OP7 control system
Programme for chambers with µPLC

Instruction Handbook

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1 WARNINGS

- The machine must only be used as described in this handbook.
- The machine must only be used by personnel who have read all the instructions contained in this handbook.

The concept of HUMIDITY always refers to Climatic Chambers. If the chamber is not a climatic chamber, you may ignore the relevant references.

**When a temperature grade is set (Centigrades per minute), it is unadvisable to set a humidity grade. The two quantities interfere with each other and therefore the temperature grade would be observed, whereas the humidity grade would not.**

The humidity grade should, therefore, be set only when the temperature is kept constant.

Please refer to the MOLLIER diagram to establish the test logic to be carried out for both temperature and humidity.

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>min:</th>
<th>+ 5°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>max:</td>
<td>+ 45°C</td>
<td></td>
</tr>
<tr>
<td>Relative humidity</td>
<td>RH</td>
<td>max: 80%</td>
</tr>
</tbody>
</table>

2 THE OP7 SYSTEM

2.1 DESCRIPTION

The system consists of a control panel equipped with a display, keyboard and function keys. This system enables temperature and humidity cycles to be carried out. The system can operate Manually or Automatically.

**Numerical keyboard**

**Function keys** (F2-F3-F4 not used)

**Display**

**Movement keys**

**To switch a function on/off**

**To enter or delete**

**Help on line**

**To confirm**

**To exit from a function** (and return to the selected page)

**To reset an alarm**

**To switch a function on/off**

**Alarm in process**

**HELP key warning light**

**SHIFT key warning light**

**Start/Stop**

This push-button may not be present according to the model of the machine.
The programmes set on the OP7 panel have to be memorised permanently in the MICRO PLC; if there is a black-out or if the machine is switched off, those programmes which have not been saved will be lost.

A specific guided procedure enables the relevant programmes to be both programmed and saved.

**OP7 Technical Specifications:**
- N° 10 memorisable programmes
- N° 99 segments for each programme
- N° 9999 programme repetitions
- N° 10 loops in each programme

Some of the displayed messages will differ from those shown here according to the machine version. In this case only remember the messages shown on your display. If any further instructions are necessary, they will be attached to this handbook.

### 2.2 KEY FUNCTIONS

**F1 CONTRAST**
- Place the cursor in this field.
- Digit a value.
- Press ENTER to confirm.

**LANGUAGE**
To change the language:
- Place the cursor in this field.
- Press
  - SHIFT
- Insert a password (100=default value)
- Press
  - SHIFT
  - to change the language
  - Press ENTER to confirm

(*) Up to version 0.0B. The language cannot be changed from version 0.0C onwards. The language used by the OP7 system is pre-programmed in the factory.

**K1 CYCLE ON/OFF**
- To switch on/off test cycle.
- Press the same key to switch the function on and off.

<table>
<thead>
<tr>
<th>Led light off</th>
<th>chamber switched off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed led light on</td>
<td>chamber in manual operation</td>
</tr>
<tr>
<td>Flashing led light</td>
<td>chamber in automatic operation</td>
</tr>
</tbody>
</table>

**K2 SET-UP**
- To set a temperature and relevant humidity value.

**K3 PROGRAMME SET-UP**

**K4 GENERAL SETTINGS**
- to set software alarms
- to set measurement parameters for external devices connected to the chamber.

To be used together with other keys. When this key is pressed, the “SHIFT” led light switches on.
To move from one line to another or from one page to another

To confirm a choice or a value that has been inserted.

To read alarm signals and to carry out the relevant reset.

To change a choice from ON to OFF and vice versa.

To exit from a page and to return to the preceding page. The function is switched on only if it is visualized on the page.

Insert a letter pinpointed by the cursor. The letters will then run from right to left.

If it is used together with SHIFT

To insert a space where the cursor is placed. The letters will then run from left to right.

In some software versions it gives help on line. When this function is switched on, the “HELP” led light switches on.

To insert a numerical value

To move from one line to another or from one page to another

2.3 BRIEF LIST OF THE MOST USED TERMINOLOGY

• Programme
  A set of instructions. The programme can be memorised in the main menu (Micro PLC) and then recalled in the work memory (OP7) in order to be carried out. A programme that has just be set can be carried out even if it has not been saved in the main menu. We advise you to always memorize your programmes in the main memory (MICRO PLC) so as to avoid accidental deletions.

• Cycle: a set of several segments.

• Segment
  Interval of time in which the required values that the chamber must carry out are set.

• Maintenance segment
  A segment in which the set temperature (°C) and/or relative humidity (RH%) values are kept constant for a certain period of time.

• Maximum speed segment
  A segment which is carried out at the highest possible speed.

• Controlled slope segment
  A segment in which the chamber must reach set point at the required speed (gradient).

• Gradient
  Speed at which a segment is carried out. It is expressed as a ratio between the unit of measurement and the time (°C/min.; RH%/min. etc...).

• Set-point
  The set value (temperature or relative humidity).

• Flag: Programme variables which may assume only two values or two different states (for example: 0 or 1; ON or OFF; OK or OFF; SAVE or OFF; etc...)

• Repetitions
  It enables an entire programme to be repeated automatically, starting from a specific segment. Up to 9999 repetitions of the entire programme may be carried out. When the machine is switched on, the default value is 1 and therefore the number of repetitions must always be reset. The operations included at this stage are not memorized and therefore the data have to be reinserted each time you wish to repeat a programme.
• **Loop table**
  This enables up to 10 repetitions of parts of a programme (series of segments or single segment) to be set. It is possible to carry out another nested loop within a loop; the former, however, must be part of the main loop.

• **Special and/or auxiliary contacts**
  To electrically switch on certain characteristic functions of the system as well as auxiliary contacts (external apparatus).

• **How to load a programme**
  Procedure to load a programme (already saved in the main memory) into the work memory (OP7). This procedure is always carried out before executing a programme.

• **How to save a programme**
  To memorize a programme permanently in the system’s main memory (Micro PLC).

• **Channel 1**
  Temperature channel.

