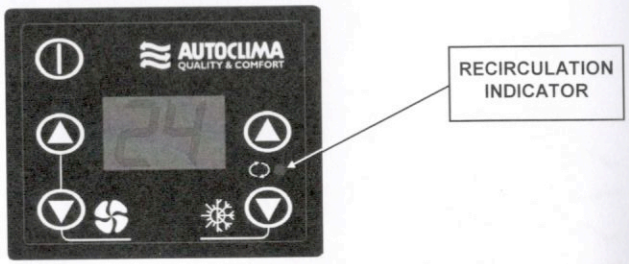
Heating is turned ON when temperature is lower than: ***Set-point*** value - dr parameter - dt parameter;

Heating will be turned OFF when temperature is higher than: ***Set-point*** value + dr parameter - dt parameter.

2.8) Recirculation control (REC):

Feature available only when the recirculation door is existing in the system.

The recirculation (REC) is controlled manually. To change its position press  (UP) for two seconds.



When the recirculation indicator led is turned ON, the air renewal is disactivated and there is no air renovation. When the led is OFF, the air renewal is activated and there is air renovation.

2.9) Gas charge:

This function ("gas charge") allows turning the air conditioner on no matter what temperature the sensor is indicating. It activates the compressor, the condenser and the evaporator at low speed, if the pressure input is ON.

This function ("gas charge") can only be activated in Test mode.

3) SYSTEM PARAMETERS:

Parameter	Function	Default	Step	Min	Max
P0	Temperature sensor offset	0°C	1°C	-5°C	5°C
P1	Automatic ventilation parameter control	1	1	1	5
P4	Maximum value of set-point	30°C	1°C	0°C	35°C
P5	Minimum value of set-point	16°C	1°C	-19°C	24°C
PA	Automatic ventilation differential control	1	1	1	5
dC	Cooling temperature differential	1°C	0,5°C	0,5°C	4°C
dt	Temperature diferencial for heating set-point	2°C	0,5°C	1°C	6°C
dr	Heating temperature differential	1°C	0,5°C	0,5°C	4°C

Parameter	Function	Default	
CF	Visualization: ° Celsius / Fahrenheit	1 = °C	0 = F
rA	Automatic restart	0 = Restart in stand-by mode	1 = Automatic restart with the last setting
Ut	Temperature visualization	0 = Set point visualization	1 = Sensor temperature visualization

Obs: If P4 = P5 **the display will show the message** bL **indicating the *set-point* block.**

To display input and output view mode press (VENT-DOWN) and (DOWN) at the same time.

Two horizontal lines will be displayed. Enter the password 53.

To enter the password, press (VENT-DOWN) to change the left number and (DOWN) to change the right number till you have the number 53 displayed.

Pressing (VENT-UP) P0 parameter will be displayed; to go the next one press (UP) e (DOWN). To exit press (POWER).

To display parameter value, press (VENT-UP) and (UP) or (DOWN) to change parameter value.

To go back to parameter selection, press (VENT-UP). To exit press (POWER).

4) INPUT AND OUTPUT OVERVIEW:

This panel allows the control of input and output, showing if they are activated or not.

To display input and output view mode press (VENT-DOWN) and (DOWN) at the same time.

Two horizontal lines will be displayed. Enter the password 11.

To enter the password, press (VENT-DOWN) to change the left number and (DOWN) to change the right number till you have the number 11 displayed.

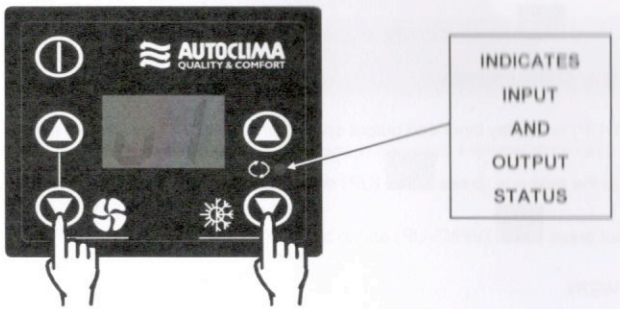
Press (VENT-UP) to display input and output.

To change item press (UP) or (DOWN). To exit, press (POWER).

The recyrculation indicator LED will show the status of the input and output:

if the LED is on, the input/output is **ON**;

if the LED blinks, the input/output is **OFF**.



