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Cooling incubator
with controlled humidity

CLIMACELL 111, 222, 404, 707

Operating instructions



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1 General notes

The unit CLIMACELL should be used in applications, in which changing the temperature in a sample in range from 0 °C to 99.9 °C and the relative humidity (RH) from 10 % to 95 % in various time modes is needed.

CLIMACELL may be used in several ways, so please, read this manual carefully.

MMM's cooling incubators CLIMACELL are equipped with a microprocessor control with the following features:

1. Fuzzy-logic temperature controller and a thermo-sensor PT 100.
2. Humidity control by PID regulator with *fuzzy logic* and a *humidity capacity sensor*.
3. 4 preset programs P1 to P4, 2 programs P5 and P6 to set containing up to 16 steps.
4. Electronic timer with different time modes, see description of programs (page 10).
5. Adjustable fan speed from 0 to 100 % in 10 %-steps.
6. Printing the protocol with real temperature and time values via interface RS 232 C.
7. Chip card reader to store data P1 to P4, P5, P6 and to record to the memory .
8. Foil covered touch buttons for easy programming.
9. 32 digit LCD display, illuminated. All parameters seen at once. (To your information, the display is already set up to be used in product ranges coming out in future.)

CLIMACELL is manufactured of high grade materials with the latest technology and is subjected to strict final tests leaving the plant. The inner chamber housing as well as the shelves are made of stainless steel. The coating is water based, gray on top of galvanized zinc coated sheet metal, safe for the environment.

2 Important instructions

2.1 Unpacking and check

After unpacking the unit, please, check, whether the unit and its facilities are complete and undamaged.

An eventual damage must be immediately reported to the transporting company.

During the manipulation – in case of lifting the cabinet etc. – the cabinet cannot be hold by the rail or door. The cabinets of volumes 404 and 707 should be lifted by means of delivered hooks, the rolls are designed for local moving, not for longer transport.

The standard delivery consists of the temperature cabinet,

two sieves,

one chip card SO for setting the safety thermostat,

three chip cards for storing the set programs

hose for connecting the input water

(order No.: 0671574),

hose for outlet of the waste water

(order No.: S461200),

dish for collecting the condensate

2.2 Before putting into operation

CLIMACELL is designed and produced in accordance with EN 50081-1, 55011, 50082-2, 61000-4-2, 61000-4-4, ENV 50140, 50141, meets requirements of EU directions 89/336/EEC, 73/23/EEC, and is individually tested according to EN 61010-1.

- ◆  **Before starting the work with this unit please study the instructions for use carefully!**
- ◆  Lay the treated material only on the sieves in the unit, never on the bottom of the chamber!
- ◆  Carrying capacity of the floor, where the unit will be placed, must correspond to the weight of the unit itself plus the weight of the maximum charge (see chapter **Technical parameters**).
- ◆  The unit must not be placed on a floor covering, which could cause a danger of fire or smothering in case of falling of hot objects out of the unit.
- ◆  **No inflammable, explosive or toxic stuff or materials which could give such stuff off may be inserted into the units!**
- ◆  Unit is not designed for warming of liquids.
- ◆  Units are not designed for using in atmosphere with danger of inflammable or explosive anaesthetics.
- ◆  **Every mounting and demounting of the unit's parts may be carried out only after disconnecting the unit from the mains by pulling the supply cord out of the socket.**
- ◆ Installation of the unit is carried out by connecting to the mains and connecting to the water source and the drain. Parameters of the electric connections are specified in chapter **Electric installation and other conditions**.
- ◆  If the unit is not used for a longer time, disconnect it from the mains by pulling the connecting cord out of the socket.
- ◆  The mains cord must not come into contact with hot parts of the unit
- ◆  Protection of the temperature cabinet, its surroundings and the treated material from surpassing the temperature is secured by a safety thermostat. The unit **CLIMACELL has a safety thermostat class 3 according to EN 61010-2-010**.
- ◆  Check the function of the safety thermostat regularly – every day (see paragraph Check of the function of the safety thermostat).
- ◆  The types of cabinets are: standing on the floor, space saving, equipped with rolls and a brake. It is necessary, that the cooling incubator stands on an even floor. Otherwise the unit's run could be influenced negatively.
- ◆  Minimum distance of the rear and side wall of the unit from other objects and walls is 100 mm, from the upper wall it is 400 mm.

- ◆  Shifting the upper sheet of the inner chamber out and in must be carried out carefully, there is a danger of cutting the chamber seal through as a consequence of careless manipulation.
- ◆  If the unit operates with a temperature higher than 70°C, take a special care when opening the door. As there is the set RH kept in the chamber, hot steam is generated, which can cause a scald.
- ◆  As Climacell is connected to water supply and drain, place the unit in a room with its floor sloping towards the drain.

2.3 Permitted loads:

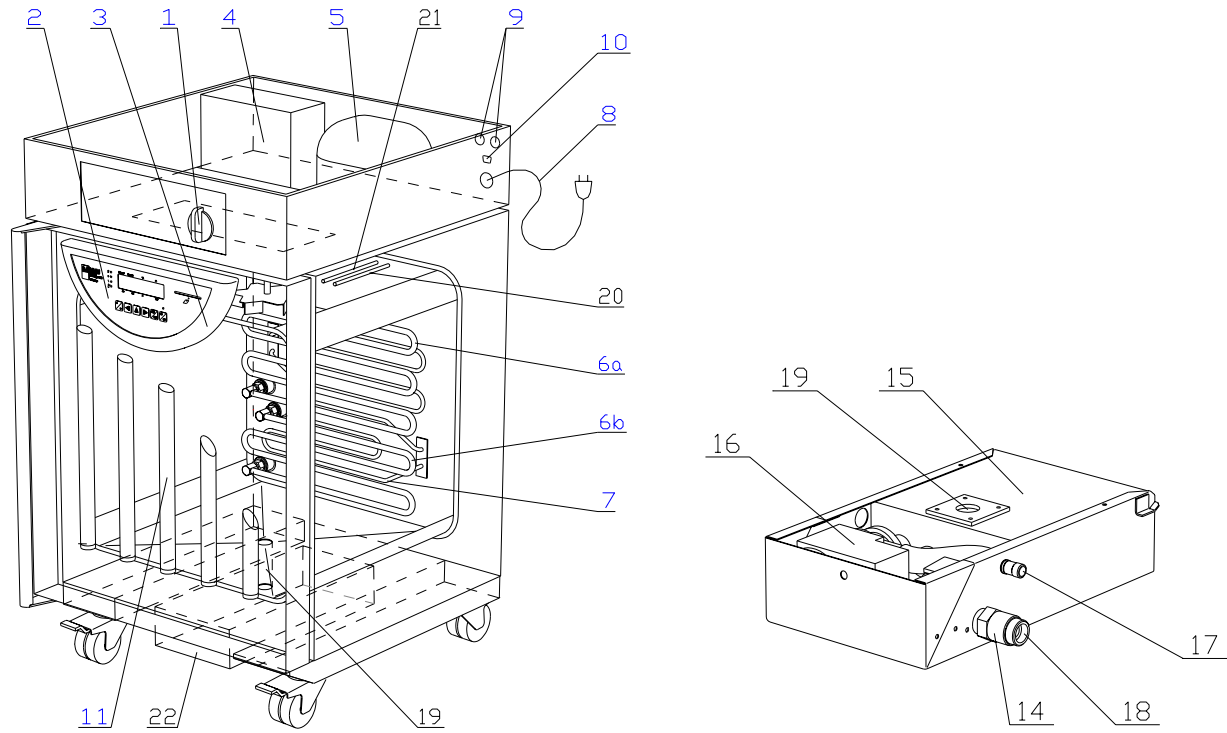
size	weight [kg]/tray	total weight [kg]
55	20	50
111	20	50
222	30	70
404	30	100
707	50	130

2.4 Wiring and other conditions

- overvoltage category: II
- protection : IP 20 according to EN 60 529
- power supply: 230 V, ± 10 %
- degree of grounding : 2 according to IEC 664
- ambient temperature: 4 to 40 °C
- relative humidity: 80 % at 31 °C, 50 % at 40 °C
- use: interior rooms
- separation of external circuits double isolation, the circuits are separated from the mains by a safety transformer tested for the voltage 2300 V

3 Specifications of the cooling incubator with controlled humidity

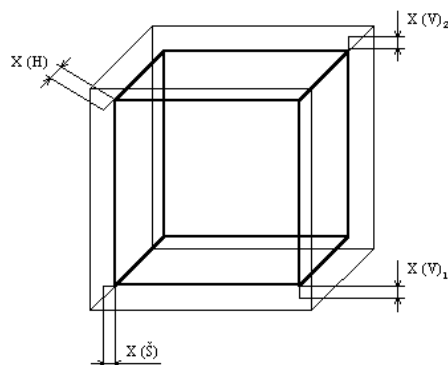
3.1 General view



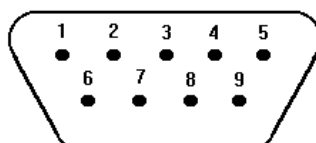
1	Mains switch	12	Quick coupler – ring for disconnecting
2	Control panel	13	Quick coupler – part I
3	Plastic body of the regulator	14	Unit of the magnetic treatment of input water from the distribution system
4	Condenser	15	Boiling vessel for steam generator
5	Compressor (coolant R134a)	16	Pump
6	Cooling snakelike tubing – 6a, 6b	17	Drain of waste water
7	Heating bodies in the heating space	18	Input of pressure water of the distribution from the vessel with distilled water
8	Mains connector. 230V, 50 Hz	19	Interconnection of the generator and the chamber (with sealing)
9	Fuses, F 10 A, 250 V, Ø 5 x 20 mm	20	Sensor PT 100
10	Interface for printing the protocol (RS 232C)	21	Relative humidity sensor
11	Exposure lighting in the door – option	22	Set of the steam generator

3.1.1 Useful space

Useful space - see the illustration. in the following picture, where $X(H) = X(D) = 10\%$ of the chamber depth, $X(\check{S}) = X(W) = 10\%$ of the chamber width, $X(V)_1 = X(H)$ = distance of the bottom shelf to the bottom of the chamber. The required temperature accuracy from the par. Technical parameters can be only achieved within the space defined above (according to DIN 12 880 – marked with heavy lines in the picture, the light lines mark the inner walls of the chamber). (It means that over the highest shelf the values of the chapter Technical parameters are not obligatory).



3.2 Connector RS-232C for protocol printer



Pin	Signal
2	TxD
3	RxD
5	GND
6	DSR

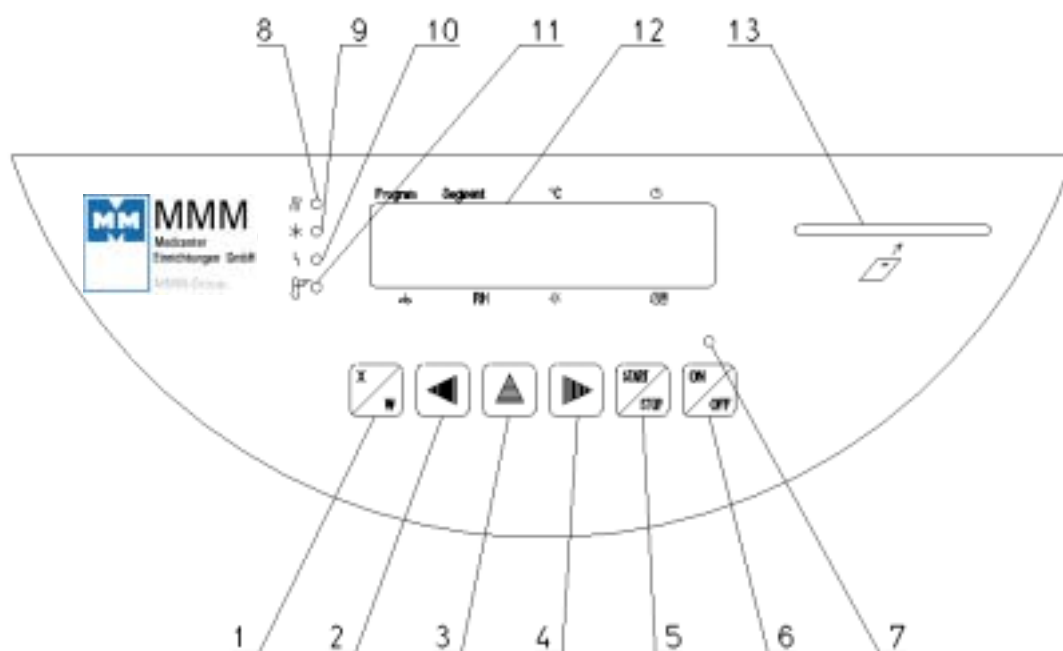
Interface parameters

Baud: 4800
 Stopbit: 1
 Parity: none
 Databit: 8

Devices connected with of connector RS 232 must fulfill valid regulations and be approved by a competent testing laboratory.

The unit is designed for connecting to printer CITIZEN, model iDP 3110-24 RF-A, which can be ordered optionally.

3.3 Operating panel



- 1 key of activation of setting-up mode
 - 2/4 cursor steering turning to the left/right
 - 3 setting-up value in parameter
 - 5 key starting the program
 - 6 switch (ON - on, OFF - stand by)
 - 7 indicator light - shines after switching on the switch
 - 8 indicator light heating - shines: state of temperature regulator - heating active
 - 9 indicator light cooling - shines: state of temperature regulator - cooling active
 - 10 indicator light – failure
 - 11 indicator light of safety thermostat - shines: temperature surpassed the limit set on the safety thermostat - heating is off / see paragraph **4.1.8 Set safety thermostat**
 - 12 Display
 - 13 port for inserting the chip card
- Segment: partial or full graphic representation of the program coarse
 Segment : l'affichage graphique du parcours du programme partiel ou total
- °C: temperature display
 ⌚: process time
 ⚙: fan speed display in % (steps of 10 %)
 RH – relative humidity
 ☀ - setting-up intensity of exposition light in the door
 56 - positions are used for specific purposes - see descriptions in text

4 Function and operating

Function of individual indicator lamps and control keys is described in chapter **Description of the unit** in paragraph **Control panel**.

4.1 Connecting to the water source and drain

- a) the water source is a plastic container (ca. 50 l) with a submersible pump, filled with distilled water

Unpack the container and:

- connect the cable connector to the corresponding socket in the rear part of the upper piece (side piece) of Climacell,
- connect the hose to the steam generator (which is placed outside the unit at the bottom) by means of the inner thread hose coupling to the container .
- Fill the container with distilled water. Climacell is ready for operation.

- b) the water source is a drinking water piping (Ca content is max. 50 mg/l), permissible water pressure is in the range from 0.1 to 1 MPa

By means of the supplied plastic hose connect CLIMACELL to the common water piping in following way: screw one screw joint to the inlet pipe, which leads from the steam generator, and the other screw joint to the water piping outlet. There is a unit of magnetic water treatment placed on the steam generator inlet pipe ; the treatment suppresses forming of mineral deposits inside the generator. Fix one end of the supplied outlet hose to the outlet pipe, before which the waste water pump is placed, and tighten it with a tape, lead the other end to a basin or directly to the drain. Taking the connection of Climacell to the water and drain into consideration, it is recommended to place Climacell in a room with a floor sloping towards the drain.

Caution!

In both cases a) and b) the hose of the water supply or discharge from the steam generator must not be bent, throttled or cranked so that water cannot flow.

4.2 Connecting to the electric network:

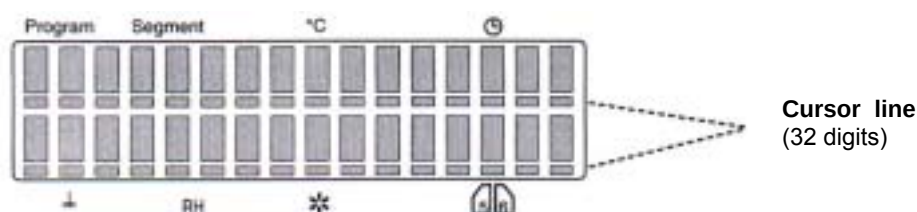
Compare the nominal voltage and power input values, which you can find on the product plate, with the power supply. If the supply parameters comply with the unit's parameters, connect the plug to the supply socket.

4.3 Switch the unit on:

Set the mains switch, which is placed on the panel of exceeding port, to the I position. Press

the  , (the control light above the switch comes on), display comes on and the device is ready for running. Continue the procedure as follows.

LCD shows all parameters for your convenience at once. Cursor is placed below all 32 digits of LCD in a so called cursor line and is always placed only below one of the digits



Parameter change:

Move the cursor horizontally by pressing ◀▶ . Change the parameter above the cursor by pressing ▲ .

4.4 General setup of CLIMACELL

CLIMACELL – MMM' s product – offers a wide range of customer's benefits. In order to make them active, there are fundamental inputs required. To achieve this the following service mode containing 7 different services is here.

4.4.1 Activating the service mode

Press simultaneously buttons ▲▶ for 2 seconds. LCD shows Service 01. By pressing the button ▲ you can change between the single service modes Service 01 – Service 08.

4.4.2 Service 01 – Storing P1 – P4, or P5, or P6 to chip card

With help of this service you can store programs P1 – P4, or P5, or P6 on the MMM s chip card. Before storing the parameters to the chip card it necessary to insert the right card to the unit panel. These cards can be ordered optionally.

Make sure that the chip card is in the card reader!

Press START/STOP to do storing. The transmission is confirmed by the read out „Done“ on LCD. Press START/STOP again to enter another service. If the read out on the LCD is „Bad MMM CCard“, check the chip card and repeat the procedure.

Pressing START/STOP enter the program storing service at first.

The choices P1 – P4, or P5 or P6 are available. Select by pressing ▲ .

To store the program press button .

(In detail: *Before the start:* the display indicates: „Service 01“

„Save to CCard“

After the start: on the second line of the display by pressing ▲ select what will be saved on the chip card. Choices

- all eligible parameters of P1 to P4 at once - the display indicates:

„P1÷4 →MMM CCard“,

- all eligible parameters of P5 - the display indicates:

„P5→MMM CCard“,

- all eligible parameters of P6 - the display indicates:

„P6→MMM CCard“.

The storing of your choice on the chip card is done by pressing . If an incorrect card is placed into the unit, the display indicates: „Bad MMM CCard“. If everything is all right, the indication is: „Done“.)

Quit the service by pressing START/STOP again.

4.4.3 Service 02 – Restore/upload the programs from the chip card to the unit

With help of this service you can record the programs P1 – P4, or P5, or P6 stored on the chip card again to the unit's memory (see 3.1.2). The programs in the memory will be recorded over (erased). Make sure the chip card is in the card reader. Press START/STOP to record. The transmission is confirmed by the read out „Done“ on LCD. Press START/STOP again to enter another service. If the read out on the LCD is „Bad MMM CCard“, check the chip card and repeat the procedure.

The procedure is as follows: By pressing START/STOP you enter the program restoring service at first. The choices P1 – P6 are available. Select by pressing ▲. To record the program press button .

(In detail: *Before the start*: the display indicates: „Service 02“
„Load from CCard“

After the start: on the second line of the display by pressing ▲ select what will loaded from the chip card. Choices:

- all eligible parameters of P1 to P4 at once - the display indicates:

„MMM CCard→P1÷4“,

- all eligible parameters of P5 - the display indicates:

„MMM CCard → P5“,

- all eligible parameters of P6 - the display indicates:

„MMM CCard →P6“.

The loading of your choice from the chip card is done by pressing . If an incorrect card is placed into the unit, the display indicates: “Bad MMM CCard“. If everything is all right, the indication is: “Done“.)

Quit the service by pressing START/STOP again.

Caution!

Use only an original chip card delivered by the producer. Using of another card could cause damaging of your unit's regulator and the guarantee would be cancelled.

4.4.4 Service 03 – Set the real time and date

Pressing START/STOP you enter the service. Set the real time and date by pressing buttons ◀▶ and ▲. To quit the service press START/STOP again. Data on the display are in the following form: ho:mi_day:month:year

4.4.5 Service 04 – Set interval on printer/communication interface

To print protocols device can be set up (optional) with a printer CITIZEN iDP 3110-24 RF-A, which is connected by a cable to the printer interface – see par. Printing the protocol. Enter the service by START/STOP and set the interval:

Pressing ▲ select one of the following choices:

printer off

switched over to PC (application of SW DS Com – data are sent to PC)

interval 10 s

interval 01 min

interval 01 h

By pressing ◀ move the cursor to the position 10/01 seconds, minutes or hours. By pressing ▲ you can change the printer interval within the following range:

10 to 50 s (step 10 s)

01 to 59 min (step 1 min)

01 to 12 h (step 1 h)

To quit the service press START/STOP again.

Caution!

Only one unit is active, either seconds, minutes, or hours!

4.4.6 Service 05 – Select language

Pressing START/STOP you enter the service. To select the language use button ▲ . To quit the service press START/STOP again.

4.4.7 Service 06 – Setting the switching time of the inner socket (optional)

With help of this service you can set the time of the inner socket periodic switching on and off. Press START/STOP to enter the service.

On the bottom line of LCD there is a read out:

„on: XXPP off: YYQQ“, where

XX is the number of time units during which the socket is on for a part of a period (00 – 99)

YY is the number of time units during which the socket is off for a part of a period (00-99)

PP time units for switching on (min or hr)

QQ time units for switching off (min or hr)

Move the cursor by pressing ◀▶ change the number of the time units or unit by pressing ▲

If XX = 00, the socket will never be on, if XX ≠ 00 and YY = 00, the socket is on all the time after the start.

4.4.8 Service 07 - Setting the safety thermostat

The safety thermostat serves for safety of the temperature cabinet, its surroundings and the treated material from suppressing the set temperature or from the temperature drop below the set limit (i.e. prevents damaging or destroying the material samples in case of damaging the temperature regulator or in case of an unintentional setting the chamber temperature higher- or lower-, than the appropriate sample is able to endure).

By pressing START/STOP enter the service.

On the lower line of the display –

at the position 9, 10 (symbols ZZ on display) – set the by you selected lower temperature limit (adjustable in the range from –5 °C to +39 °C),

at the position 12, 13, 14 (symbols XXX on the display) – set the upper temperature limit (adjustable in the range from 0 °C to +199 °C),

(minimal deviation from the set regulated temperature is ± 5 °C),

at the position 16 (symbol Y on the display) set the safety thermostat type 3 – complies with class 3 according to EN 61010 (i.e. in case of suppressing the set temperature in the chamber the thermostat will switch the heating bodies off, the control light *safety thermostat* switches on, the acoustic alarm starts up, the report on the display “Safety Thermost.” is altered with the previous date, the unit does not heat, even if the control light *heating* lights. After the drop of the temperature in the chamber under the set safety thermostat limit goes the unit on with the operation – for example the heating is switched on. The control light *safety thermostat* switches off, the acoustic alarm is still active and the report on the display “Safety Thermost.” is altered with the data about actual state – these two data can be cancelled by pressing START/STOP. Similar events – in a mirror symmetrical form- occur in case of a temperature drop below the lower temperature limit, cooling is switched off instead of heating.)

Insert the chip card SO into the reading unit on the control panel and confirm the setting of temperature and thermostat type by pressing . Take the chip card SO off.

Quit the service by another pressing START/STOP.

Note: If a program is started, whose set temperature is outside the limits given by setting the safety thermostat, the display reports error 05 – error of setting the safety thermostat.

Check of the safety thermostat function is described in chapter Function of safety thermostats.

4.4.9 Service 08 – Selecting the water quality

Enter the service by pressing START/STOP. On the upper line of the display: „Water Quality“

On the lower line switch over by pressing ▲: either „Tap Water“ or „Distilled Water“. Conform the setting by pressing START/STOP and quit the service 08.

4.4.10 Service 09 – Canceling the service regime

Cancel the service regime by pressing START /STOP. Now you can select and start the programs.

4.4.11 Setting the lighting – type with door lighting

Programs **P1 to P4, P5, P6** – type with dimmer

Concerning extension of following chapters:

Setting the program P1

Setting the program P2

Setting the program P3

Setting the program P4 – segment T1

Setting the program P4 – segment T2

Description of the program P5 and its control

Description of the program P6 and its control

By pressing ◀▶ place the cursor to the position ☀ and by pressing ▲ select the lighting.

P1 to P4: after reaching the set temperature in the just adjusted horizontal segment – or at P3 also at the time delayed period – there is possible to set the illumination at steps of 10% of maximum illumination. 0% (totally off) is at display shown as „OFF“, 100% is shown as „ON“. The illumination is constant during the whole time as the segment continues.

P5, P6: there is possible to set the illumination at steps of 10 % of maximum illumination at every (horizontal or cross) segment. 0% (totally off) is at display shown as „OFF“, 100 % is shown as „ON“. The illumination is constant during the whole time as the segment continues. The reference value of illumination (when 100 % and 22 °C is set) on the level of the entry into the chamber (in the middle of the entry area) – measured with the luxmeter sensor perpendicularly towards the impinging rays, white day light: CLC 111: 6000 lx ± 5 %, CLC 222: 10 000 lx ± 5 %, CLC 404 and 707: 13 000 lx ± 5 %

4.4.12 Setting the relative humidity in programs P1 – P4

During the setting of temperature and time in the given horizontal segment set the required value of relative humidity in 1 %-steps in the range of RH between 10 % and 95 % at the position of RH on the lower line of the display – with limitations given in diagram in paragraph **Setting the operating conditions of temperature and relative humidity and their limitations.**

Rise to the set RH starts after reaching the set temperature.

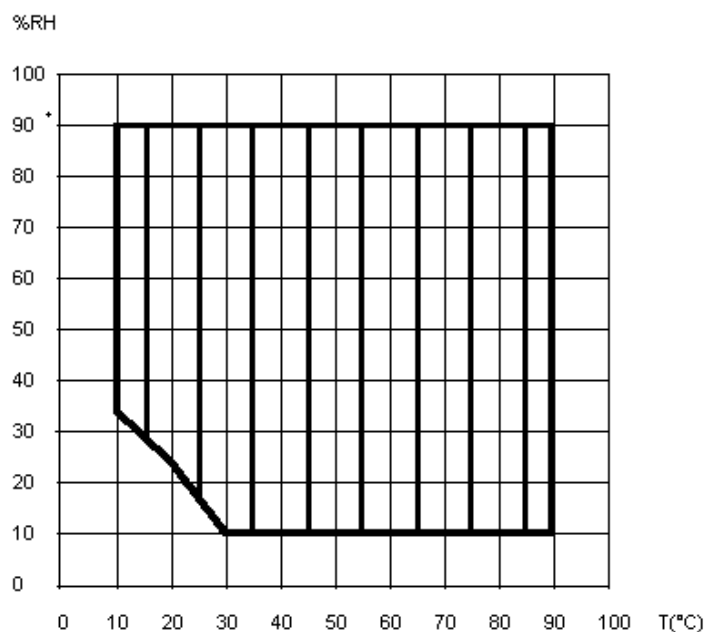
Notice:

Switch off the RH regulation during the run of the program with the already set RH value according to the following example: If the cabinet operates e.g. at 20 °C and 86 % RH,

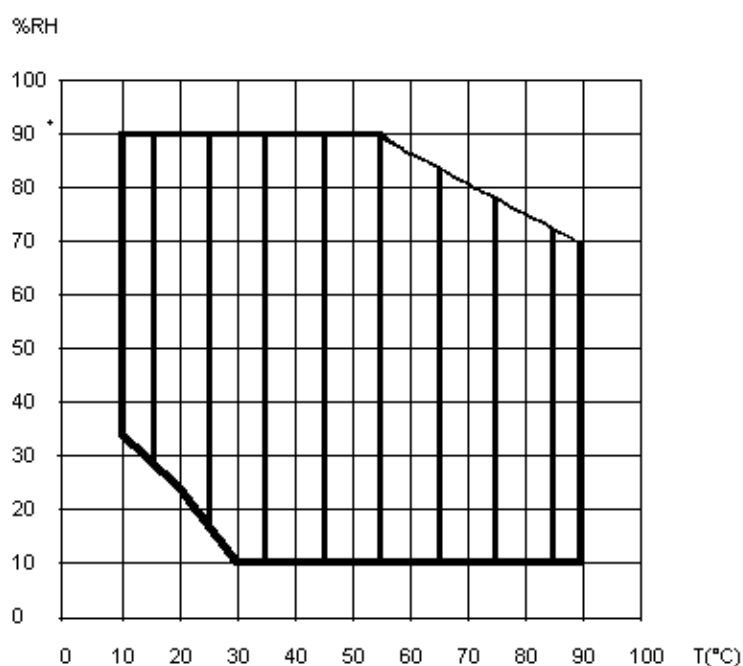
depress X/W and put the cursor to the position of RH units, set 9, go to the position of RH tens and set the further value over 9 – this position is OFF.