• **Channel 2**
  Relative humidity channel.

• **Duration wait**
  ON: the segment is considered finished only when the set time has passed. After this period of time the programme moves on to the following segment, independently of the set temperature or humidity value.
  OFF: the segment is considered finished when the set time finishes, whether the set point has been reached or not.
  **NB:** The “Duration wait” and “Setpoint wait” flags must not both be turned OFF at the same time.

• **Control System**
  ON: the relevant channel (temperature, humidity, etc..) is controlled
  OFF: the relevant channel (temperature, humidity, etc...) is not controlled

• **Wait set-point**
  ON: the segment is considered terminated only when the pre-set set-point value (temperature or relative humidity) has been reached; the programme then moves on to the next segment.
  OFF: the segment is considered terminated at the end of the pre-set time, whether the set-point has been reached or not.
  **NB:** The ”Wait duration” and ”Wait set-point” flags should never both be switched off at the same time.

• **Maximum speed**
  ON: the set value (SET POINT) is reached at the highest possible speed.
  OFF: the programme considers the set gradient.

• **Near set**
  The tolerance within which the set point is considered to have been reached.
  A default value is memorized; this value should not be changed.
  In order for this indication to be effective while the programme is being carried out, the “Wait set-point” flag must be switched on (ON).

• **CTRL humid. spec.**
  ON/OFF: this option has been introduced in order to improve the performance of the system under certain work conditions. On the basis of the results obtained during a cycle, the user may experiment by changing this flag to see whether the chamber performance improves or not.

---

2.4 **START-UP**

• Use the main switch to turn on the machine.
  If the START/STOP switch is not held down, the following alarm message will appear:
• Press the START/STOP key.
• Use the ACK key to reset the alarm.
2.4.1 HOW TO SWITCH ON/OFF

A) By pressing key K1

B) By pressing the lighted START/STOP push-button

C) By switching off the main switch (isolating switch)

2.5 HOW TO SET THE SOFTWARE ALARMS

The instructions to start up the cycles in either MANUAL or AUTOMATIC mode will be given in the following chapters.

Never carry out a temperature cycle without having set the relevant software and hardware alarms.

The aim of these alarms is to protect the product which has to be tested in the case of temperature failures due to an accidental faulty operation.

Three alarm levels are usually available:

- Software alarms for maximum and minimum temperature (that can be set on the OP7 panel).
- Hardware alarms for maximum and minimum temperature (see chamber handbook).
- Fixed alarm for maximum temperature preset in the factory (see chamber handbook).

How to set the software alarm for maximum and minimum temperature

The alarms have to be defined after the minimum and maximum value for the cycle that is to be carried out have been defined. If the alarms are not programmed and they set off within the field of work, the cycle will be stopped and the relevant alarm will be triggered.

Press K4

followed by

- Overtemp
- Undert.

followed by

- Insert the relevant alarm values and confirm them with ENTER
- (ESC) if you do not wish to modify any data

Press K4 to switch off this function
2.6 OPERATIONAL DIAGRAM

Angelantoni Ind. Challenge 0.000

K1

K2

K3

K4

VISUALIZATION

MANUAL SETTING

GENERAL SETTINGS

CYCLE MENU

ESC

ESC

ESC

ESC

ESC

ESC

ESC

ESC

ESC

1

2

3

4

5

6

7

EDITA PROGRAMME

SAVES PROGRAMME

DELETES PROGRAMME

CURRENT PROGRAMME CHECK

CYCLE VISUALIZATION

LOOP TABLE

LOADS PROGRAMME

REPETITIONS
In order to make the following instructions easier to understand, examples with the relevant values will be given. Operations that can be carried out in manual mode:

### 3.1 HOW TO SET A VALUE
- Temperature value setting (e.g. 80°C)
- Humidity value setting (e.g. 70%)

The machine reaches the set value, at maximum speed, both when it rises and when it descends. Once the value has been reached, the machine will maintain this value.

### 3.2 HOW TO SET A CONTROLLED SLOPE
- Controlled temperature slope setting (Example 20 ÷ 35°C) with an average gradient of 1°C per minute and 60% relative humidity.
- Humidity setting from 60 to 90% with a gradient of 2% per minute.

(in order to calculate the average gradient, that is the temperature rise or descent speed, please refer to the technical data contained in the chamber instruction handbook).

**Steps to be carried out:**

3.2.1 **Step A:** follow the same procedure described in paragraph 3.1 so that the departure temperature in the chamber reaches 20°C in manual mode.

3.2.2 **Step B:** set the final value to 35°C and follow a slope with a gradient of 1°C/min. and 60% relative humidity.

The machine will reach the set temperature and humidity and will then maintain these values;

3.2.3 **Step C:** keep a constant temperature (35°C) and set the controlled RH humidity cycle (60÷90%) with a gradient of 2% per minute.

NB: if a mistaken gradient value is set, the machine will not follow the set slope but will still reach the final temperature and humidity.

---

### KEYS

| K2 | Settings |
| A1 | Temper. Set 0.00°C | Humid. Set 0.00% |
| A2 | Flashing cursor |
| A3 | Temp. gr. 80.00°C | Hum. gr. 0.00% |

**FUNCTIONS**
- Temperature values and other parameters are set on this page
- Flashing cursor
- To set the temperature (1)
- To set the humidity % (2)

**Notes:**
- See the temperature range in the chapter entitled “Technical specifications”
- See the humidity range in the chapter entitled “Technical specifications”

**ENTER** If you enter the wrong number, you will still have to press ENTER and then re-digit the number.
Imp. temp. 80.00°C
Imp. umid. 70.00%

Place the cursor as shown in order to set a humidity value %.
If the chamber is not climatic, leave the value at zero.

If you enter the wrong number, you will still have to press ENTER and then re-digit the number.

Temp. gr. 0.00°C min
Hum. gr. 0.00 RH%min

Temp. gr. = Temperature gradient (0=max speed)
Hum. gr. = Humidity gradient (0=max speed)

Data is entered and memorized as described previously.
The average gradient is given in the technical specifications in the chamber handbook.