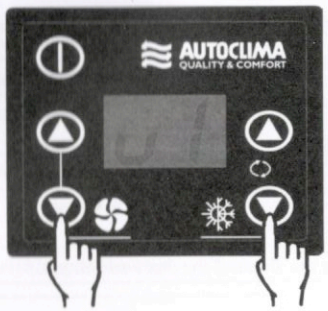
INPUT AND OUTPUT VIEW TABLE

Indication	Meaning
u1	Low speed evaporator output
u2	Medium speed evaporator output
u3	High speed evaporator output
CL	Compressor output
Ht	Heater output
FA	Recyculation (REC) output
Pr	Pressure switch input

5) TEST MODE:

Use this mode to test input and output and MODIFY their status.

To start the test mode, press (VENT-DOWN) and (DOWN) for two seconds.



Two horizontal lines will be displayed. Enter password 86.

To enter the password, press (VENT-DOWN) to change the left number and (DOWN) to change the right number till you have the number 86 is displayed.

Then press (VENT-UP) to display input and output options or press (POWER) to exit.

The first test is u 1, to go the next one, press (UP) or (DOWN).

To activate an input/output press (VENT-UP) and to turn it off press (VENT-UP) again.

To exit press (POWER).

TESTS TABLE

Indication	Meaning
u1	Low speed evaporator output
u2	Medium speed evaporator output
u3	High speed evaporator output
Ht	Heater output
FA	Recyculation (REC) output
CG	Gas charge mode output

6) FAILURES:

In case of any failure in the pressure switch the message FP is displayed and the compressor is turned off. The compressor will be automatically turned on three minutes after the failure is over.

If the Digital Control Unit is in CG (gas charge) mode, the display will show CG alternately with FP, and the compressor will be turned off. 30 seconds after the failure is over the compressor is automatically turned on.

In case the temperature sensor opens, the panel will display an OP. If the sensor short-circuits the panel displays SC.

Failure	Description
FP	Pressure switch failure
OP	Open temperature sensor
SC	Temperature sensor short-circuit

7) PROTECTION:

- The control panel has short-circuit protected output, in which operates a temperature circuit.
- Maximum output current per pin is 450 mA @ 25ºC.

8) OPERATIONAL CONDITIONS:

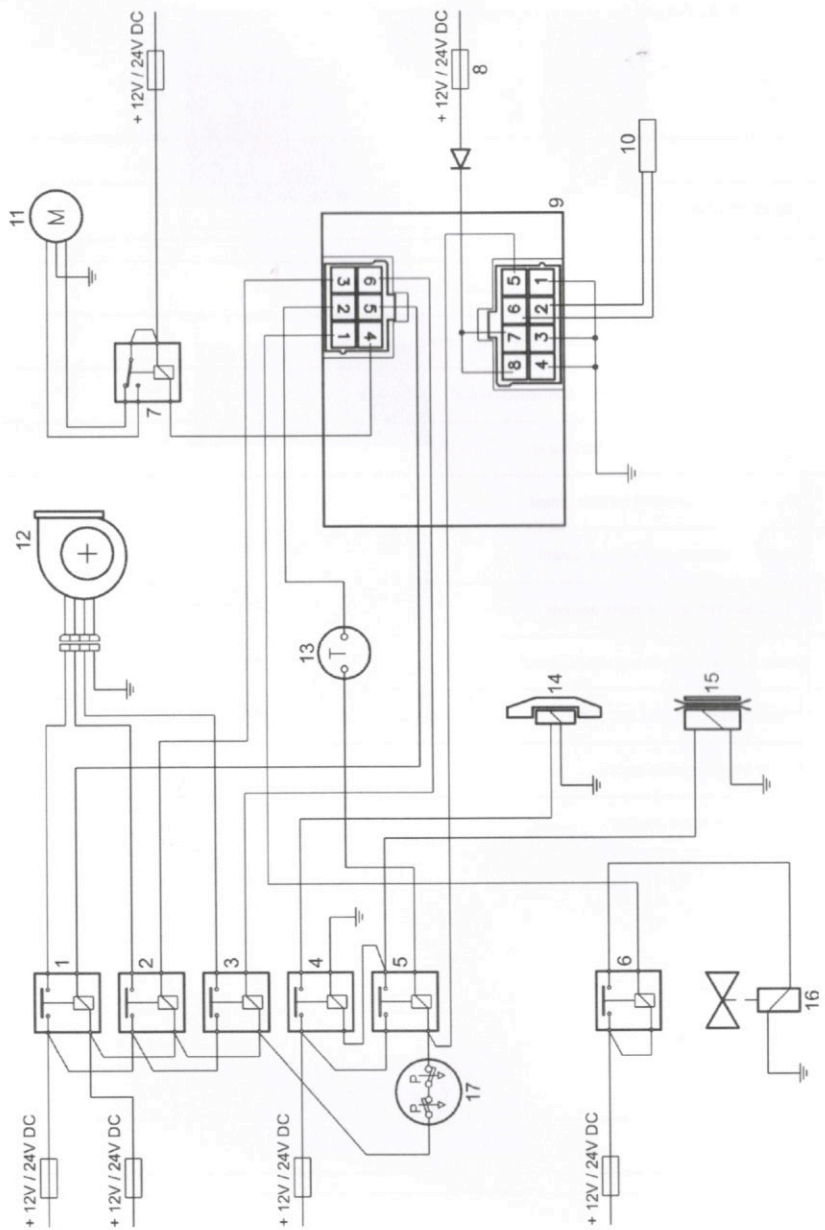
- The Control Unit must be operated in a temperature range of -10ºC to 70ºC.
- The Control Unit must be operated in ideal moist and temperature conditions.
- The Control Unit operates with a nominal voltage of 12V and 24V DC.
- In continuous operation, the Control Unit must receive voltages from 10V to 29V DC, all functions operating.
- The electronic system must support a voltage of 32V DC, for five minutes, without permanent damages.
- The control circuit must support a voltage of -12V DC / -24V DC (polarity inversion) indefinitely, without any damages.