4.4.13 Setting the operating conditions of temperature and relative humidity and their limitations

Relation between the operating temperature (T °C) and the operating relative humidity (RH %) in setting the operating parameters of the cabinet is shown by the enclosed diagram. The hatched surface is limiting the area of achievable operating parameters.



If the cabinet is supplied with the door lighting, a different diagram is valid, see hereafter:



4.5 Program P1

A constant temperature and a constant value of RH is required.

P 1 = 

The cabinet is working fluently at the set temperature and RH until the unit is switched off.

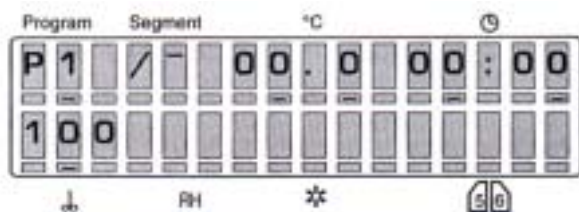
4.5.1 Set P1

Put cursor to the position Program with help of ◀▶ and switch to P1 with help of ▲
Set the temperature at the position °C between 0 and 99.9 °C in steps 0.1 °C Place the cursor on the lower line of the display and set the ventilator rate at the position  to a value from 00 % to 100 % in 10 %-steps (% of maximum rate) and RH between 10 % and 90 % with limitations given in diagram in paragraph **Setting the operating conditions of temperature and relative humidity and their limitations**.

CAUTION!

Do not reduce the ventilator rate if not necessary. The reduced ventilator rate could influence the regulation of temperature and RH negatively!

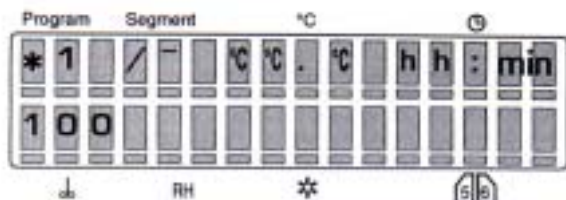
4.5.2 LCD read out shown



4.5.3 Start P1

Press START/STOP, a sound will appear and the “windmill” in the first digit of LCD starts running clockwise.

See the following LCD read out:



Digit 1 (windmill running) = program running

Digit 7 to 10 = actual temperature in °C.

Digit 12 to 16 = time from the start in hr:min.

As soon as the set values are reached, then run down time is shown.

4.5.4 Information on the set parameters during the device's running:

Press  and all information on the set parameters are shown at once. All possible parameters in all possible programs can be set including the one which is presently active, as long as the change is effective.

4.5.5 Stop program P1

Press START/STOP again.

4.6 Program P2

At first the set temperature is reached, the set time starts to be counted and the rise of RH to the set value starts at the same time. After the end of the operation the heating and other active functions are switched off.

P 2 = 

The unit operates at the set temperature and RH till the expiration of set time (max. 99h 59 min).

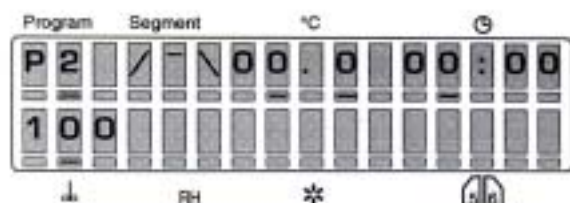
4.6.1 Set P2

With help of buttons ◀ ▶ put the cursor to the position Program and switch to the program P2. Set the temperature at the position °C. Move the cursor to the position ⌚ and set the run down time between 00hr:00min to 99hr 59min. Set the ventilator rate at the position  to a value from 00 % to 100 % in 10 %-steps (% of maximum rate) and RH between 10 % and 90 % with limitations given in diagram in paragraph **Setting the operating conditions of temperature and relative humidity and their limitations**.

CAUTION!

Do not reduce the ventilator rate if not necessary. The reduced ventilator rate could influence the regulation of temperature and RH negatively!

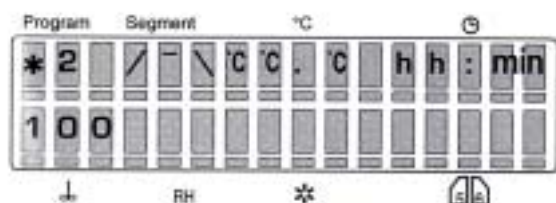
4.6.2 LCD - read out shown:



4.6.3 Start P2

Press START/STOP, a sound will appear and the “windmill” in the first digit of LCD starts running clockwise.

See the following LCD read out:



°C °C °C = actual temperature

hh:mm = time to reach the set temperature, if the set-up is reached, the rest of the run down time is indicated.

4.6.4 Information on the set parameters during device's running:

See paragraph 4.5.4

4.6.5 Stop P2

Press START/STOP

4.7 Program P3

The delayed start begins after the defined run down time has been reached.

[The function starts CLIMACELL for example at the weekend. Thus your goods are ready on the first day of return to work.]

P 3 =

The device starts running after the delayed time has run down (max. 99 hr 59 min) and the unit operates at the set temperature. The duration of the set temperature can be limited or unlimited in time.

4.7.1 Setting the program P3

By means of ◀▶ set the cursor to the position Program and come over to the program P3. By means of ◀▶ place the cursor in the graph to the segment 1, by which the segment is activated (eventually change the position of the cursor by means of ▲).

Set the time of delayed start 00 min to 99 h 59 min in the fields ⌚.

By means of ◀▶ place the cursor in the graph and by means of ▲ switch over to the second segment of the graph

Set the temperature in the fields °C. Place the cursor to the position ☼ and set the time of operation between 00h:00min to 99 h 59 min or unlimited ∞:∞.(set the infinity in the following way: set 99 h, put the cursor to the nine in units and depress ▲)Place the cursor to the

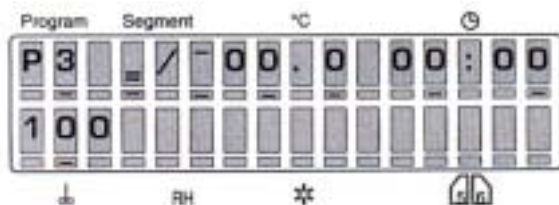
position ⚙ and set the ventilator rate between 00 to 100 %, then set the required relative humidity between 10 % and 90 % at the position RH – with limitations given in diagram in

paragraph **Setting the operating conditions of temperature and relative humidity and their limitations.**

Caution!

Do not reduce the ventilator rate if not necessary. The reduced ventilator rate could influence the regulation of temperature and RH negatively!

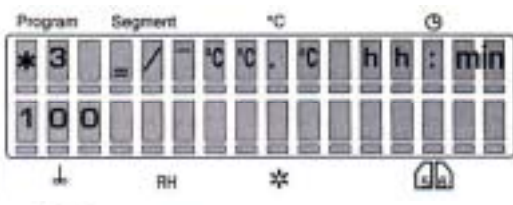
4.7.2 LCD - read out shown:



4.7.3 Start P3

Press START/STOP, a sound will appear and the “windmill” in the first digit of LCD starts running clockwise. See the following LCD read out:

4.7.3.1 P3 and segment 1 in the graph are active.

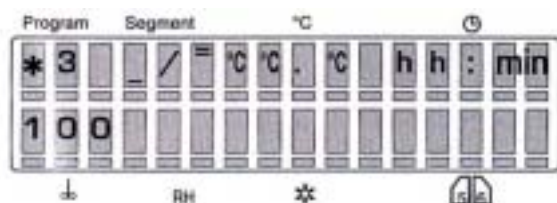


$_ / _$ = segment 1

hh:mm = the programmed time, counting down towards zero.

°C °C °C = actual temperature

4.7.3.2 P3 and segment 2 in the graph are active, the segment 1 is over



$_ / _$ = segment 2

hh:mm = time running from the start till the set temperature has been reached.

°C °C °C = actual temperature

After the set temperature has been reached, the run down time is shown if the time of the procedure is unlimited. If the time is limited, the rest of the run down time is shown.

4.7.4 Information on the set parameters during the device's running:

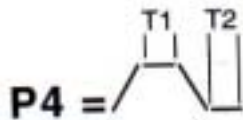
See paragraph 4.2.4

4.7.5 Stop P3

Press START/STOP.

4.8 Program P4

With two temperature levels T1 and T2, with controlled rate of temperature variation (ramps), with setting the RH for each temperature level and with cycling option.



Operates at 2 temperature levels T1 and T2, the dwell time on the level T1 is limited, on the level T2 can be limited or unlimited.

4.8.1 Set P4

Index: T0 = initial chamber temperature

T1 = temperature level 1

T2 = temperature level 2

Digit 11 on LCD, placed between temperature and dwell time values, shows the following information:

r = ramp value, can be set on digits 12 – 16

and corresponds with temperature change speed in °C/min

max. value is +3.20 °C/min, when T0 < T1

max. value is –1.0 °C/min, when T0 > T1

If r = 00.0, no ramp active!

(Variations of maximum ramp rates by different temperatures may appear due to physical limits of heating power.)

t = time available in position ☉ (00h:00min – 99 h 59 min), at T2 the dwell time can be unlimited

c = cycles shown in position ☉, digits 12 – 13 on LCD (available only at T2, if the dwell time is unlimited)

Possible number of cycles is 02 to 99 (eventually ∞ - which is the next position after 99 - the cycling is possible on condition, that the temperature drops below the value T0 after the end of interval on T2)

4.8.2 Set the segment for T1

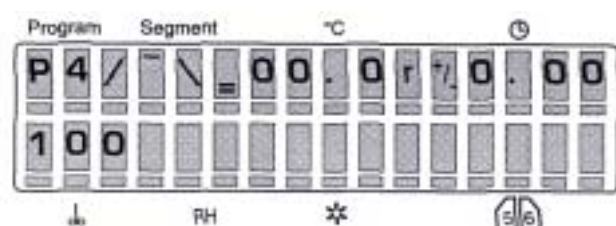
4.8.2.1 Set temperature T1

Put cursor to the position Program and switch to P4. By pressing ◀▶ place the cursor on the graph and make sure that T1 (/ _) is activated. If not, activate it with button ▲. Change to the position °C - setting the temperature - and set the temperature between.

4.8.2.2 Set the delay time of T1 :

Move cursor to the digit 11 on LCD and ask for parameters by pressing ▲ Either „r“ or „t“ will appear (see above). Select „t“. Move to the position ⌚ and set the dwell time between 00 hr:00 min and 99 hr 59 min.

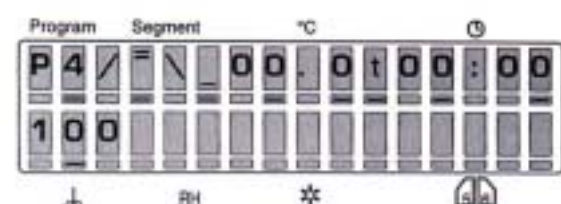
4.8.2.3 Read out of T1 and the delay time:



4.8.2.4 Set the ramp at T1 :

Return the cursor to the digit 11 on LCD and by pressing ▲ select „r“. Switch to the position ⌚ and set the required ramp (max. value +3.20 °C/min for T0 < T1). If the ramp is not needed, leave „r“ on 0.00. In this case the temperature will be changed at maximum speed. The symbol ± appears automatically in accordance to T0 and T1 relation.

4.8.2.5 Read out of T1 and the ramp:



4.8.2.6 Set the fan speed at the temperature T1:

Place the cursor at the position ⌚ and set the ventilator rate between 00 to 100 %. Then set the required relative humidity between 10 % and 90 % at the position RH – with limitations given in diagram in paragraph **Setting the operating conditions of temperature and relative humidity and their limitations.**

Caution!

Do not reduce the ventilator rate if not necessary. The reduced ventilator rate could influence the regulation of temperature and RH negatively!

4.8.3 Set the temperature T2 :

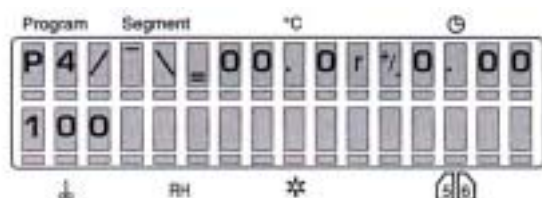
4.8.3.1 Set the temperature T2 :

Place the cursor on the graph and make sure that T2 (/ \ ____) is activated. If not, activate with help of ▲. Change to the position °C – setting of the temperature – and set the temperature.

4.8.3.2 Set the delay time of T2

Put the cursor on the digit 11 on LCD and ask for parameters by pressing ▲ Either „t“ or „r“ or „c“ will appear. Select „t“. Enter the position ⊕ and set the delay time between 00hr:00min and 99 hr 59 min, or unlimited ∞:∞.(set the infinity in the following way: set 99 h, put the cursor to the nine in units and depress ▲)

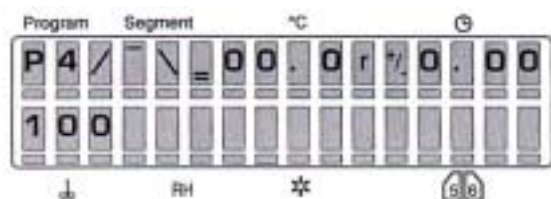
4.8.3.3 Read out of T2 and the delay time:



4.8.3.4 Set the ramp at T2:

Return the cursor to the digit 11 on LCD and by pressing button ▲ select „r“. Switch to position ⊕ and set the required ramp (max. value +3.20 °C/min for T1 < T2). If the ramp is not needed, leave „r“ on 0.00. In this case the temperature will be changed at maximum speed. The symbol ± appears automatically in accordance to T1 and T2 relation.

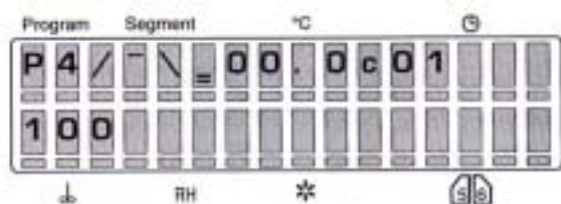
4.8.3.5 Read out of T2 and the ramp:



4.8.3.6 Set cycles for P4:

Return the cursor to the digit 11 on LCD and with ▲ select „c“. Switch to the position ⊕ set the number of cycles between 02 and 99(eventually ∞ - which is the next position after 99). The number of cycles means, how many times will the cycle run, i.e. value 03 means, that at the end of the first cycle will be the whole process still twice repeated. Cycles will not be used in case „c“ is not on LCD in the moment of start.

4.8.3.7 Read out of cycles for P4:



4.8.3.8 Setting the ventilator rate and RH at the temperature T2:

Place the cursor at the position  and set the ventilator rate between 00 to 100 %. Then set the required relative humidity between 10 % and 90 % at the position RH – with limitations given in diagram in paragraph **Setting the operating conditions of temperature and relative humidity and their limitations**.

Caution!

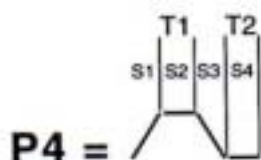
Do not reduce the ventilator rate if not necessary. The reduced ventilator rate could influence the regulation of temperature and RH negatively!

4.8.4 Start P4:

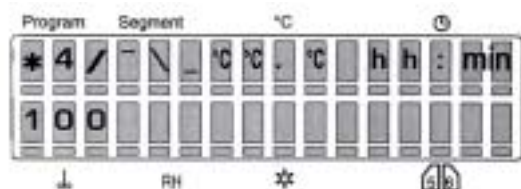
Caution!

If cycling is required, „c“ must be on LCD when starting the program.

Press START/STOP, a sound will appear and the “windmill” in the first digit of LCD starts running clockwise. See the following LCD read out:
The graph shows the actual state of the program



4.8.4.1 S1 is active, temperature is heading towards T1:

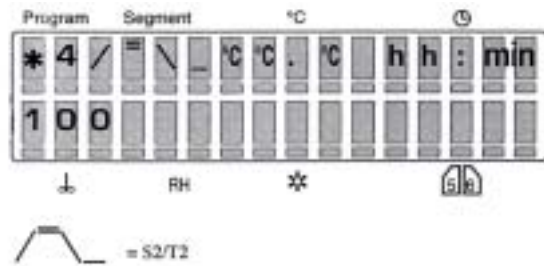


 = S1

°C °C °C = actual temperature

hh:mm = time since start to reaching T1

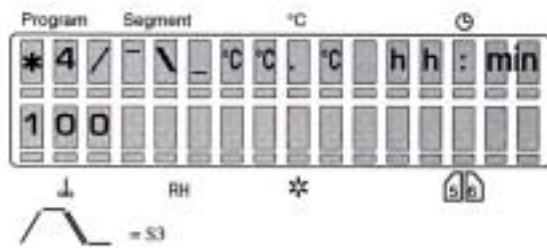
4.8.4.2 S2 is active, T1 has been reached, delay time is running:



°C °C °C = actual temperature

hh:mm = dwell time at T1 running down towards zero

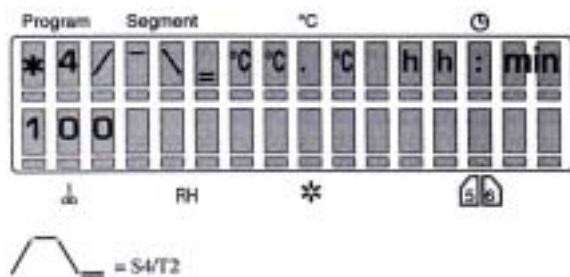
4.8.4.3 S3 is active, temperature is heading towards T2:



°C °C °C = actual temperature

hr:min = time running since the end of T1 till it reaches T2

4.8.4.4 S4 is active, T2 is reached, delay time at T2 is running:



°C °C °C = actual temperature

hh:mm = in case the time of the procedure is unlimited the time of running is shown, in case of the limited time the rest of this time is shown

4.8.5 Information on the set parameters during the device's running:

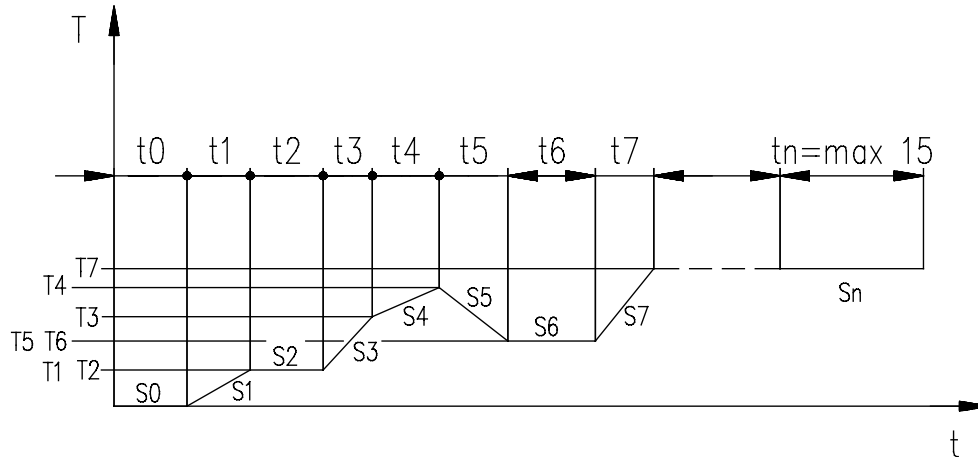
See paragraph 4.2

4.8.6 Stop P4

Press START/STOP.

4.9 Program P5, P6

4.9.1 Description of P5 and its control



The program consists of 16 segments. Segment 0 is for the delayed start, it is defined only by the time t_0 . If t_0 is 0, there is no delayed start. Segments 1 to 15 are of the same qualities, each of them is defined only by the end temperature, time or speed (ramp), fan rotation speed and depending on the type of the unit also by relative humidity and chamber light.

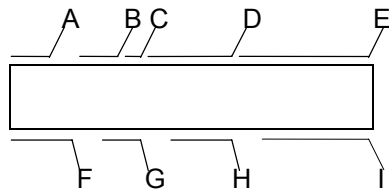
Each of the segments **S1** to **S15** can be set as the last and the infinite, that is after the end temperature T_i has been reached, and simultaneously after the time t_i is over either the program is finished or followed by another cycle.

Each of the segments 1 to 15 can be set as the last and infinite, that is the program at this segment must be finished by START/STOP button.

If the cycle selection is active on LCD at the moment of the start, see fig. Display - state of the program selection - E: cXX, the program comes again to the start after the last segment is over and the whole program is repeated. The definite number of program cycles corresponds with the number behind the letter "c". The segment 0 can be counted into the cycle as well even when it is zero. The rise to the set RH starts after reaching the set temperature.

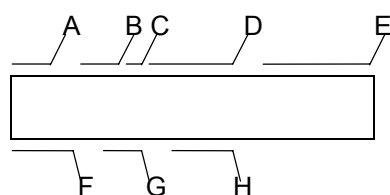
Range of parameters:

time	t_0	0 hr, 0min to 99hr 59 min
time	t_1 to t_{15}	0 hr, 0 min. to 99 hr, 59 min., or infinite
ramp	r_1 to r_{15}	0 to 3.2 °C/min for heating -1.0 to 0 °C for cooling
temperature	T_1 to T_{15}	0,0 to 99,9 °C
fan speed	V_1 to V_{15}	0 to 100% with 10% steps
relative humidity	RH_1 to RH_{15}	10 % to 90 % with 1 %
light	L_1 to L_{15}	ON/OFF (only for the type CLC-L)
number of cycles	C	2 to 99 (eventually ∞ - which is the next position after 99)

Display - state of the program selection

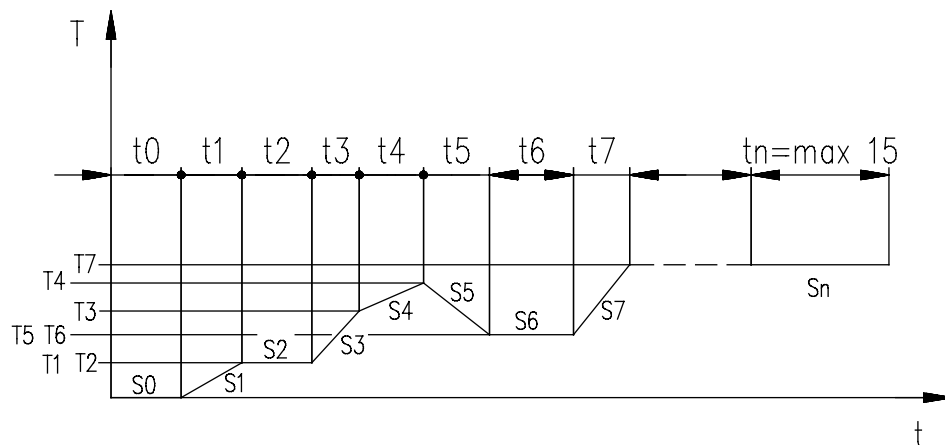
- A: P5 name of the program
 B: XX number of the set segment
 C: X type of the set segment:
 x time of the zero segment is set to zero, segment will be skipped over
 > not the last, the end length - see E
 >I the last, the end length - see E
 ∞ the last, infinite length
 D: XX . X required temperature of the set segment (! the end temp.)
 E: tXX : XX required length of the set segment, deciding is the ramp or
 TXX : XX required length of the set segment, deciding is the time
 r±X . XX the ramp = required speed of the set segment, deciding is the time or
 R±X .XX the ramp = required speed of the set segment, deciding is the ramp or
 cXX the number of cycles of the whole program
 F: XXX the fan speed of the set segment
 G: XX disengaged
 H: XXX the light of the set segment
 I: XX . XX the month and day at the moment (impossible to be set in P5)

Display - running of the program



- A: * 5 the rotating symbol and the program number
 B: XX the number of the relevant segment
 C: X the type of the set segment:
 > not the last, the end length - see E
 >I the last, the end length - see E
 ∞ the last, infinite length
 D: XX . X the temperature in the chamber at the moment
 E: XX : XX the segment time at the moment - hours, minutes
 all segments - counting down from the set value towards zero,
 in case of an infinite length of the last segment counting up from zero
 in case the time is higher than 99 hr. 59 min >>:>> is indicated
 F: XXX the fan speed at the moment
 G: XX disengaged
 H: XXX the light at the moment

4.9.2 Description of P6 and its control



The program consists of 16 segments. Segment 0 represents delayed start, it is determined only by the time t_0 . If a sign "x" is in the display C, then there is no delayed start. Segments 1 to 15 have the same functions, each of them is determined by the end temperature, time or rise rate (ramp), ventilator rate, relative humidity RH and according to the unit type also by the exposure lighting of the chamber.

Each of the segments S_1 to S_{15} can be set as the last, that is after the end temperature T_i has been reached, and simultaneously after the time t_i is over either the program is finished or followed by another cycle.

Each of the segments 1 to 15 can be set as the last and infinite, that is the program at this segment must be finished by START/STOP button.

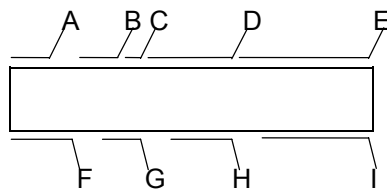
If the cycle selection is active on LCD at the moment of the start, see fig. Display - state of the program selection - E: cXX, the program comes again to the start after the last segment is over and the whole program is repeated. The definite number of program cycles corresponds with the number behind the letter "c". The segment 0 can be counted into the cycle, it can be skipped as well.

The time is - as distinct from P5 - not defined as the length of the segment, but it is defined by the hour, minute, day and month of its end, that means absolutely with respect to the real time. If the time and the date of the segment is set lower than the time and date of the previous segment, the segment will be finished in the next year. Set the relevant time and date including the year in the service mode. The rise to the set RH starts after reaching the set temperature.

Range of parameters:

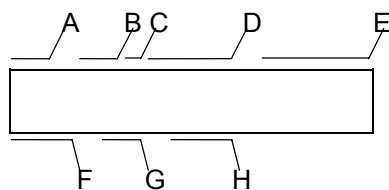
time	t0 to t15	each of segments up to a year
ramp	r1 to r15	0 to 3.2 °C/min for heating -1.0 to 0 °C for cooling
temperature	T1 to T15	0,0 to 99,9 °C
fan speed	V1 to V15	0 to 100 % with 10% steps
relative humidity	RH1 to RH15	10 % to 90 % with 1 %
light	L1 to L15	ON/OFF (only for the type CLC-L)
number of cycles	C	2 to 99 (eventually ∞ - which is the next position after 99)

Display - state of the program selection



- A: P6 name of the program
 B: XX number of the set segment
 C: X type of the set segment:
 x segment will be skipped over
 > not the last, the end length - see E, I
 >I the last, the end length - see E, I
 ∞ the last, infinite length
 D: XX . X the required temperature of the set segment (! the end temp.)
 E: tXX : XX the hour and minute of the set segment end, deciding is the ramp or
 TXX : XX the hour and minute of the set segment end, deciding is the time
 r±X . XX the ramp = required speed of the set segment, deciding is the time or
 R±X .XX the ramp = required speed of the set segment, deciding is the ramp or
 cXX the number of cycles of the whole program
 F: XXX the fan speed of the set segment
 G: XX disengaged
 H: XXX the light of the set segment
 I: XX . XX month and day of the set segment end

Display - running of the program



- A: * 6 the rotating symbol and the program number
 B: XX the number of the relevant segment
 C: X the type of the set segment:
 > not the last, the end length - see E
 >I the last, the end length - see E
 ∞ the last, infinite length
 D: XX . X the temperature in the chamber at the moment
 E: XX : XX the segment time at the moment - hours, minutes
 all segments - counting down from the maximum value towards zero,
 in case of an infinite length of the last segment counting up from zero
 in case the time is higher than 99 hr. 59 min >>:>> is indicated
 F: XXX the fan speed at the moment
 G: XX disengaged
 H: XXX the light at the moment

Caution!

When setting the time and temperature parameters in the programs 5 and 6 it is suitable to follow the following principles:

For setting the temperature it is necessary to cancel the ramp of the following segment (the following segment must have "T" or "r", it must not have "R" or "t").

At first the temperature is set then the ramp. If the ramp is deciding for the segment ("R" or "t"), it is suitable, if we want to change the temperature, to switch over to time at first ("T" or "r"). When setting a chain of segments it is suitable to go in the direction from the lower to the higher segment.

Examples of setting P5 and P6

Requirement: 5 working days operation at the temperature 20 °C, RH = 50 %, light 100 %, 2 weekend days at the temperature 4 °C, RH = 60%, light off; this course should be repeated in as many cycles as possible.

Setting in program P5

P	5		0	0	x	-	-	.	-	0	0	:	0	0
1	0	0		5	0		0	F	F					

P	5		0	1	>	2	0	.	0	T	0	0	:	0	0
1	0	0		5	0			0	N						

P	5		0	2	>	2	0	.	0	T	9	9	:	0	0
1	0	0		5	0			0	N						

P	5		0	3	>	2	0	.	0	T	2	1	:	0	0
1	0	0		5	0			0	N						

P	5		0	4	>	0	4	.	0	T	0	0	:	0	0
1	0	0		6	0	O	F	F							

P	5		0	5	>	0	4	.	0	T	4	8	:	0	0
1	0	0		6	0		0	F	F						

Note: the printer prints RH OFF in segments 0, 1, 4

Setting in program P6

Start monday 30.10 at 08:00

P	6		0	0	>	-	-	.	-		0	8	:	0	0
1	0	0		0	0	0	F	F							

Monday morning at 08:15

P	6		0	1	>	2	0	.	0	T	0	8	:	1	5
1	0	0		5	0		0	N		1	0	.	3	0	

Saturday morning at 08:00

P	6		0	2	>	2	0	.	0	T	0	8	:	0	0
1	0	0		5	0		0	N		1	1	.	0	4	

Saturday morning at 08:15

P	6		0	3	>	0	4	.	0	T	0	8	:	1	5
1	0	0		6	0		0	F	F		1	1	.	0	4

Monday morning at 08:00

P	6		0	4	>			.		T	0	8	:	0	0
						0	4		0	c	9	9			
1	0	0		6	0		0	F	F		1	1	.	0	6

The printer prints RH OFF in segments 0, 1, 3.

Note: The pause 15 minutes between 8:00 and 8:15 was chosen on condition, that this is a sufficiently long time for overcoming from one temperature to the other; if it is not the case, the pause must be set longer according to results of experiments.

The printer prints RH OFF in segments 0,1,4.

4.10 Error messages

Error messages are placed on LCD and have the following meaning:

Error 00 = the first sensor PT 100 not connected

Error 01 = the second sensor PT 100 not connected

Error 02 = the temperature is below the set lower limit (see Service 41 in Service instructions)

Error 03 = the temperature is above the set upper limit (see Service 41 in Service instructions)

Error 04 = safety thermostat activated, heating disconnected (see Service 07 in Operating instructions)

Error 05 = Error in the safety thermostat setting (see Service 07 in Operating instructions: caused either by starting a program whose set temperature is outside the limits of the safety thermostat setting, or by a HW failure)

Error 06 = steam generator overfilled (upper level indicator flooded for a longer time than three minutes) *

Error 07 = water supply interrupted (the filling valve has been opened for a longer time than 90 sec – drinking water, 180 sec – distilled water and the upper level indicator has not been flooded yet) *

Error 08 – 11 = device failure –used for developing purposes

Error 12 = the third PT 100 sensor (in the steam generator) not connected *

Error 13 = pump failure (it passed 120+60 sec since the pump was started five times and the upper level indicator has not been deflooded yet)*

Error 14 = level indicators failure (lower level indicator reports deflooding, upper level indicator reports flooding)*

Error 15 = the RH sensor failure (or a false calibration during the service)*

Error 16 = repeated error 13 in repeated test *

(Note: the pump pumps only in case of full flooding, when the water level reaches the switching-off level of the upper level indicator swimmer – see the swimmer positions in the picture below)

* It is a soft error. The difference between the soft error and the hard one is, that after the soft error occurs and is reported the whole running process is not stopped, only the system is eliminated, whose element has been detected as defective, in case of Climacell it is steam generator. Other systems continue their controlled function – heating, cooling, ventilator, lighting. If such an error occurs – the regulator (without interrupting the operation) informs – acoustically and optically by means of display – the operator. The acoustic signal is the same as in case of the hard error, the optical signal differs (from reporting the hard error) by flickering of the appropriate message on the display. In case of hard error it is shown permanently.

The soft error is used, because its cause can be removed by a simple correction and it is not necessary to interrupt the running process. E.g. the hose of the drain from the steam generator is rolled up improperly, which prevents the water to go out when turbidity is removed, on the other hand it is not necessary to interrupt the running process by a hard error.

If a “soft” error occurs, you can proceed in following ways:

- 1) By depressing X/W only the acoustic signal is suppressed so that it does not disturb. The humidity generating elements are blocked, the unit does not regulate the humidity. Other functions are kept and controlled.
- 2) By depressing STOP
 - both the acoustic signal is suppressed
 - and the humidity generating elements are unblocked. During the “soft” error the button STOP has not the function of stopping the operation. After depressing STOP, if the soft error cause is eliminated, the unit can continue the operation inclusive the humidity. If another error occurs in future, it will be signalized only optically, not acoustically.
- 3) By disconnecting the unit from mains and connecting it again (e.g. with the main switch) during the operation the elements of the humidity automatics are initialized and the unit starts running automatically in the same way as in case of the fall-out loss of electrical energy and the operation continues from the point of interruption. In this case another eventual “soft” error will be signalized both acoustically and optically.

If “soft” errors occur repeatedly, please inform your service organization.

4.11 Printing the protocol

Printing the protocol with printer CITIZEN, model iDP 3110-24 RF-A.

By setting the printer interval you give the time intervals of printing actual values of temperature in the chamber. Length of this interval is displayed in the head of the protocol.

Printer interval can be set - see paragraph Basic Setting, point Service 04.

1. Connect the printer to the thermal cabinet by means of the cable with serial connector (RS-232C) into the socket for the printer (see chapter Description of the cooling incubator, par. Connector RS-232C for connecting the printer), the other end of the cable connect to the connector in the rear part of the printer. Connect the printer to the mains by means of the adapter. Connect the printer to the mains by means of an adapter. Switch the switch on the right side of the printer on. The control light *POWER* and *SEL* switches on. The printer is in mode ON-LINE. You can shift the paper by pressing the button LF (can be carried out only in the mode OFF-LINE, i.e. after pressing the button SEL, the control light *SEL* switches off. To renew the mode ON-LINE the button SEL must be pressed, the control light *SEL* switches on). The printer prints only in mode ON-LINE!
2. Set required interval downwards or upwards according to point Service 04 in chapter Basic setting.
3. There is a head printed by the printer, the head comprises: type of unit, set temperature, eventually set ramp, number of cycles, ventilator rate, RH, light and the selected printing interval. Below the head following values are printed:

time since the start of the program, real temperature in the chamber (below eventually temperature on the flexible sensor), RH.

A new head is printed if:

- the cooling incubator is started
 - some parameter has been changed
4. You can stop the printing by setting the printing interval to **Printer off**.
 5. In case of a mains fall-out and restoring the supply again there is → **Mains fall-out** printed. The printing intervals start to be counted since the moment of restoring the current supply.
 6. In case of fall-out of the printer or switching the printer off there is no report printed after the switching on or restoring the supply.
- Setting the DIP switches of the printer Citizen iDP 3110-24 RF-A:
- 1., 3. and 4. DIP switch (from the left) – pin is in the lower position
 2. DIP switch (from the left) – pin is in the upper position

4.12 Checking the function of the safety thermostats

a) safety thermostat of the chamber

According to the procedure described in Service 07 – Setting the safety thermostat, set the limit temperature 85°C and confirm with the chip card SO. In P1 set the temperature 80°C and start the program. After reaching the set temperature wait ca. 10 minutes, stop the program and enter the Service 07; in Service 07 set the limit temperature to 70°C, confirm the setting with the chip card SO. The unit operates according to the description in Service 07 -Setting the safety thermostat: on the display “Safety thermost” etc.

b) safety thermostat of the steam generator

Disconnect Climacell from mains, dismount the fixing screw of the steam generator and shift the generator forwards. Unscrew completely the nut fixing the safety thermostat sensor and take the sensor with the nut and the rubber sealing out of the generator. Disconnect both wires from the contacts of the safety thermostat switch box and connect them to the terminals of the gauge, which is set to measure resistance. Under normal conditions (T = 23 °C) the resistance = 0.

Heat the sensor to the temperature 130 °C (- 20 °C), the resistance measured on a functional safety thermostat = ∞ , the resetting peg jumps out to the position OFF.

In this way the function of the safety thermostat is verified.

Clean the sensor, mount it back to the steam generator by following the reverse procedure, reset the thermostat with the resetting peg, mount the generator into Climacell, connect the cabinet to the mains. The cabinet is ready for operation.

5 Maintenance

5.1 Exchange of the door seal

Pull out the seal all around starting at the bottom middle.

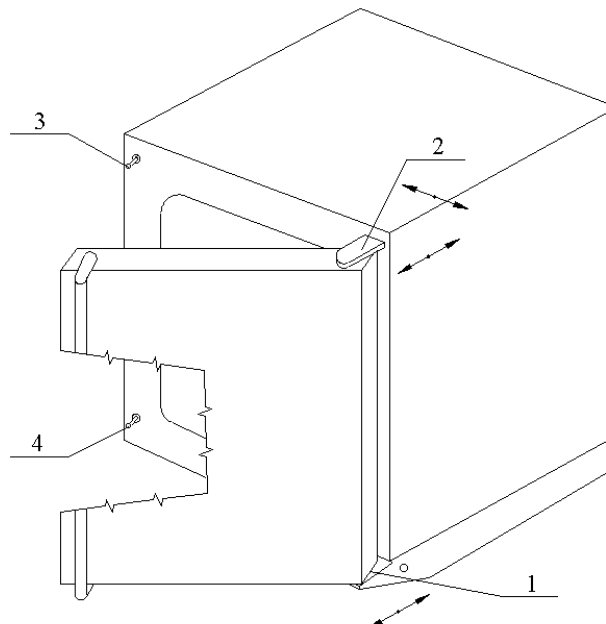
Fit the new seal onto the folded edge of the chamber starting at the bottom middle. The seal "clicks in" between the chamber and the outer casing.

To check the seal take a piece of paper and put it between the door and the chamber. Pull it out slowly, a rather strong resistance should be noticeable.

The door is adjustable at all four points:

- in the left upper part by means of bolts and nuts – sketch position 3
- in the left lower part by means of bolts and nuts – sketch position 4
- in the right upper part by means of screw with internal hexagon – sketch position 2
- in the right lower part after loosening the screw with internal hexagon adjusting in front-back direction of the door hinge is possible – sketch position 1.

Adjust the door so that when closed the rubber sealing of the chamber would fit to the sheet of the floating door along the whole perimeter. To check it up place a sheet of paper between the sealing and the metal sheet of the floating door before it is closed, it is possible to take the paper out against a small resistance.



5.2 Container for collecting the condensed water steam

During the operation of the cabinet, especially in case of higher humidity, a condensate can be collected in the lower part of the space between the inner glass door and the outer door. The collecting container is hung under the opening in the outer chamber jacket.

During the operation of the cabinet with built-in exposure lighting some air humidity can condense on the inner glass surface of the outer door in the cooling mode. This humidity runs down to a special shaped sheet with a drain discharging in a condensate container. (The container is hung under the opening in the outer chamber jacket).

The condensate container is discharged to the steam generator.

5.3 Cleaning the cooling incubator

Cleaning must be carried out only after cooling down of the unit and after disconnecting the cord from the mains. Clean the inner walls with water and detergent, eventually with appropriate chemical stuffs; outer surface of the unit should be cleaned only with a cloth wetted by water with detergent. Abrasive agents could cause scoring of sheets. **If you wish to clean also the external chamber jacket, remove the inner chamber walls in following way:**

Shift the upper chamber wall out of the unit, remove the side walls, bottom and rear wall.



After cleaning the unit put it together by following the reverse procedure. Take care that the bottom and side walls are shifted behind the four projections in the front part of the chamber. In case of leakage of some contaminated stuff into the chamber the user is responsible for a proper decontamination of all contaminated surfaces with a suitable and approved disinfecting agent.

Before using another cleaning or decontamination method, with the exception of the by us recommended methods, the user should consult the producer, whether the considered method could not cause a damage to the device.

5.4 Melting

During the operation with temperatures below 5 °C there occurs a gradual frosting of the condensate on the cooling exchanger. The melting is carried out by putting the cabinet out of operation until the full defrosting of the cabinet is achieved. The defrosting can be checked visually after removing all sheets of the inner chamber. The melting can be accelerated by short heating the chamber on condition that the temperature rise in the chamber does not cause a damage to the treated material eventually placed in the chamber.

6 Technical data

Technical data		Model	111	222	404	707
Inner dimensions Chamber, stainless steel	volume width depth height	l mm mm mm	111 540 370 530	222 540 520 760	404 540 520 1410	707 940 520 1410
Volume of the steam space		cca l	163	299	524	876
Trays, stainless steel Min. distance between trays	number	max./usual cm	7/2 7	10/2 7	19/2 7	19/2 7
Number of outer metal doors Number of inner glass doors			1 1	1 1	1 1	2 2
Admissible weight of trays together inside the oven per 1 tray		kg kg	50 20	70 30	100 30	130 50
Electricity data Protective system	max. power *) consumption mains 50/60 Hz	W V	2050 230 IP 20	2100 230 IP 20	3150 230 IP 20	3400 230 IP 20
Temperature data Working temperature Temperature accuracy Variation Deviation Heating/up time to 37 °C from the ambient temperature Cooling/down time from 22 °C to 10 °C Recovery time after 1 min. door open	from 0.0 °C at 10 °C at 37 °C at 37 °C at 50 °C	to °C ± °C ± °C ± °C min min min min	99,9 <0,5 <0,5 <0,2 24 <21 4 4	99,9 <0,5 <0,5 <0,3 25 <21 4 4	99,9 <1 <1 <0,3 26 <21 4 4	99,9 <1 <1 <0,4 27 <21 4 4
Relative humidity	range	%	10 - 90	10 - 90	10 - 90	10 - 90
Heat emission	at 37 °C	W	70	97	123	148
Outer dimensions (incl. door and handle, feet or rollers)	width depth height	max. mm max. mm max. mm	760 640 1100K	760 790 1330K	1010 790 1910K	1460 790 1910K
Weight	net gross	cca kg cca kg	101 131	132 169	230 270	270 316

All technical data are related to 22 °C of ambient temperature and ± 10 % voltage.

Swing Approx. 50 % of the tray area can be filled in a way a uniform air circulation is enabled inside the chamber.

There occurs temperature and humidity variation in case of regular turbidity removal during the operation

*) compressor + condenser + electromagnetic valves + ventilator (s) + steam generator heating

7 Warranty and service

Warranty is guaranteed by MMM for satisfactory delivery and functioning of the ovens within the contractual regulations and the period of the warranty.

MMM does not cover any deficiencies or damages due to normal wear and tear, chemical or physical attack, excessive overload, incorrect handling or due to the ovens being used in a way in which it was not intended to be used, particularly in case of non-observance of the enclosed operating instructions, incorrect installation resp. start-up by the customer or a third party, as well as in the case of damage to the system caused by foreign objects or inadequate maintenance and repairs.

If you send the unit back to the manufacturer (for example for a repair or if you claim to change it) use the original wrapping. Otherwise you are responsible for a possible damage by transport and the manufacturer will claim a compensation for repairing the damages caused by transport.

For the correct connection of the ovens to the power supply the technical data and operating instructions are to be observed.

Important note:

MMM (producer) is responsible for safety-technical parameters of the unit only if all repairs and adjustments are carried out by producer or another by producer authorised organisation and if the parts used in repair will be replaced by spare parts approved by producer and corresponding to the quality standard of MMM.

MMM recommends the user of the unit to require a protocol of the repairing firm about art and range of procedures, eventually report about changes of the nominal data or working range, date of repair, name of the firm and signature.

To connect the unit to the mains properly follow the technical data and operating instructions.

8 Transport and storage

Device will be prepared for transport by a competent person (who also disconnects the device from the mains). Device must be transported and stored in original wrapping. If you send the device back (for reparation or change in case of reclamation), use the original wrapping. Otherwise you overtake the responsibility for event. damaging during the transport and the producer will reclaim compensation for event. additional reparations. Device can be stored in the ambient temperatures of 0 °C to 40 °C.

9 How to eliminate wrappings and a unit out off service

- a) pallet – in a refuse incinerating plant
- b) cardboard –waste for recycling
- c) unit out off service – elimination should be done by a licensed firm, the unit does not contain any toxins

10 Optional equipment

10.1 Inner lighting

Inner space is illuminated with thermo-resistant bulbs - their switch is placed on the door.

10.2 Bushings of diameter 25, 50, 100 mm

The bushings are normally placed cca in the middle of the side (right or left) wall of the chamber. The bushes are metallic, closed with a special plastic plug from the outer side, which enables passing through of wires etc. from the outer space to the chamber.

Recommendation: the used unit should be provided with a bushing with corresponding dimensions, if user wishes to measure temperature or RH inside the chamber by means of sensors, that are connected with an independent measuring device by means of wires; the user pulls the wires through the bushing.

10.3 Lockable door

The lock is placed on the upper part of door's surface near the closing mechanism.

10.4 Left door

This is the symmetric mirror version of the right door. The cabinet of 404 liter is not delivered in this version.

10.5 Independent sensor PT100

Independent flexible sensor is used for measuring of material temperature directly in the chamber. The date of temperature on this sensor (PT2) is displayed on LCD in the position of time date, while these two data are altering.

The corresponding printed protocol has two lines, first line - beginning with digit 1 - shows the temperature on the sensor of regulator (PT1), second line beginning with digit 2 shows the temperature on the sensor PT2.

In case of failure of the contact between PT2 and regulator the display shows Error 01.

10.6 Communication SW DS Com for PC under Windows

The software DS Com is designed to record the temperature course in the thermal cabinets. Data obtained during the regulation are displayed in form of a graph (with time on the horizontal axis and obtained data on the vertical axis). The software enables to follow the regulation in real time, to store the regulation course to a file on the disc and to view the already stored files.

Operation instructions of this software are delivered together with the installation software, minimal requirements on PC hardware for the program DS Com 2.1 are:

- IBM-compatible PC (386 and above)
- Operation system Windows 95 and above
- 80 MB RAM
- one-hour-record of data requires free space of about 60 KB on the hard disc
- free serial port

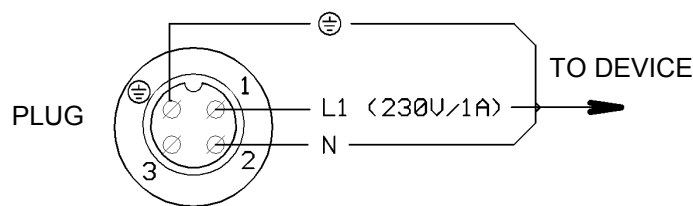
10.7 Potential-free contact for alarm reports

It's outlet is placed in the connector in the rear foot, a voltage up to 24 V/ 1A can be connected to it.

10.8 The inner switched socket

The socket is placed inside the chamber on the side wall. Details of the switching control see par. Basic setting of the units Climacell – Service 06, connection and other details are given in the following diagram and text.

Connecting the connector to the built-in device.



Warning:

The plug must be connected only by a person with a sufficient qualification.

When the plug is plugged in and out of the socket, or when manipulated with the inner equipment, CLIMACELL must be switched off (the mains switch in the position-„0“).

The socket-plug contact must be tightened in order to prevent disfunctioning of the protective system.

After disconnecting the socket-plug contact fit carefully the protection covers on the socket and the plug so that impurities and humidity would not get inside.

10.9 Exposition lighting in the door

There is an exposure fluorescent lighting placed in the door, whose intensity is controlled from 0 % to 100 % in 10 %-steps, details see chapter Basic setting, point Setting the lighting – type with door lighting.