Temperature enab OFF
Humidity enab. OFF

- To enable or disable the temperature
- To enable or disable the humidity

Temperature enab ON
Humidity enab. ON

- The temperature is enabled
- Move the cursor on to the line below and enable humidity

If you enter the wrong number, you will still have to press ENTER and then re-digit the number.

Dehumidification: OFF
Vibrator: OFF
Specimens: OFF
U.V. lamp.: OFF

1) The rising dehumidification (optional) avoids the formation of condensate on the object to be tested. The chamber must be originally equipped with this device.
2) Only for special machines equipped with Vibrator
3) When it is switched ON, contact E (Apparatus) is closed on the DIGITAL IN/OUT connector (see attached electrical diagram and description of the connector in the chamber instruction handbook).
4) Enables the UV lamp (optional) to be switched on.

In some versions of the programme the writing in points (1), (2), (3), (4) are replaced by:
Dedicated contact 1
Dedicated contact 2
Dedicated contact 3
Dedicated contact 4
Water recharge: OFF
Not used: OFF
Not used: OFF
SP. hum. CTRL OFF

1) When it is switched ON, the condensate water is recycled
When it is switched OFF, the condensate water is drained off.
2) Not used
3) Not used
4) When it is switched ON, the humidity slope can be controlled.

If you enter the wrong number, you will still have to press ENTER and then re-digit the number.

Aux 1: OFF
Aux 2: OFF
Aux 3: OFF
Aux 4: OFF

When it is switched ON, the ABCD contacts on the DIGITAL IN/OUT connector are closed (see attached electrical diagram and the description of the connector in the chamber instruction handbook).

If you enter the wrong number, you will still have to press ENTER and then re-digit the number.

Aux 5: OFF
Aux 6: OFF
Aux 7: OFF
Aux 8: OFF

When it is switched ON, the writing in points (1), (2), (3), are replaced by:

Dedicated contact 5
Dedicated contact 6
Dedicated contact 7

TEST START-UP

To switch off (led light switched off)

TO VISUALIZE
• To start the test
• The led light switches on the machine starts up and reaches the set temperature and humidity values: 20°C, 60% RH and remains in operation along these values.

Both the set rising and descending values are reached at maximum speed.

• Press

Data measured inside the chamber are visualized.

The chamber reaches these values and maintains them.
3.2 HOW TO SET A CONTROLLED SLOPE

- Setting of a controlled temperature slope (Example 20°÷35°C) with an average gradient of 1°C per minute and 60% relative humidity

- Setting of a humidity from 60 to 90% with a gradient of 2% per minute

( in order to calculate the average gradient, that is the temperature rise or descent speed, please refer to the technical data contained in the chamber instruction handbook).

We advise you not to carry out controlled temperature and humidity slopes (with a gradient) at the same time; in fact, the humidity slope would not be sufficiently controlled. When you carry out a humidity slope, make sure that the temperature is kept constant.

Operations:

3.2.1 Step A: follow the same procedure described in paragraph 3.1 so that the departure temperature in the chamber reaches 20°C in manual mode.

3.2.2 Step B: set a temperature slope from 20°C to 35°C and follow a slope with a gradient of 1°C/min.

The machine will reach the set temperature and humidity and will then maintain these values;

3.2.3 Step C: keep a constant temperature (35°C) and set the controlled humidity value (60÷90%) RH with a gradient of 2% per minute.

NB: if a mistaken gradient value is set, the machine will not follow the set slope but will still reach the final temperature and humidity.

3.2 STEP A.

Bring the chamber up to the departure temperature value of 20°C.

KEYS

DISPLAY

FUNCTIONS

The temperature values and other parameters are set on this page.

- For access to the page visualized on the display.
To set the temperature (1)
To set the humidity % (2)

(1) See the temperature range in the chapter entitled “Technical specifications”
(2) See the humidity range in the chapter entitled “Technical specifications”

Place the cursor as shown in order to set a temperature value.

Departure temperature

If you enter the wrong number, you will still have to press ENTER and then re-digit the number.

Warning! In order to reach the departure point, theses values must be set to zero (maximum speed).

Temp. gr. = Temperature gradient
Hum. gr. = Humidity gradient
(0=maximum speed)

- To enable or disable temperature control
- To enable or disable humidity control
- Temperature control is enabled

If you enter the wrong number, you will still have to press ENTER and then re-digit the number.
CYCLE START-UP

- Press this key to switch it off (led light switched off) K2

If the machine has stopped:

- Press this key to start the machine K1

VISUALIZED ON THE DISPLAY:
- The key led light is switched on.
- The machine starts, reaches the set temperature value (20°C) and continues to operate along this value.
- The set rising and descending value is reached at maximum speed.

- Press

The chamber internal data are visualized.

The chamber reaches these values and maintains them.

3.2 STEP B • Set a temperature slope from 20°C to 35°C with a gradient of 1°C/min and a 60% RH.

KEYS DISPLAY FUNCTIONS

- Wait for the chamber to reach the set departure value (20°C) (Step A).
- Follow the example to programme a temperature slope as shown in the diagram with the gradient that is indicated below.
- Move to the page shown below.

The previously set values are visualized

• Enter the values visualized on the display in the page shown on the right.

To confirm.
If you enter the wrong number, you will still have to press ENTER and then re-digit the number.
• Enter the temperature gradient but leave the humidity gradient at 0 for the time being.

If you enter the wrong number, you will still have to press ENTER and then re-digit the number.

- To enable or disable temperature control
- To enable or disable humidity control

If you enter the wrong number, you will still have to press ENTER and then re-digit the number.

- Ignore these data for the time being and move on to the next page.

Humidity slope control remains switched off.

To improve the performance of the system (experiment the setting)

• To switch off (led light switched off)

TO VISUALIZE ON THE DISPLAY
• The key led light is switched on
• The machine starts up and carries out the set temperature slope with a 60% RH humidity.
Once the set temperature values have been reached, the machine will continue along these values.

• Press

Internal chamber data are visualized.
3.2 STEP C  Set a controlled humidity slope from 60% to 90% with a gradient of 2%/min with a constant temperature and 60% RH humidity

- Wait for the chamber to reach the preset values, 35°C and 60% RH (Step A and Step B).

- Follow the example given to programme a temperature slope as shown in the diagram with the gradient indicated.

- Move to the next page.
- To enable or disable temperature control
- To enable or disable humidity control
- Temperature control is enabled. If you also wish to enable humidity control, move the cursor to the line below and use the same keys.

If you enter the wrong number, you will still have to press ENTER and then re-digit the number

- Ignore these data for the time being and move on to the next page

- To improve the performance of the system (experiment the setting)

- To switch off (led light switched off)

**TO VISUALIZE**

- The key led light is switched on the machine starts up and carries out the controlled humidity slope.
- Once the set temperature values have been reached, the machine will continue along these values.

- Press

```
  ▼
```

```
Internal chamber data are visualized.
```

```
  ▼
```

```
Temp. meas. 35 °C
Humid. meas. 90 %
```
4 AUTOMATIC OPERATION

In order to make the following instructions easier to understand, a temperature and humidity cycle will be carried out.

4.1 EXAMPLE CYCLE

In order to make the following instructions easier to understand, a temperature and humidity cycle will be carried out.

**Example graph of humidity control**

- RH: Relative Humidity
- Controlled humidity slope
- Ambient humidity
- Period of stabilization

**Example graph of temperature control**

- °C: Celsius
- Controlled temperature slope
- Ambient temperature
- Period of stabilization

**Point of loss of control of humidity (disable humidity)**

**Loop = repetition of segments 4,5,6,7**

**Example of how to operate AUX 1**

- **ON**
- **OFF**

OP2605-010

OP2605-015

4.1 EXAMPLE CYCLE
## 4.2 EXAMPLE CYCLE TABLE

<table>
<thead>
<tr>
<th>Segment n°</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>0:00</td>
<td>0:00</td>
<td>0:00</td>
<td>0:00</td>
<td>0:00</td>
<td>0:00</td>
<td>0:00</td>
<td>0:00</td>
<td>0:00</td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>Duration wait:</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td><strong>CHANNEL 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control:</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>Wait for set point</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>Max speed</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>Set point</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>55</td>
<td>55</td>
<td>30</td>
<td>30</td>
<td>95</td>
<td>95</td>
<td>110</td>
<td>110</td>
</tr>
<tr>
<td>Gradient</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.28</td>
<td>0.00</td>
<td>0.21</td>
<td>0.00</td>
<td>0.70</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Near set</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>CHANNEL 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control:</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Confirm progr.</td>
<td>OK</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
### 4.3 HOW TO SET A PROGRAMME

The cycle shown in the graph will be set as an example here below.

- Place the software alarms into position (paragraph 2.5)
- Place the hardware alarms into position (see machine handbook)

---

**KEYS** | **DISPLAY** | **FUNCTIONS**
--- | --- | ---

K3 | Cycles menu

B1 | This page is used to select the various functions to run the cycles and to start or stop a programme.

\[ \text{Program edit : (1)} \]
\[ \text{Loop table : (2)} \]
\[ \text{Save program : (3)} \]
\[ \text{Load program : (4)} \]

**B2**

- to set a programme
- to set a loop (§4.4)
- to save a programme (§4.5)
- to load a programme into the memory (§4.6)

\[ \text{Delete program : (5)} \]
\[ \text{Repetition : (6)} \]
\[ \text{Ver. curr. progr. : (7)} \]

**B3**

- to delete a programme already memorized (§4.7)
- to define the number of times a programme has to be repeated (§4.8)
- to visualize a set cycle (§4.9)

**B4**

- to select a function (from 1 to 7)
- to start or stop a programme

when it is switched ON, the current segment is visualized only while the cycle is being carried out

**B5**

To select option 1 “Edita programme”

EDIT PROGRAM
< ESC > Prev.menu
Segment N. 1

**B6**

- These data must not be set for the first segment:
- The first segment must be carried out at maximum speed.

- hh : mm : ss
- Durat. 0 : 0 : 0
- Wait duration : OFF

**B7**

- there are two channels for each segment:
- Channel 1: to set the temperature
- Channel 2: to set the humidity

When segment switch ON, it must be carry at the maximum speed

- when it is switched ON, temperature control is enabled
- when it is switched ON, it moves on to the next segment only when the set set point is reached.
  When it is switched OFF, it moves on to the next segment after the set time, whether the set value has been reached or not.
To set segment 1 (°C) Temperature 30°C
At maximum speed

Set point : 30.00 °C
Grad. : 0.00 °C/min
Near set : 1.00 °C

To set segment 1 (% RH) 60% humidity
At maximum speed

Set point : 60.00 RH %
Grad. : 0.00 RH %/min
Near set : 3.00 RH %

Enter the values shown on the page.

Default value (tolerance within which the segment is considered to have been reached)
1) The rising dehumidification (optional) avoids the formation of condensate on the object to be tested. The chamber must be equipped from the start with this device.

2) Only special machines equipped with vibrator

3) When it is switched to ON, contact E (Apparatus) on the DIGITAL IN/OUT connector is closed (see attached electrical diagram and the description of the connector in the chamber instruction handbook).

4) Enables the UV lamp (optional) to be switched on.

---

When it is switched to ON, the condensate water is recycled.

When it is switched to OFF, the condensate water is drained off.

To improve the performance of the system (experiment the setting)

---

When this page is shown, if the described operations have been carried out, the segment has already been saved. Do not, therefore, try to save it again.

Move on to the next step. DO NOT PRESS THE ▲ KEY OR ANY OTHER KEYS BEFORE THIS PAGE APPEARS, OTHERWISE THE SEGMENT WILL NOT BE SAVED.

Once the first segment has been finished, the entire procedure from page B5 to B20 has to be repeated. To simplify the explanations, we have given the following pages different numbers.

• Press repeatedly

EDIT PROGRAM
< ESC > Prev. menu
Segment N. 2

Wait for this number to appear

WARNING!
If you have accidentally saved the same segment twice, correct the number on this page.
To set segment 2 (°C)

Temperature 30°C
Duration 1h - Maintenance

- hh : mm : ss
  1 : 0 : 0
- Wait duration : ON

Channel 1
- Control : ON
- Wait set point : OFF
- Max speed : OFF
- Set point : 30.00 °C
- Grad. : 0.00 °C/min
- Near set : 1.00 °C

Because the same temperature value is maintained

To set segment 2 (% RH)

Humidity 60%
Duration 1h - Maintenance

- Control : ON
- Wait set point : OFF
- Max speed : OFF
- Set point : 60.00 RH %
- Grad. : 0.00 RH %/min
- Near set : 3.00 RH %

Because the same temperature value is maintained

Save segment : SAVE

This page is visualized

Save segment : OFF
Total segment : 0
Confirm progr : OFF

to save the programmed segment

When this page is visualized, if the previously described operations have been carried out, the segment has been saved and therefore must not be saved again. Move on to the next step.

• Press repeatedly

EDIT PROGRAM
< ESC > Prev. menu
Segment N. 3

Wait for this number to appear

WARNING!
If you have accidentally saved the same segment twice, correct the number on this page.
To set segment 3 (°C)  

Temperature 30°C  
Duration 2h - Maintenance

hh : mm : ss  
Durat.  2 : 0 : 0  
Wait duration : ON

Channel 1
Control : ON  
Wait set point : OFF  
Max speed : OFF

Set point : 30.00 °C  
Grad. : 0.00 °C/min  
Near set : 1,00 °C

Because the same temperature value is maintained

To set segment 3 (% RH)  

Humidity from 60% to 95%  
Duration 2h -slope-gradient 0.29 RH%/min

Channel 2
Control : ON  
Wait set point : OFF  
Max speed : OFF

Set point : 95.00 RH %  
Grad. : 0.29 RH%/min  
Near set : 3,00 RH %

Because the same temperature value is maintained

Water recharge: OFF  
Not used: OFF  
Not used: OFF  
SP. hum. CTRL. OFF

Save segment : SAVE

This page is visualized

Save segment : OFF  
Total segment : 0  
Confirm progr : OFF

When this page is visualized, if the previously described operations have been carried out, the segment has been saved and therefore must not be saved again. Move on to the next step.

• Press repeatedly EDIT PROGRAM  
< ESC > Prev. menu  
Segment N. 4

Wait for this number to appear.

WARNING!  
If you have accidentally saved the same segment twice, correct the number on this page.
**To set segment 4 (°C)**

**Temperature from 30°C to 55°C**  
**Duration 1.5h - slope - gradient 0,28°C/min**

- **hh : mm : ss**
- **Durat.** 1 : 30 : 0
- **Wait duration** : ON

**Channel 1**
- **Control** : ON
- **Wait set point** : ON
- **Max speed** : OFF

- **Set point** : 55.00 °C
- **Grad.** : 0.28 °C/min
- **Near set** : 1.00 °C

**To set segment 4 (% RH)**

**Humidity 95%**  
**Duration 1.5h - Maintenance**

**Channel 2**
- **Control** : ON
- **Wait set point** : OFF
- **Max speed** : OFF

- **Set point** : 95.00 RH %
- **Grad.** : 0.00 RH %/min
- **Near set** : 3.00 RH %

- **Water recharge**: OFF
- **Not used**: OFF
- **Not used**: OFF
- **SP. hum. CTRL.**: OFF

**Save segment**: SAVE

**This page is visualized**

**Save segment** : OFF  
**Total segment** : 0  
**Confirm progr** : OFF

- **Press repeatedly**

**EDIT PROGRAM**

< ESC > Prev. menu

**Segment N. 5**

- **Wait for this number to appear**

**WARNING!**

If you have accidentally saved the same segment twice, correct the number on this page.
To set segment 5 (°C)

**Temperature 55°C**
**Duration 2.5h - Maintenance**

- hh : mm : ss
- Durat. : 2 : 30 : 0
- Wait duration : OFF

**Channel 1**
- Control : ON
- Wait set point : ON
- Max speed : OFF

- Set point : 55.00 °C
- Grad. : 0.00 °C/min
- Near set : 1.00 °C

Because the same temperature value is maintained

To set segment 5 (% RH)

**Humidity from 95% to 90% and maintenance**
**Duration 2.5h - Maintenance**

**Channel 2**
- Control : ON
- Wait set point : OFF
- Max speed : OFF

- Set point : 90.00 RH %
- Grad. : 20.00 RH %/min
- Near set : 3.00 RH %

Unreal gradient which enables maximum speed to be obtained

Water recharge: OFF
Not used: OFF
SP. hum. CTRL. : ON

Aux 1: ON
Aux 2: OFF
Aux 3: OFF
Aux 4: OFF

Save segment : SAVE

To improve the system performance (experimentally set)

In this segment the AUX1 must be switched ON

When this page is visualized, if the previously described operations have been carried out, the segment has been saved and therefore must not be saved again. Move on to the next step.

Save segment : OFF
Total segment : 0
Confirm progr : OFF

To save the programmed segment

This page is visualized.

When this page is visualized, if the previously described operations have been carried out, the segment has been saved and therefore must not be saved again. Move on to the next step.

Press repeatedly

**EDIT PROGRAM**
- < ESC > Prev. menu
- Segment N. 6

Wait for this number to appear.

WARNING!
If you have accidentally saved the same segment twice, correct the number on this page.

26
To set segment 6 (°C)

Temperature from 55°C to 30°C
Duration 2h - slope - gradient 0.21°C/min

<table>
<thead>
<tr>
<th>Channel 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
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<td>Wait set point</td>
</tr>
<tr>
<td>Max speed</td>
</tr>
<tr>
<td>Set point</td>
</tr>
<tr>
<td>Grad.</td>
</tr>
<tr>
<td>Near set</td>
</tr>
</tbody>
</table>

To set segment 6 (% RH)

Humidity from 90% to 95% and maintenance
Duration 2h - Maintenance

<table>
<thead>
<tr>
<th>Channel 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
</tr>
<tr>
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<td>Max speed</td>
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<tr>
<td>Set point</td>
</tr>
<tr>
<td>Grad.</td>
</tr>
<tr>
<td>Near set</td>
</tr>
<tr>
<td>Water recharge:</td>
</tr>
<tr>
<td>Not used:</td>
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<tr>
<td>Not used:</td>
</tr>
<tr>
<td>SP. hum. CTRL.</td>
</tr>
<tr>
<td>Aux 1:</td>
</tr>
<tr>
<td>Aux 2:</td>
</tr>
<tr>
<td>Aux 3:</td>
</tr>
<tr>
<td>Aux 4:</td>
</tr>
</tbody>
</table>

Save segment: SAVE

This page is visualized.

When this page is visualized, if the previously described operations have been carried out, the segment has been saved and therefore must not be saved again. Move on to the next step.

Press repeatedly

EDIT PROGRAM
< ESC > Prev. menu
Segment N. 7

Wait for this number to appear

WARNING!
If you have accidentally saved the same segment twice, correct the number on this page.
To set segment 7 (°C)

Temperature 30°C
Duration 2h - Maintenance

hh : mm : ss
Durat.  2 : 00 : 0
Wait duration : ON

Channel 1
Control : ON
Wait set point : OFF
Max speed : OFF

Set point : 30.00 °C
Grad. : 0.00 °C/min
Near set : 1.00 °C

To set segment 7 (% RH)

Humidity from 95%
Duration 2h - Maintenance

Channel 2
Control : ON
Wait set point : OFF
Max speed : OFF

Set point : 95.00 RH %
Grad. : 0.00 RH%/min
Near set : 3.00 RH %

Water recharge: OFF
Not used: OFF
SP. hum. CTRL. : ON
Unreal gradient which enables maximum speed to be obtained

To save the programmed segment

Save segment : SAVE

When this page is visualized, if the previously described operations have been carried out, the segment has been saved and therefore must not be saved again. Move on to the next step.

• Press repeatedly

WAITING PROGRAM
< ESC > Prev. menu
Segment N. 8

WARNING!
If you have accidentally saved the same segment twice, correct the number on this page.

28
The following four segments are the same as 4,5,6,7 and therefore a repetition loop will be set later on. When segment 7 has been programmed, the procedure will pass on to segments 8,9,10,11 and then a repetition loop will be inserted.

To set segment 8 \( (^\circ C) \)

**Temperature from 30\(^\circ C\) to 95\(^\circ C\)**

Duration 1.5h - slope - gradient 0.70\(^\circ C/min\)

Segment 8, from 30\(^\circ C\) to 110\(^\circ C\) is divided into 3 segments (8,9,10 as humidity must be switched off at 95\(^\circ C\))

- \( hh : mm : ss \)
- Durat. \( 1 : 30 : 0 \)
- Wait duration \( ON \)

**Channel 1**

- Control \( ON \)
- Wait set point \( OFF \)
- Max speed \( OFF \)

- Set point \( 95.00 \ ^\circ C \)
- Grad. \( 0.70 \ ^\circ C/min \)
- Near set \( 1.00 \ ^\circ C \)

Because the same temperature value is maintained

Unreal gradient which enables maximum speed to be obtained

To improve the system performance (experimentally set)

To save the programmed segment

**To set segment 8 (% RH)**

Humidity 95%

Duration 2,h - Maintenance

**Channel 2**

- Control \( ON \)
- Wait set point \( ON \)
- Max speed \( OFF \)

- Set point \( 95.00 \ %\ RH \)
- Grad. \( 0.00 \ %/min \)
- Near set \( 3.00 \ %\ RH \)

Unreal gradient which enables maximum speed to be obtained

To improve the system performance (experimentally set)

To save the programmed segment

When this page is visualized, if the previously described operations have been carried out, the segment has been saved and therefore must not be saved again.

Move on to the next step.

• Press repeatedly

Wait for this number to appear

WARNING!

If you have accidentally saved the same segment twice, correct the number on this page.
When the temperature reaches 95°C, humidity control must be switched off, so a very short segment (9) has to be carried out that lasts only a few seconds (e.g. 5 secs.)

To set segment 9 (°C)

Temperature 95°C
Duration 5 secs - Maintenance

hh : mm : ss
Durat. 0 : 0 : 5
Wait duration : ON

Channel 1
Control : ON
Wait set point : OFF
Max speed : OFF

Set point : 95.00 °C
Grad. : 0.00 °C/min
Near set : 1,00 °C

Because the same temperature value is maintained

To set segment 9 (% RH)

Humidity 95% (switch off humidity)

Channel 2
Control : OFF
Wait set point : OFF
Max speed : OFF

Set point : 95.00 RH %
Grad. : 0.00 RH %/min
Near set : 3,00 RH %

Water recharge: OFF
Not used: OFF
Not used: OFF
SP. hum. CTRL. ON

This data as well as the following data will be ignored as the humidity control has been switched off.

Because the same temperature value is maintained

To switch off humidity control

Save segment : SAVE
to save the programmed segment

When this page is visualized, if the previously described operations have been carried out, the segment has been saved and therefore must not be saved again. Move on to the next step.

This page is visualized

Save segment : OFF
Total segment : 0
Confirm progr : OFF

• Press repeatedly EDIT PROGRAM
< ESC > Prev. menu
Segment N. 10 Wait for this number to appear.

WARNING!
If you have accidentally saved the same segment twice, correct the number on this page.
To set segment 10 (°C)

Temperature from 95°C to 110°C
Maximum speed

To carry out the segment at maximum speed

Channel 1
Control: ON
Wait set point: ON
Max speed: ON

Set point: 110.00 °C
Grad.: 0.00 °C/min
Near set: 1,00 °C

To set segment 10 (% RH)

Humidity - - - - not controlled

Leave everything switched OFF as humidity is not controlled in this temperature range

Save segment : SAVE
to save the programmed segment

This page is visualized

Save segment : OFF
Total segment : 0
Confirm progr : OFF

• Press repeatedly

EDIT PROGRAM
< ESC > Prev. menu
Segment N. 11

Wait for this number to appear.

WARNING!
If you have accidentally saved the same segment twice, correct the number on this page.
To set segment 11 (°C)

- Temperature 110°C
- Maximum speed: Duration 1.5h - Maintenance
- Duration: hh : mm : ss
  - 1 : 30 : 0
- Wait duration: ON
- Channel 1
  - Control: ON
  - Wait set point: ON
  - Max speed: OFF
- Set point: 110.00 °C
- Grad.: 0.00 °C/min
- Near set: 1.00 °C

Because it is being maintained

To set segment 11 (% RH)

Humidity - - - not controlled

- Save segment: SAVE

This page is visualized

- Save segment: OFF
- Total segment: 11
- Confirm progr: OK

When this page is visualized, if the previously described operations have been carried out, the segment has been saved and therefore must not be saved again. Move on to the next step.
4.4 LOOP TABLE

To set a LOOP

How to set the LOOP, a repetition of segments 4,5,6,7

This enables up to 10 repetitions of parts of a programme (series of segments or single segment) to be set.

It is possible to carry out another nested loop within a loop; this, however, must form part of the main loop.

E.g. Loop of segments 4,5,6,7 (see diagram on the right)

Execution: 4,5,6,7
Nested loop 5,6
Execution: 4,5,6,5,6,7, 4,5,6,5,6,7

Move on to page 01

Cycles Menu

Program edit : (1)
Loop table : (2)
Save program : (3)
Load program : (4)

Delete program : (5)
Ripetition : (6)
Ver. curr. progr. : (7)

Choice

Start progr. STOP
Monitoring : OFF

LOOP page

Loop Table
< ESC > menu prec.

Loop 1
From (<) : _ _ _
To (>) : _ _ _
Loops : _ _ _

First loop segment (always lower than the following number)
Last loop segment (always higher than the preceding number)
Number of times the loop has to be executed

Digit the data shown and confirm them with Enter

Loop 1
From (<) : 4
To (>) : 7
Loops : 2

The set segments (page O6) are carried out twice

It is now possible:
To save the programme (paragraph 4.5)
To carry out the programme even if it has not been saved (paragraph 4.6).
4.5 HOW TO SAVE A PROGRAMME

It is extremely important to save the programme in the main memory (MICRO PLC) in order to avoid accidental deletions due to blackouts or to the machine being switched off.

Cycles Menu

Program edit : (1)
Loop table : (2)
Save program : (3)
Load program : (4)
Delete program : (5)
Ripetition : (6)
Ver. curr. progr. : (7)

Choice

Start progr. STOP
Monitoring : OFF

SAVE PROGRAM
< ESC > Prev. menu

Current program will be saved
on position N° : _ _ 1 (‘)
Save program OFF

The programme is saved

(*) 10 programmes can be saved in the main memory (Micro PLC)
The number of the first free position in the memory is visualized in this field; the programme can, in fact, only be saved in the first free position. Make a note of the position in which the programme was saved. If there are no free positions, this message will flash.
The LOOP table will be saved together with the programme.

Flash eprom full
<ESC> To exit

Proceed as follows:

ESC to exit from this page

Move on to paragraph 4.8 “HOW TO DELETE A PROGRAMME”
4.6 HOW TO LOAD AND CARRY OUT A PROGRAMME

- The programme to be carried out must always be present in the work memory (OP7).
- If the programme is not present in the work memory (OP7), it will have to be loaded from the MICRO PLC according to the following procedure.

Move on to the page shown on the right as follows:
- “ESC” key if you have been programming and you want to carry out the cycle that is still inside the memory
- Key “K3” if you were carrying out other functions

• The programme to be carried out must always be present in the work memory (OP7).
• If the programme is not present in the work memory (OP7), it will have to be loaded from the MICRO PLC according to the following procedure.

Move on to the page shown on the right as follows:
- “ESC” key if you have been programming and you want to carry out the cycle that is still inside the memory
- Key “K3” if you were carrying out other functions

**Cycles Menu**

**Program edit :** (1)
**Loop table :** (2)
**Save program :** (3)
**Load program :** (4)

**Delete program :** (5)
**Ripetition :** (6)
**Ver. curr. progr. :** (7)

**Choice**

**Start progr. STOP**
**Monitoring :** OFF

**LOAD PROGRAM**
**< ESC > Prev. menu**

**Program to load**
**Load program**

(*) if the selected position does not contain a programme, the following flashing message will appear

Position empty

<ENTER> to exit

(Keep a note of the saved programmes)

**THE PROGRAMME IS CARRIED OUT**

in order to visualize the programme during its execution, please refer to paragraph 4.10.
4.7 HOW TO DELETE A PROGRAMME

- A programme to be deleted can be removed from the MICRO PLC memory as follows:

**MICRO PLC**

**OP7 RAM work memory**

### Cycles Menu

- Program edit: (1)
- Loop table: (2)
- Save program: (3)
- Load program: (4)

### Delete Program

- Delete program: (5)
- Ripetition: (6)
- Ver. curr. progr.: (7)

### Choice

- Start progr.: STOP
- Monitoring: OFF

#### DELETE PROGRAM

- First pos. free
- Prog. to delete
- Delete progr.

This indicates the first free position in the memory

Programme to be deleted

If you wish to move a programme from one position to another, first save the programme in the new position and then delete the programme from its old position.

**To delete, for example, programme N° 4:**

DELE

Programme to be deleted

DELE

Move the cursor and then

**THE PROGRAMME WILL BE DELETED**
4.8 REPETITIONS (HOW TO REPEAT A PROGRAMME)

- An entire programme can be repeated automatically, starting from a specific programme. **NB: The first segment must always be carried out at maximum speed.**

- Up to 9999 repetitions of the entire programme may be carried out. When the machine is switched on, the default value is 1 and therefore the number of repetitions must always be reset.

- The operations included at this stage are not memorized and therefore the data have to be reinserted each time you wish to repeat a programme.

The following operations must be carried out with the machine switched off.

Switch off the machine by carrying out the steps described in the box.

In order to start up the machine again, please refer to paragraph 4.6.
4.9 HOW TO CHECK A PROGRAMME

This option enables one or more segments of the programme being loaded into the memory to be checked.

The data in the memory cannot be modified at this stage.

To visualize all the options for the selected segment

Press several times
4.10 HOW TO VISUALIZE A PROGRAMME

This option enables the state of the chamber to be visualized during execution of the cycle.

- Load the programme (see § 4.6)

To visualize the state of all the programme options being carried out

- Temp. meas. __________ °C
- Humid. meas. __________ %
- Temp. set __________ °C
- Humid. set __________ %
- Temp. gr. __________ °C min
- Hum. gr __________ RH % min
Dehumidification: __
Vibrator: __
Specimens: __
U.V. lamp: __

Water recharge: __
Not used: __
Not used: __
SP. hum. CTRL.: __

Aux 1: __
Aux 2: __
Aux 3: __
Aux 4: __

Aux 5: __
Aux 6: __
Aux 7: __
Aux 8: __

Program mode: __
N° of segments: __
Init. segment: __
Current segment: __

Total repetit: __
Curr. tot. repeat: __
Time from init. cycle:
  hh: mm: ss
  ___: ___: ___
Time from init. segm.:
  hh: mm: ss
  ___: ___: ___

Time to end segment:
  hh: mm: ss
  ___: ___: ___

This indicates whether the chamber is carrying out a cycle (ON) or not (OFF)
Total number of set segments
Number of the segment starting the cycle that the chamber is carrying out
Current number of the segment of the cycle that the chamber has reached.
Number of cycle repetitions the chamber has to carry out
Current number of cycle repetitions (that the chamber has carried out)
Time that has passed from the beginning of the current cycle
Time that has passed from the beginning of the current segment

Time still has to pass before the end of the current segment (only for maintenance segments, for the other types of segments the value is always equal to 0).
The time is indicated in hours: minutes: seconds of the cycle or the segment.
4.11 HOW TO VISUALIZE USER ANALOG INPUTS

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>V10</td>
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<td>V12</td>
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</tr>
</tbody>
</table>

4.12 HOW TO VISUALIZE USER PT100

<table>
<thead>
<tr>
<th></th>
<th>PT100-1:</th>
<th></th>
<th>PT100-2:</th>
<th></th>
<th>PT100-3:</th>
<th></th>
<th>PT100-4:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>V13</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

User device 1 voltage
Corresponding value 1 for the user

Temperature measurement by user probe
The following instructions refer to machines equipped with special connectors or analog IN/OUT sockets. They may be controlled by devices such as PT100 probes or proportional signals.

5.1 USER ANALOG INPUT CONFIGURATION (FROM 1 TO 6)

Enter the values for input 1
E.G.
Min. value inp. 1
Max. value inp. 1
Min. value mon 1
Max. value mon 1

In the example shown on the left a sensor to measure the air speed has been inserted.
A speed of 0 m/sec. is associated with the value 0 mV.
A speed of 20 m/sec. is associated with the value 10000 mV.

When the input is measured, the sensor will supply a voltage of 5000 mV, at which point the speed shown will be 10 m/sec.
### ALARMS

**WARNING!**

Each time an operation is carried out to eliminate an alarm, a RESET must be carried out by pressing the ACK key on the OP7 operator panel.

If the cause of the alarm has not been eliminated, the message on the display will disappear, whereas the led light showing that an alarm has been triggered remains switched on.

<table>
<thead>
<tr>
<th>MESSAGE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>START SWITCH OFF ALARM</strong></td>
<td>- Switch on the START switch</td>
</tr>
<tr>
<td><strong>POWER SUPPLY LACK ALARM</strong></td>
<td>- Check that the mains supply is available</td>
</tr>
<tr>
<td>(only for chambers equipped with a UPS no-break power group)</td>
<td></td>
</tr>
<tr>
<td><strong>SAFETY THERMOSTAT ALARM</strong></td>
<td>- Contact your technical assistance service</td>
</tr>
<tr>
<td><strong>WATER LACK ALARM</strong></td>
<td>- Reset humidification water supply</td>
</tr>
<tr>
<td><strong>SERVICE MAX TEMPERATURE ALARM</strong></td>
<td>- Contact your technical assistance service</td>
</tr>
<tr>
<td><strong>THERMAL PROTECTION HIGH STAGE COMPRESSOR ALARM</strong></td>
<td>- Contact your technical assistance service</td>
</tr>
<tr>
<td><strong>THERMAL PROTECTION LOW STAGE COMPRESSOR ALARM</strong></td>
<td>- Contact your technical assistance service</td>
</tr>
<tr>
<td><strong>MAX PRESSURE HIGH STAGE COMPRESSOR ALARM</strong></td>
<td>- Contact your technical assistance service</td>
</tr>
<tr>
<td><strong>MAX PRESSURE LOW STAGE COMPRESSOR ALARM</strong></td>
<td>- Contact your technical assistance service</td>
</tr>
<tr>
<td><strong>MIN USER TEMPERATURE ALARM</strong></td>
<td>- Check the value set on the minimum thermostat (it must be higher than the set-point).</td>
</tr>
<tr>
<td><strong>MAX USER TEMPERATURE ALARM</strong></td>
<td>- Check the value set on the maximum thermostat (it must be higher than the set-point).</td>
</tr>
<tr>
<td><strong>MOTOR PROTECTION ALARM</strong></td>
<td>- Reset the magnetothermal switch that has triggered off; if another alarm sets off, contact the ANGELANTONI Industrie SpA technical assistance service.</td>
</tr>
<tr>
<td><strong>NOT AVAILABLE IN PROGRAMME MODE</strong></td>
<td>- The K2 key has been pressed during an automatic running of a programme. Press K2 (the led light will switch off).</td>
</tr>
</tbody>
</table>

Some of the displayed messages will differ from those shown here according to the machine version. In this case only remember the messages shown on your display. If any further instructions are necessary, they will be attached to this handbook.