9) ATTACHED:

TEMPERATURE SENSOR

Temp.	KOhm	Temp.	KOhm	Temp.	KOhm	Temp.	KOhm	Temp.	KOhm	Temp.	KOhm
-20	97,072	-4	41,158	12	18,089	28	8,777	44	4,543	60	2,487
-19	91,613	-3	38115	13	17,254	29	8,408	45	4,368	61	-
-18	86,494	-2	36,187	14	16,462	30	8,056	46	4,201	62	-
-17	81,689	-1	34,368	15	15,711	31	7,721	47	4,041	63	-
-16	77,183	0	32,650	16	14,988	32	7,402	48	3,888	64	-
-15	72,951	1	31,029	17	14,322	33	7,098	49	3,742	65	-
-14	68,977	2	29,498	18	13,680	34	6,808	50	3,602	66	-
-13	65,242	3	28,051	19	13,071	35	6,531	51	3,468	67	-
-12	61,732	4	26,684	20	12,492	36	6,267	52	3,339	68	-
-11	58,431	5	25,391	21	11,942	37	6,015	53	3,216	69	-
-10	55,325	6	24,169	22	11,419	38	5,775	54	3,099	70	-
-9	52,404	7	23,012	23	10,922	39	5,545	55	2,986	71	-
-8	49,654	8	21,917	24	10,450	40	5,326	56	2,877	72	-
-7	47,064	9	20,881	25	10,000	41	5,117	57	2,774	73	-
-6	44,625	10	19,889	26	9,572	42	4,917	58	2,674	74	-
-5	42,326	11	18,970	27	9,165	43	4,725	59	2,579	75	-

10) ELECTRICAL WIRING DIAGRAM:



C	ORANGE
A	AZURE
B	WHITE
L	BLUE
G	YELLOW
H	GREY
M	BROWN
N	BLACK
S	PINK
R	RED
V	GREEN
Z	VIOLET

N. B.: The hatched areas are componenst of the original wiring system

REF.	Q.TY	DESCRIPTION
1	1	Relay for evaporator electric fan MAX speed control
2	1	Relay for evaporator electric fan MEDIUM speed control
3	1	Relay for evaporator electric fan MIN speed control
4	1	Relay for condenser electric fan control
5	1	Relay for electromagnetic clutch control
6	1	Relay for heater solenoid valve control
7	1	Relay for DIN/REC air intake actuator control
8	1	Fuse 2 A electronic control unit protection
9	1	Digital control unit (cod. 20235092)
10	1	Inside air temperature sensor
11	1	DIN/REC air intake actuator
12	1	Evaporator electric fan
13	1	No frost thermostat
14	1	Condenser electric fan
15	1	Compressor electromagnetic clutch
16	1	Heater solenoid valve
17	1	Pressure switch

AUTOCLIMA QUALITY & COMFORT

11) DIMENSIONS AND ASSEMBLY INSTRUCTIONS: