

memmert

OPERATING INSTRUCTIONS

Electronically controlled drying ovens

UP 400-800

ULP 400-800

Electronically controlled sterilisers

SLP 400-800

Electronically controlled incubators

BP 400-800

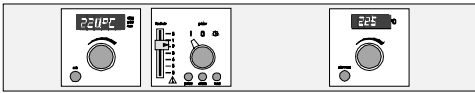
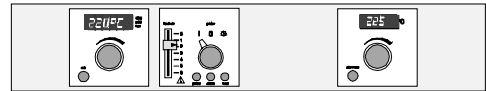
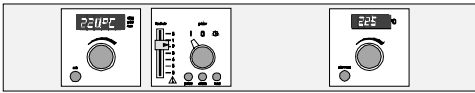


TABLE OF CONTENTS

1	Congratulations on your choice of a MEMMERT Oven!	4
2	The equipment of MEMMERT cabinets Series UP, BP, ULP, SLP consists of:	5
2.1	Electrical supply	6
2.2	Installation options (special equipment)	8
2.3	Wall mounting (special equipment)	8
2.4	Hole pitches for wall fixing (wall bracket).....	8
2.5	Stacking device (special equipment).....	9
3	Putting into operation	9
3.1	Operating the door	9
4	Main switch module.....	10
4.1	Operation without Memory Card XL:	10
4.2	Operation with Memory Card XL:	10
5	Working controller module.....	11
6	The Memory Card XL	12
6.1	Programming:.....	12
6.2	Programming via the process controller	12
6.3	Programming with the PC program "CELSIUS 2000"	13
6.4	Programming with the write/read device (special accessory).....	13
6.5	Documentation	13
7	The parallel printer interface.....	14
7.1	Printer connection	14
7.2	Integrated real-time clock	14
7.3	Display	14
8	Serial communication interface	16
8.1	Communication protocol.....	16
8.2	Computer connection	16
8.3	Interface RS232C.....	16
8.4	Interface RS485	17
9	Working controller module with main switch in position I (continuous operation)	18
9.1	Submenu SETUP	20
9.2	The working controller module with main switch in position 	22
9.3	Editing the programme / EDIT submenu	24
9.4	Segment end command	26
10	Programme start	27
10.1	Programming example	28
10.2	Programming example for setpoint-dependent operation.....	30
11	The MEMMERT software „Celsius 2000“	32
12	Safety devices	33
12.1	Adjustable overheat controller (TWW), Class 3.1 in accordance with DIN 12880 or adjustable temperature limiter (TWB), Class 2 in accordance with DIN 12880	33
12.2	Temperature limiter (TB), Class 1 in accordance with DIN 12880.....	34
12.3	Possible problems during the first run	34
13	Loading	35



14	Sterilisers	36
14.1	Application.....	36
14.2	Instructions for sterilisation in MEMMERT hot-air sterilisers.	36
14.3	Notes on working with sterilising cassettes:	37
14.4	Example of programming a sterilisation profile.....	38
15	Maintenance.....	40
15.1	Readjusting the door	40
16	Cleaning	41
17	Check list for rectifying faults.....	41
18	Our Address	42
19	Index	46



The text of these Operating Instructions has been translated from the German. If any part of the text is doubtful or the interpretation is unclear, and also in case of errors, the German original is to be considered as valid.

1 Congratulations on your choice of a MEMMERT Oven!

Manufactured in Germany using the latest production techniques and finest materials available, you now possess a technically superior and fully developed product. Your oven has already been subject to extensive testing in our factory.

For correct operation of the equipment it is essential to observe the operating and maintenance instructions below. This will ensure that your equipment will give many years' satisfactory service.



Explanation of symbols:

These symbols mark important information in the operating instructions

The corresponding markings on the unit mean:

Note the Operating Instructions!
Warning, outside of case may be hot!



General safety instructions:

Full consideration must be given to physical and chemical properties of your load (e.g. combustion temp. etc.) to avoid serious damage to load, oven, surroundings.



Please note that the MEMMERT ovens described here are not explosionproof (they do not conform to Occupational Association Regulation VBG 24). They are therefore unsuitable for drying, evaporating or burning-in of paints, enamels or similar substances whose solvents may form an inflammable mixture together with air. There must be no possibility for inflammable or explosive gas/air mixtures to form either inside the cabinet or in the immediate neighbourhood of the equipment.



Excessive dust or corrosive fumes in the interior and/or around the oven may result in deposits within the oven and cause short-circuits or damage to the electronic parts. Therefore dust and corrosive fumes should be kept away from the unit.



Transport:

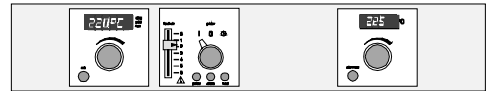
Always use gloves !

To carry the unit requires at least 2 persons (Models 400,500) and 4 persons (Models 600,700)



WARNING!

Take special care when oven is working at high temperatures!
The outer case may be hot!




2 The equipment of MEMMERT cabinets Series UP, BP, ULP, SLP consists of:

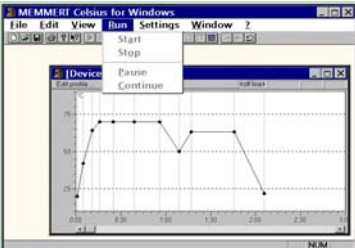
- an electronic fuzzy-supported microprocessor PID process controller with programmable heating and cooling ramps, set temperature operation and loop function. The controller features continuous power adjustment as well as a time-saving self-diagnostic system for the quick detection of faults (see check list).

One programme held in the internal memory can include up to 9 segments and is stored in the controller even if there is a power failure. The external Memory Card XL can carry up to 40 segments.

- The fan (in Type L units) is adjustable
- a built-in timer for digital programme time selection up to 999 hours, as well as an alphanumeric display
- the air flap can be adjusted by means of a servomotor.
- parallel printer interface for high-resolution graphic or numerical printout on an external EPSON ESC/P2 compatible printer

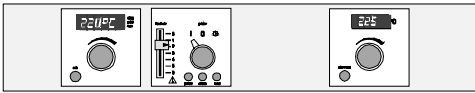
-  A pre-formatted blank Memory Card XL with a memory capacity of 32 kByte. Reprogrammable for up to 40 ramp segments and additionally 270 hours of protocol storage, with 1 minute sampling interval.

- Memory Card XL reader built into the oven
- RS232C interface for heating programmes controlled or recorded by chip card or computer. An RS485 interface is also available to special order.

-  With the MEMMERT software **Celsius 2000**, consisting of installation diskette and operating manual, the controller can be operated remotely via a PC.

Special accessory(to be ordered separately)

-  Temperature profile write/read device for PC



Technical data summary

A Pt 100 DIN A in 4-wire circuit measures the temperature in the working chamber. The temperature setting accuracy is 0.1°C for BP types and 1°C on UP/SLP types.

Ovens Series UP, BP, have natural air circulation.

Series ULP and SLP ovens have circulation assisted by a fan.

Ambient conditions Ambient temperature 5°C - 40°C, rH max. 80%. Overvoltage Category II. Contamination degree: 2 according to IEC 664

Setting temperature range 20°C - to nominal temperature (see rating plate).

Working temperature range From 5 °C above ambient to nominal temperature = maximum temperature (see rating plate).
When the fan of the models ULP / SLP is switched on, the working temperature can be set from 10°C degrees above ambient up to the nominal temperature = maximum temperature (according to rating plate).

Overheat safety device Standard adjustable overheat control in compliance with DIN 12880 Class 3.1 and additional mechanical temperature limiting device Class 1. Class 2 protection (adjustable temperature limiter) available on request.

Class	Aim of protection	Scope of protection	Safety device	Safety measures
1	Protection of the oven	No risk liable to originate from the oven in the event of a fault	TB (temperature limiting device) automatically shuts off the oven if the user-selected temperature limit is exceeded.	Special safety measures required depending on the purpose for which the oven is used
2	Protection of the oven, the environment and the contents of the oven	No risk originating either from the oven or its contents in the event of a fault	TWB (adjustable temperature limiter) automatically shuts off the oven if the user-selected temperature limit is exceeded.	
3.1		The contents of the oven are protected against overheating	TWW (adjustable overheat controller) takes over control of oven if temperature is exceeded.	

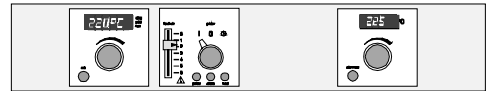
2.1 Electrical supply

50 or 60 Hz. Insulated supply incorporating earth conductor according to EN 61010, Protection IP 20, no humidity protection according to DIN 40 050. Interference suppression Grade N according to VDE 0875, limiting values to Class B, Group 1.

A fuse 250V/15A fast is used for unit protection (3 fuses on units for 400 V 3ph/N power supply).

When connecting a Memmert oven to the supply you have to observe any local regulations which apply.

(e.g. in Germany, DIN VDE 0100 with FI - safety device).



model	volume	current	power	voltage $\pm 10\%$	weight
UP/ULP/SLP 400	53 l	6,1 A	1400 W	230 V~	35 kg
UP/ULP/SLP 500	108 l	8,7 A	2000 W	230 V~	50 kg
UP/ULP/SLP 600	256 l	10,4 A	2400 W	230 V~	87 kg
UP/ULP/SLP 700	416 l	5,8 A	4000 W	400 V 3ph/N~	121 kg
UP/ULP/SLP 800	749 l	7,0 A	4800 W	400 V 3ph/N~	164 kg
BP 400	53 l	3,5 A	800 W	230 V~	35 kg
BP 500	108 l	3,9 A	900 W	230 V~	50 kg
BP 600	256 l	7,0 A	1600 W	230 V~	87 kg
BP 700	416 l	7,8 A	1800 W	230 V~	121 kg
BP 800	749 l	8,7 A	2000 W	230 V~	164 kg

This equipment is intended for operation on a supply system with a system impedance Z_{\max} at the transfer point (building connection) which does not exceed 0.12 Ohm. The user has to ensure that the equipment is being operated on a supply system which meets this requirement. If necessary, details of the system impedance can be obtained from the local power supply authority.

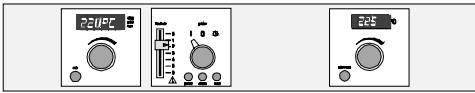
Quality of material

Memmert is using stainless steel (Spec. 1.4301) for the external casing as well as for the interior, an outstanding material because of its high stability, optimum hygienic features and corrosion resistance against many (not all!) chemical compounds (Warning against chlorine compounds, for example !)



WARNING!

Before removing top cover – pull out plug !



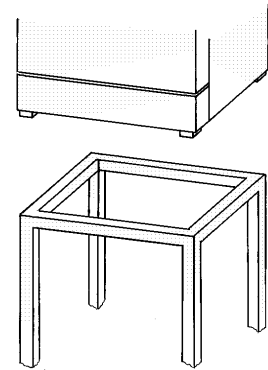
2.2 Installation options (special equipment)



Do not place the steriliser on a readily inflammable support!

The cabinet can be setup on the floor or on a table (bench), model 500 - 700 on a subframe. Ensure at least 150 mm clearance between back of oven and wall. The distance between ceiling and oven should not be less than 200 mm and the minimum wall spacing to the sides is 80 mm. In general, adequate air circulation around the unit is required.

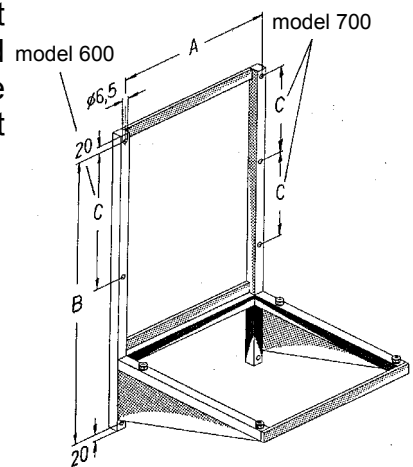
After the cabinet has been set up horizontally the door can be adjusted if required (**see chapter - MAINTENANCE**).



The model 800 is movable. The front castors have provision for locking. In order to assure stability, the front castors **must always be set to the front** of the oven for locking.

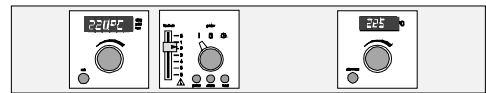
2.3 Wall mounting (special equipment)

For all ovens up to model 700 a metal mounting bracket (see Fig. a) is available. The mounting bracket is supplied with a fire-resistant plate. incombustible plate. The dimensions of the fixing screws have to be chosen to suit the total weight (oven and load) and the quality of the wall.



2.4 Hole pitches for wall fixing (wall bracket)

model	A		B		C	
	mm	inch	mm	inch	mm	inch
400	489	19,25	850	33,47	-	-
500	649	25,55	930	36,61	-	-
600	889	35,00	1090	42,91	540	21,26
700	1129	44,45	1250	49,21	410	16,14

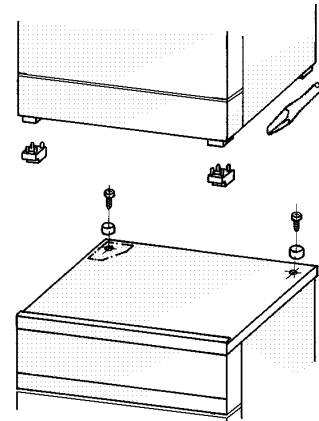


2.5 Stacking device (special equipment)

Where two ovens of the same size are to be placed one on top of the other, the oven with the lower working temperature should be placed at bottom .

Mounting:

- Remove the front feet of the top oven and replace them with the ones supplied with the stacking device (only if the ovens are not originally supplied with the stacking device). Remove the top of the bottom oven and turning it upside down place the drilling jig into the back corner. Mark out the hole position and drill a 4,2 mm diameter hole.
- With the screws provided fix the centering cylinders into position. Re-fix top cover.
- Model 700 can only be stacked with an intermediate frame.



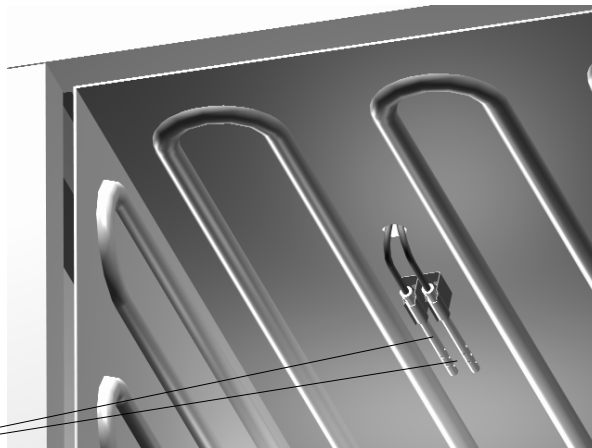
3 Putting into operation



Note !

Extremely strong shocks during transport can cause a displacement of the temperature sensors in the holding clips inside the working space.

Before the oven is first put into operation, check that the temperature sensors are in their correct position; if necessary slide them carefully backwards and forwards in the holding clip (see fig.)



temperature sensor PT 100 metal

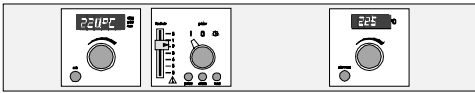
3.1 Operating the door

The door is opened by pulling the door knob, and is closed by pushing in the door knob.



Important !

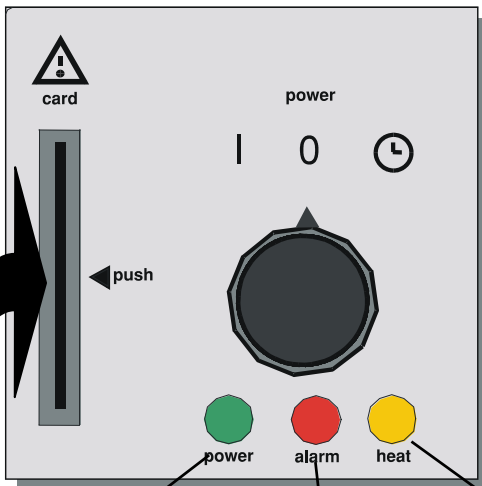
When the oven is started up for the first time it should be run under supervision until steady conditions are reached.



4 Main switch module

The main switch module contains:

- main switch to select the working mode
- three signal lamps for display of the unit status
- slot for Memory Card XL



- **Main switch in position 0:**
unit is shut down
- **Main switch in position I:**
continuous operation
operation from PC with **Celsius 2000**
- **Main switch in position ☰:**
programmed operation

Direct operation (without card), alternatively
operation using the Memory Card XL

Green Ready for operation **Red** Fault indicator **Yellow** Unit is heating



Insert the MEMory-Card XL in the slot

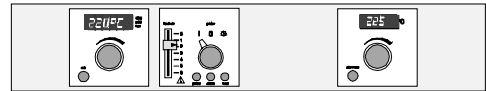
- Insert the card and press to lock into place ("arrow mark to arrow mark").
- The card is released by pressing it again ("push-push-principle").

4.1 Operation without Memory Card XL:

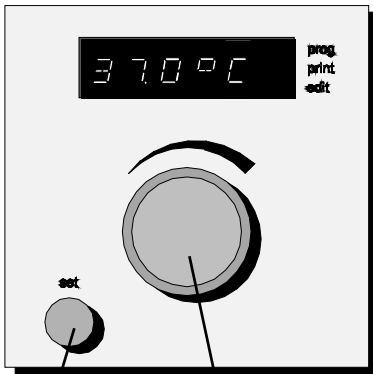
- The controller parameters set on the oven itself (with operation in main switch position I or with programmed operation ☰) remain stored permanently the controller.

4.2 Operation with Memory Card XL:

- An inserted Memory Card XL **does not** influence operation in main switch position I.
- When the chip card is inserted with main switch in position ☰, the programme is stored on the card and is also run from there.



5 Working controller module

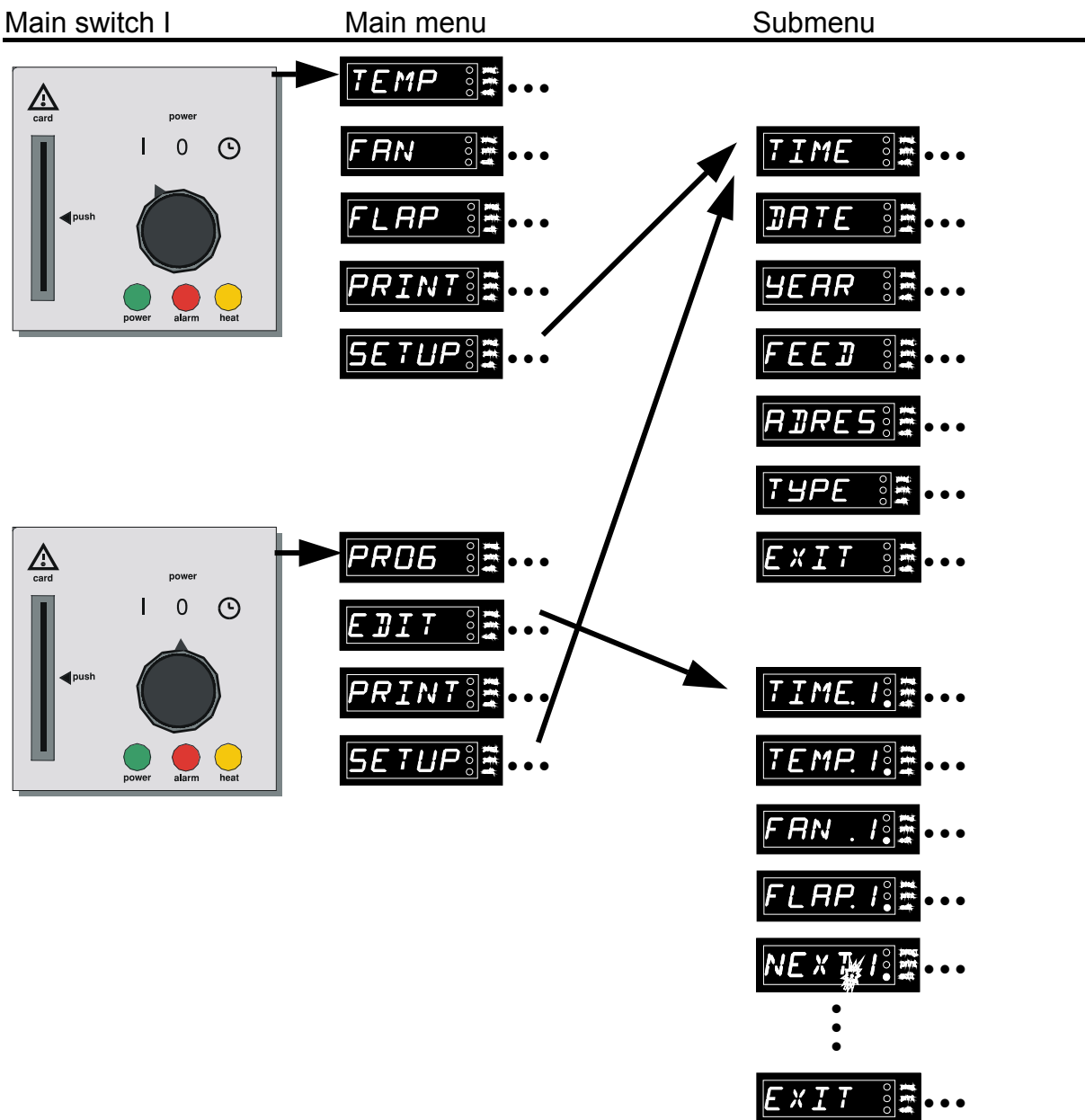


set button rotary knob

The working controller can be operated using the digital rotary knob and the set button as described in the following sections.

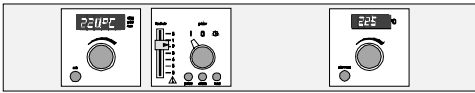
Text messages on the multifunctional LED display guide you through the different menu items. This makes the operation of the P-controller largely self-explanatory.

This page gives an overview of the menu structure with its main menu and the sub-menus. On the following pages the menu items and the functions are described in detail.



NOTE:

- The return from any menu to the actual temperature is achieved by choosing the menu item **EXIT** or occurs automatically after 30 sec.



6 The Memory Card XL

6.1 Programming:

A temperature profile with up to 40 ramps can be programmed on the Memory Card XL. Programming can be done directly at the controller or via the PC program "**Celsius 2000**".

It is recommended to use the graphic environment on the PC to build up programs with more than 9 ramps.



Labelling:

The labelling field of the Memory Card XL can be marked individually with a text or a diagram.

Storage volume for protocol data

A certain amount of storage space is available for documenting depending on the length of the programme. The sampling rate is set automatically by the controller depending on the length of the programme.

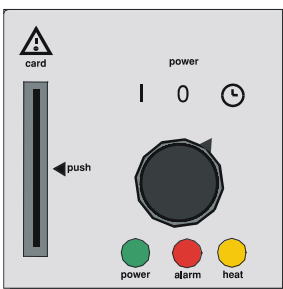
Up to a total programme length of 270 hours, actual data recording on the Memory Card XL is done with a one minute sampling rate. With longer programmes the sample rate is increased by 1 minute for every 270 hours.

Write protection

Write protection can be set on the MEMory Card XL via the PC program "**CELSIUS 2000**". This prevents the programme on the Card from being edited at the controller.

6.2 Programming via the process controller

Insert the Memory Card XL into the slot and press to lock into place.



Put the main switch into position . Programming of the controller is described in the section **Working controller module with main switch position** .

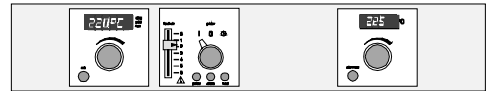
The controller settings are programmed in the same way as without a Memory Card XL. The selected settings are written on the card and stored there.

After removing the card, the programme stored in the process controller itself is activated again.

Programme start and stop are carried out as described in section **The working controller module with main switch in position** .

Note: The programme remains stored on the card even after it has been removed from the slot. It can, however, be overwritten at any time via the controller or a PC.

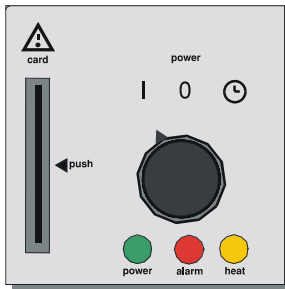
Programme modifications via the controller are possible if write protection was disabled by the PC.



6.3 Programming with the PC program "CELSIUS 2000"

Connect the PC to the oven via a shielded serial interface according to DIN 12900-1. (see section – **The serial communication Interface**)

Insert the Memory Card XL into the slot on the oven and press to lock it into place.



Move the main switch to **position I**.

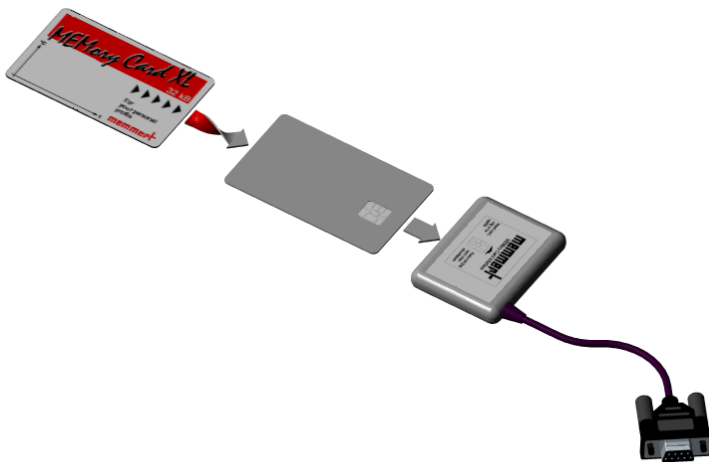
Programme the controller settings exactly as described in the manual supplied for the program „**Celsius 2000**“.

The settings are written on the card and stored there. After removing the card from the slot, the programme stored in the process controller itself is activated again.

The temperature profile only runs with the main switch in position .

Note: The programme remains stored on the Memory Card XL even after it has been removed from the slot. If it is not write protected the programme can, however, be overwritten at any time via the controller or a PC.

6.4 Programming with the write/read device (special accessory)



With the aid of the write/read device which can be ordered additionally, the Memory Card XL can be programmed off-line from a PC without an oven having to be connected up.

When inserting the Memory Card XL it is important to ensure that the contact field is at the **top** towards the marking of the write/read device.

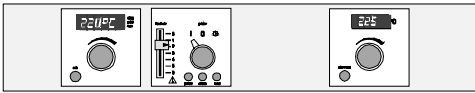
For details concerning the programming of the Memory Card XL using the write/read device, see the manual for „**Celsius 2000**“

6.5 Documentation

During the course of a heating programme the actual values of the temperature profile are also continuously recorded on the Memory Card XL. These values can be read via "**CELSUS 2000**" after the programme has finished, and then printed out. The method for this is described in the manual for "**CELSIUS 2000**".

If the programme is restarted by the user the data are overwritten.

Further documentation facilities are available in the programme "**CELSIUS 2000**", which writes the graph of actual values to a documentation file (see manual).

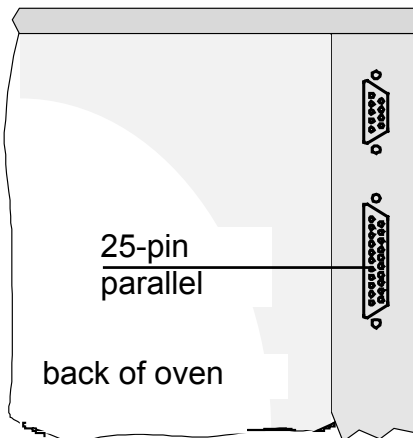


7 The parallel printer interface

All units of the class P are fitted with a parallel interface of the same type as used in personal computers.

7.1 Printer connection

All EPSON - LQ[®] or ESC/P2 compatible 24-dot matrix and ink-jet printers can be used. Colour printing is also supported. Green (broken line) = set temperature, red (continuous line) = actual temperature.



A parallel 25-pin SUB-D interface serves as connection. It is located on the back of the unit.

A shielded cable must be used for the interface connection with the shielding connected to the housing of the plug. If the parallel port is not used, the plug must be protected with the protection cap.

7.2 Integrated real-time clock

The real-time clock includes date and time function. These parameters can be set as described in the **SETUP** submenu.

The real-time clock is used for temperature recording in accordance with GLP*. The date and time are written on the protocol printout.

In the graphic printout the time axis is marked in real time.

The clock is powered by a battery. It works independently of the power supply. The built-in lithium battery has a lifetime of about 10 years.

7.3 Display

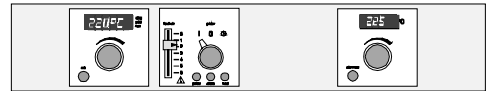


The LED **print** flashes in the display of the working controller module while data is being transmitted to the printer.

the **print** LED is flashing but there is no print-out on the printer, please check your printer setting.

If the printer is defective, e.g. runs out of paper, the LED **print** is on permanently. In this case refer to the operating instructions of your printer.

* GLP: Good Laboratory Practice



Printer mode The menu item **PRINT** activates the data transmission to the printer.

Numerical print



numerical printout with GLP* header data

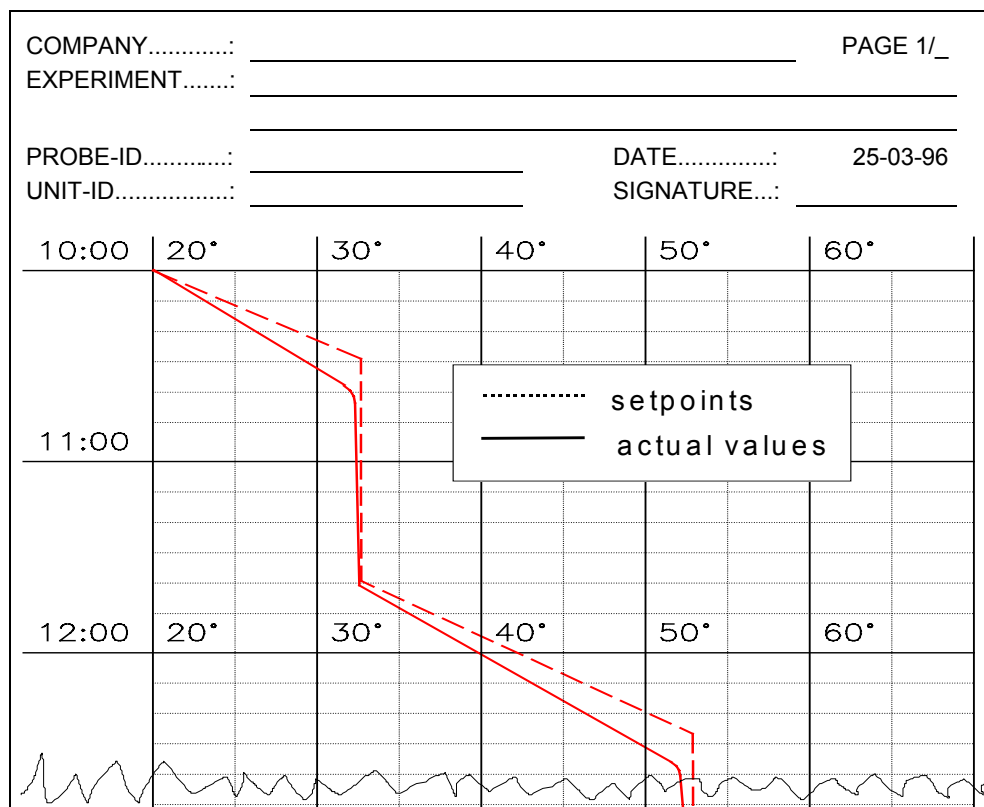
COMPANY.....:	_____	PAGE 1/_
EXPERIMENT.....:	_____	
PROBE-ID.....:	_____	DATE.....: 25-03-96
UNIT-ID.....:	_____	SIGNATURE...: _____

TIME	DATE	SETPOINT TEMP	ACTUAL TEMP	FAN	FLAP
10:00	25-03-96	22°C	22°C	20%	-
10:01	25-03-96	23°C	22°C	20%	-
10:02	25-03-96	24°C	23°C	20%	-
10:03	25-03-96	25°C	23°C	20%	-

Graphic print



graphic printout with GLP* header data



Print deactivated

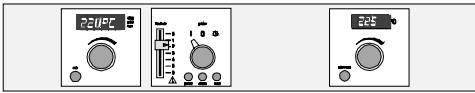


No data is sent to the printer.

Note !

In programme operation (main switch position ☉) the print-out ends with the command **END**. (see under segment end commands).
 On programme start the documentation starts automatically if the **GRAPH** or **NUM** function is activated.

* GLP: Good Laboratory Practice

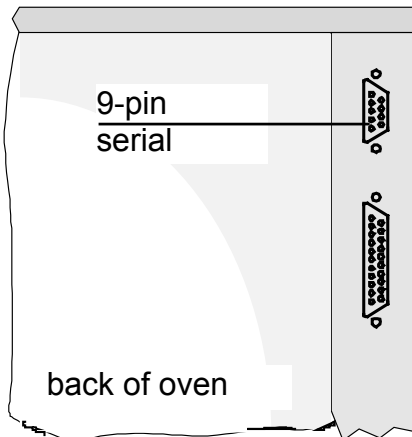


8 Serial communication interface

8.1 Communication protocol

The communication protocol of the MEMMERT P-controller was defined following the rules of the association for standards for measurement technology and control engineering in the chemical industry (NAMUR).

8.2 Computer connection



For linking your P-appliance to your PC there is an **interface connector** on the back of the casing of every unit.

The oven can be linked to the PC using a shielded interface lead to the connector. If a different lead is used, care must be taken to use a shielded interface lead. The shielding must be connected to the plug casing.

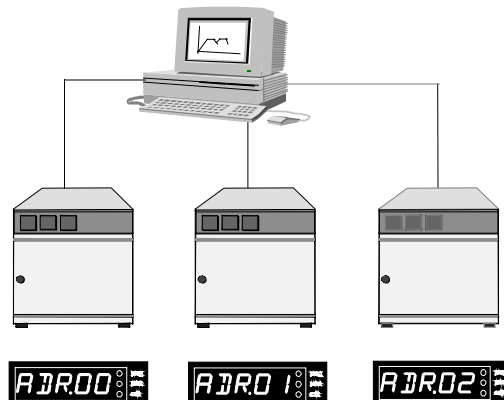
If the serial port is not used, the plug must be protected with the protection cap.

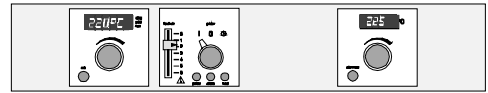
8.3 Interface RS232C

The P-unit is equipped as a standard feature with an RS232C interface according to DIN 12900-1. With this interface it is possible to operate the oven from a PC. This is done with the aid of the „**CELSIUS 2000**“ software program. In the submenu **SETUP** the oven must be allocated an address in the menu item **ADRES**. The PC then communicates with the oven using this address. The standard setting is *ADR00*.

Should more than one unit be linked to one PC via an RS232C interface, then each unit requires an appropriate interface on the PC and a separate lead. The maximum length of one lead is 15 m.

Example: Three ovens linked to one PC via RS232C.





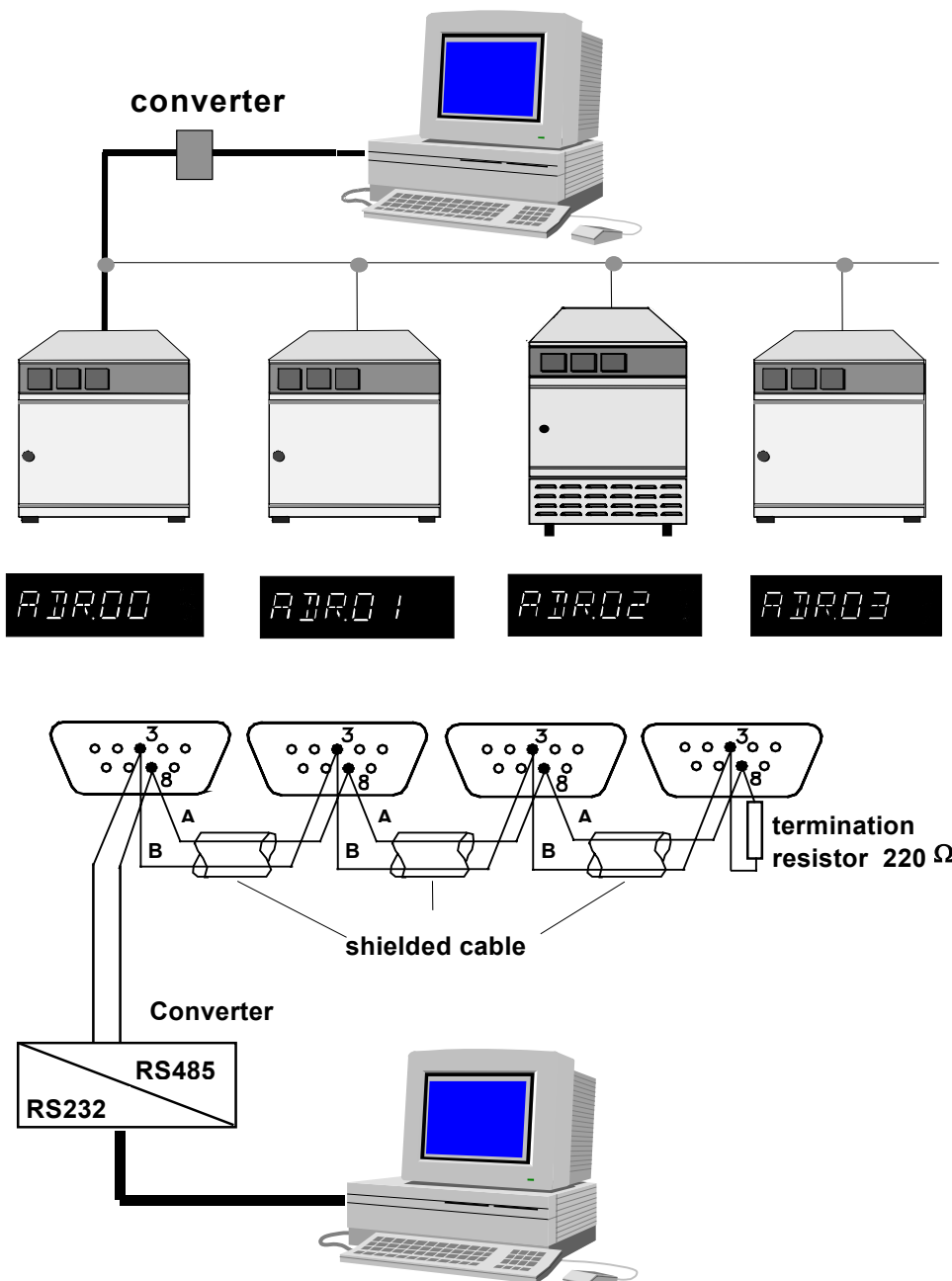
8.4 Interface RS485

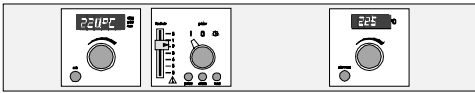
If specially ordered, the unit can be fitted at the works with an RS485 interface instead of an RS232C interface. This enables several units (up to 16) to be networked with a PC via a common two-wire connection. By allocating addresses to the individual ovens in the **SETUP** submenu under the menu item **ADRES**, the networked ovens are assigned unique number addresses. These can be used to call up the oven and programme it from the PC.

For this type of connection the PC must either have an RS485 interface or be equipped with an RS232/RS485 converter.

Wiring is arranged individually depending on the installation site, using a shielded cable. The maximum overall length of the line is 150 m

Example: Four ovens networked via an RS485 interface.



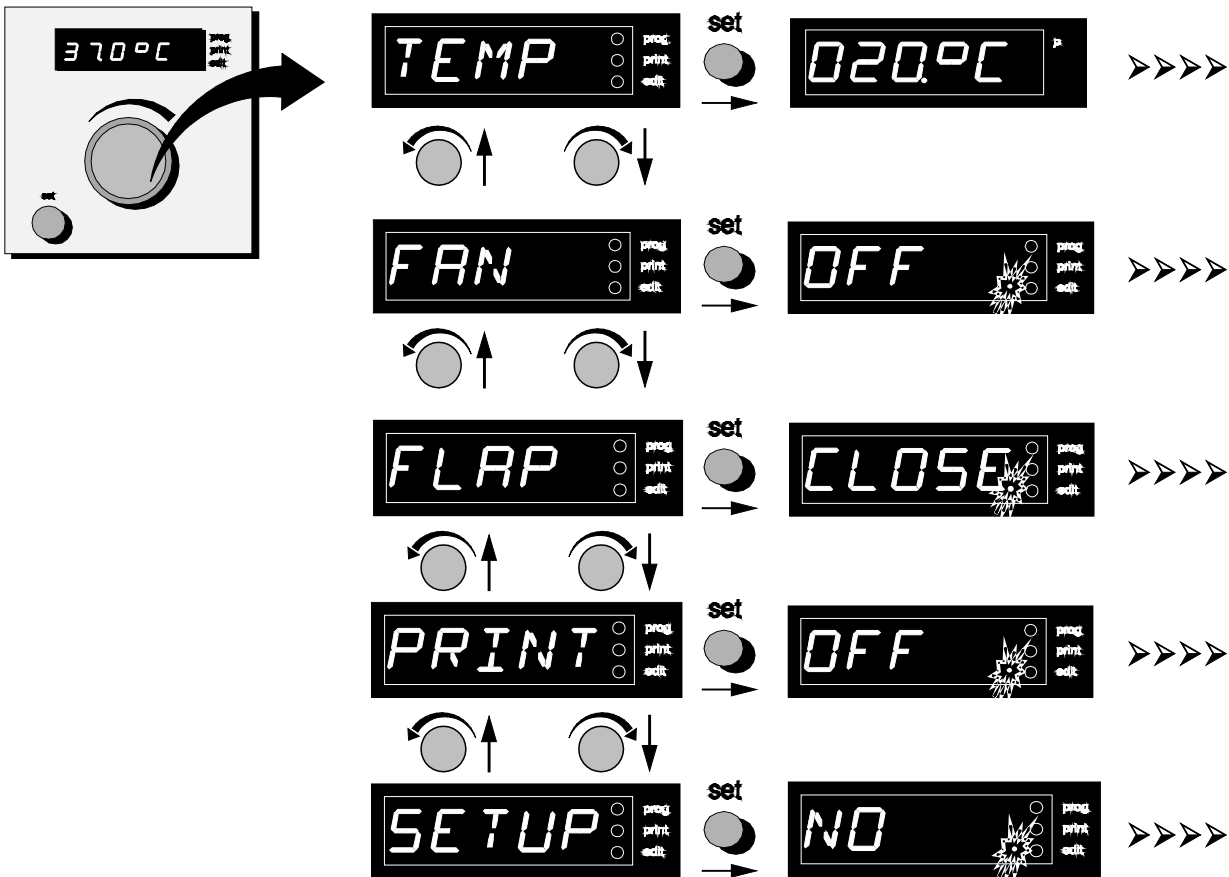


9 Working controller module with main switch in position I (continuous operation)

With main switch in position I the oven operates continuously and all adjustments immediately affect the unit operation. The temperature setpoint and the other working parameters can be selected as follows:

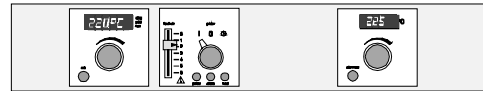


Menu items for main switch position I



Brief instructions

	Show setpoint values
	Turn rotary knob to the right (clockwise): => Select next menu
	Turn rotary knob to the left (anticlockwise): => Select previous menu
	Turn rotary knob to the right, while pressing set button. => increase parameter
	Turn rotary knob to the left, while pressing set button. => decrease parameter
Slow turn:	Single steps
Rapid turn:	Large steps



Menu item **TEMP** to adjust the set temperature.



FAN serves to set the speed of the fan in those units which are fitted with one. The setting is carried out in 10% stages. **OFF** means: fan is switched off completely. ★



FLAP serves to pre-set the air flap in 10% stages. **CLOSE** means that the air flap is closed, **OPEN** means that it is fully open but there is no complete fresh-air operation.



The print options of the printer interface can be set in the menu item **PRINT** (see section **The parallel printer interface**)



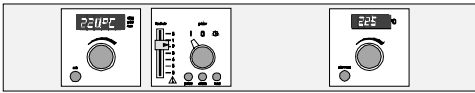
Selecting **YES** in the menu item **SETUP** opens the submenu for the controller configuration settings .(see section **Submenu SETUP**)

General notes!

- All the programmed values are stored at the end of the setting procedure and remain stored even after the unit is switched off or after the supply to the oven is interrupted. After restarting, the controller automatically returns to the print mode set previously.
- The flashing decimal point means that the present value of the particular menu item is being shown.

★ **Note:**

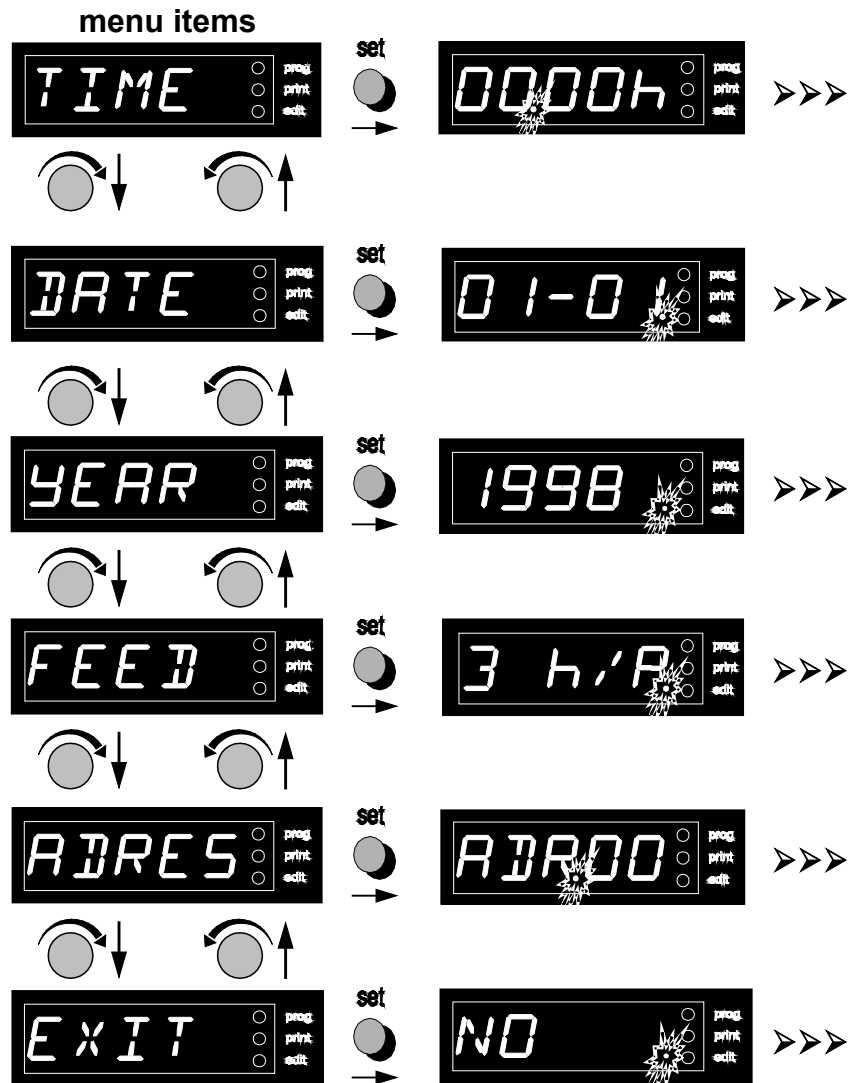
A reduction in the fan speed can affect the temperature distribution in the working space and the control behaviour.

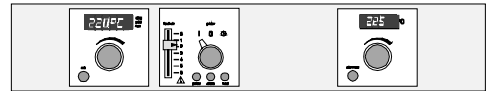


9.1 Submenu SETUP

After selecting **YES** under the menu item **SETUP** you branch to the submenu for the configuration of the controller. Time and date of the integrated real-time clock, the paper feed and the oven address are set here.



Note: The return from the **SETUP** submenu to the actual temperature is achieved by selecting the menu item **EXIT/YES** or occurs automatically after 30 sec.







time in 24-hour format
 setting range: 00.00h to 23.59h



date in the format day-month.
 setting range: 01-01 to 31-12, with automatic 30./31. dayswitching,
 as well as 29th Feb. in leap years.







year
 setting range: 1996 to 2095

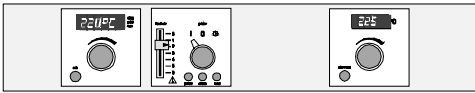




line feed
 The settings 3 hours/page, 12 hours/
 page and 7 days/page are possible.



address allocation
 The unit can be allocated an address from 0 to 15. This must agree
 with the selected address in the PC-controlled software program
CELSIUS 2000. In this program up to 16 units can be called up and
 programmed individually.




 By selecting **NO** the controller will remain in the submenu **SETUP**
 Choosing **YES** leaves the **SETUP** submenu and the present
 temperature is shown again.



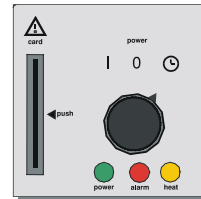
9.2 The working controller module with main switch in position

After switching on, the display shows for a few seconds the program version of the controller.

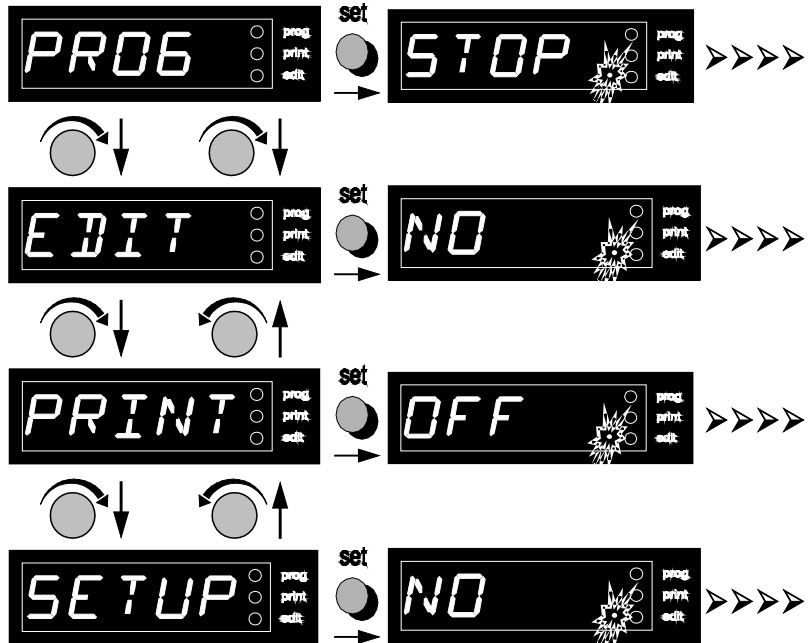



The unit operates in programme mode if the main switch is set to position .


In this operating mode the programme can be started and stopped, and in the submenu **EDIT** the programme can be changed. The setting will affect the unit operation after the programme is started. The flashing LED **prog** indicates that the programme is running.

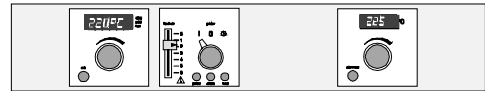


Menu with main switch in position



 = turn rotary knob clockwise

 = turn rotary knob anticlockwise



*** Note !**


During programme run (indicated by the flashing of the LED **prog**) it is impossible to change the selected parameters.




Therefore the menu item **EDIT** is replaced by **VIEW**.

By selecting **VIEW / YES** the adjusted parameters can be checked but not changed.

➤➤➤  In the menu item **PROG** the programme can be started or stopped

➤➤➤  In the **EDIT** submenu the programme can be set up or changed (see chapter **Editing the programme**)

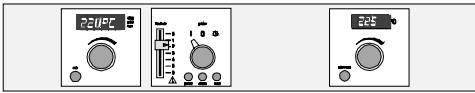
➤➤➤  ➤➤➤  ➤➤➤  **

➤➤➤  Selecting **YES** in the menu item **SETUP** opens the submenu for the controller configuration settings. (see chapter **Working controller module**).

** The menu item **PRINT** is used for selecting the print-out options on the parallel printer interface (see chapter **The parallel printer interface**). Selecting **LIST** produces a listing of the printer program if a printer is connected..

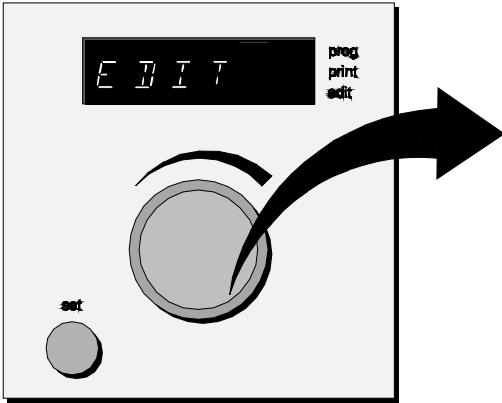
Note ! If a programme run has been interrupted through interruption of the supply or through switching off the oven, restoring the supply causes the programme to continue automatically from the point where it was interrupted.

In this case the programme time is extended by the duration of the interruption and there may be an **additional** time error of 5 minutes max.

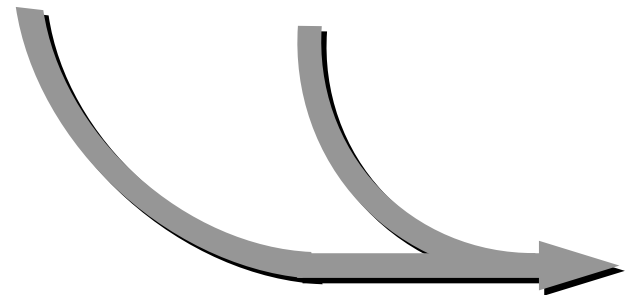


9.3 Editing the programme / EDIT submenu

The programming submenu is opened by selecting **YES** in the menu item **EDIT** (or **VIEW** during programme run). The parameters for each programme segment (max. 9) are set here: Duration (*time*), final temperature of the segment (*Temp*), speed of the fan (*Fan* -if applicable) and the segment end command . The status LED **edit** indicates that the controller is in the **EDIT** submenu.



Menu items



Use of turning the rotary knob:

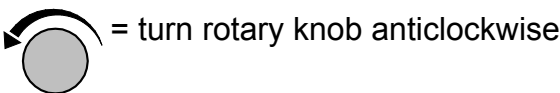
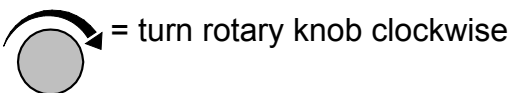
Without set button:

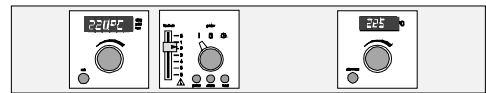
- selection of the menu item

TIME
DATE
YEAR
FEED
ADRES
TYPE
EXIT

Together with set button:

- **press:** set point is displayed (temperature or time, decimal point is flashing)
- **hold down:** displayed value can be changed with the rotary knob.
- **release:** value is stored in memory





The dynamic operating menu only shows as many programme segments as programmed, i.e. until a programme segment is closed with a programme end command (**LOOP, HOLD, END**). If the programme end command of the existing last programme segment is replaced by **NEXT** or **SP.WT.** an additional programme segment is added (up to 9 segments).

Note: The return from any menu to the actual temperature is achieved by selecting the menu item **EXIT** or occurs automatically after 30 sec.

➤➤➤ In the menu item **TIME** the duration of the programme segment (example: Ramp I) is programmed.

➤➤➤ With the parameter **TEMP** the final temperature of the segment is set (example: Ramp I).

➤➤➤ For ovens with a fan, **FAN** serves to pre-set the speed of the fan in occurs in 10 % stages. **OFF** means: fan is switched off completely.

➤➤➤ **FLAP** serves to pre-set the air flap in 10% stages.

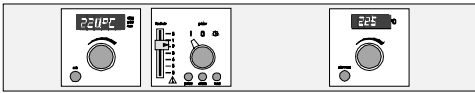
➤➤➤ Segment end commands.

After selection of the segment end command **NEXT** or **SP.WT** a further programme segment is shown and the parameters can be adjusted as described above.

⋮

➤➤➤

EXIT serves to leave the **EDIT** submenu. By selecting **NO** it is possible to remain in the submenu. If **YES** is selected you leave the **EDIT** level and the present temperature is shown.



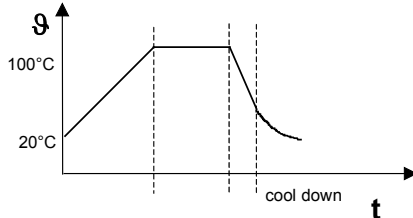
9.4 Segment end command

The programme segments are connected by a segment end command. The end commands determine the programme flow. They also determine how many programme segments are displayed during the programming procedure.



"End of the programme"

Printer (if connected) stops printing

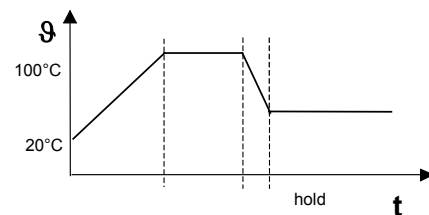


○ programme flow:

At the end of the programme the heating is switched off and all parameters (e.g. fan) are set to the default value. No further programme segment accessible.



"Hold all settings at the end of the programme"



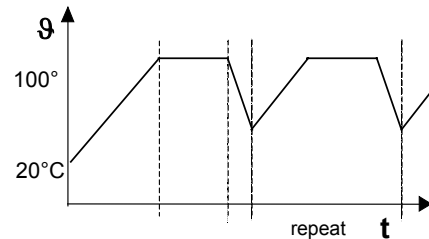
○ programme flow:

The parameters of the last segment are held at the end of the programme. No further programme segment accessible.

Printer (if connected) continues.



"Loop function"



○ programme flow:

The programme is repeated n times (n = 1 ... 99).

LP. 1 x ... LP. 99 x

the number of the repetitions can be set in the menu item LP:

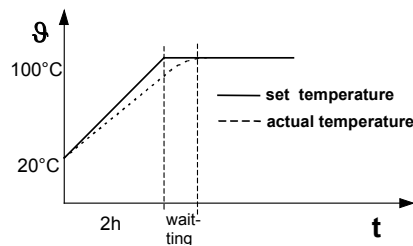
LP.CONT

continuous programme repetition until the programme is stopped manually.

A connected printer moves on.



"SETPOINT WAIT" = wait for the setpoint temperature



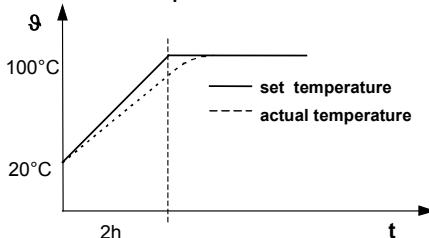
○ programme flow:

At the end of the present segment, the programme waits until the set temperature is reached. Then the programme then continues with the next segment. The next programme segment can be programmed.

A connected printer moves on.



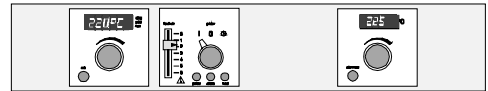
"Go to the next programme segment"



○ programme flow:

At the end of the present segment, the next programme segment follows immediately. The next programme segment can be programmed.

A connected printer moves on.



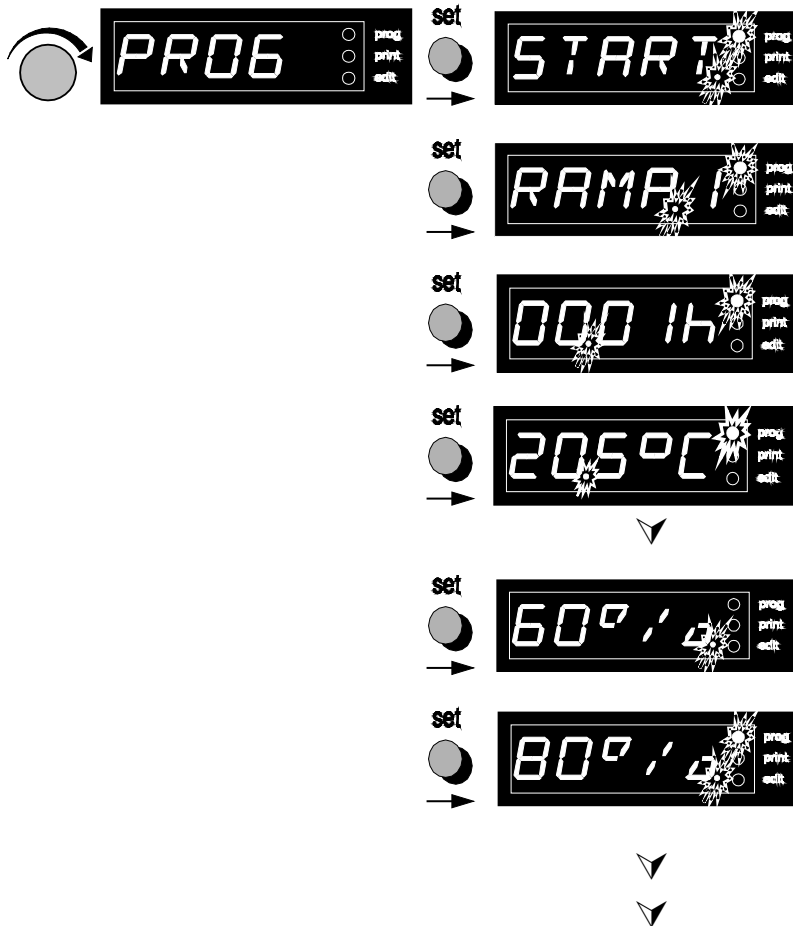
10 Programme start

A programmed temperature profile can be started as described in the chapter **Controller Module with main switch in position** .

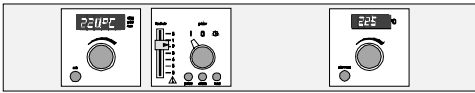
The LED **prog** on the display of the P-controller is flashing.

During the programme run it is impossible to change the selected parameters.

The current status can be shown on the controller display by pressing the **set** button

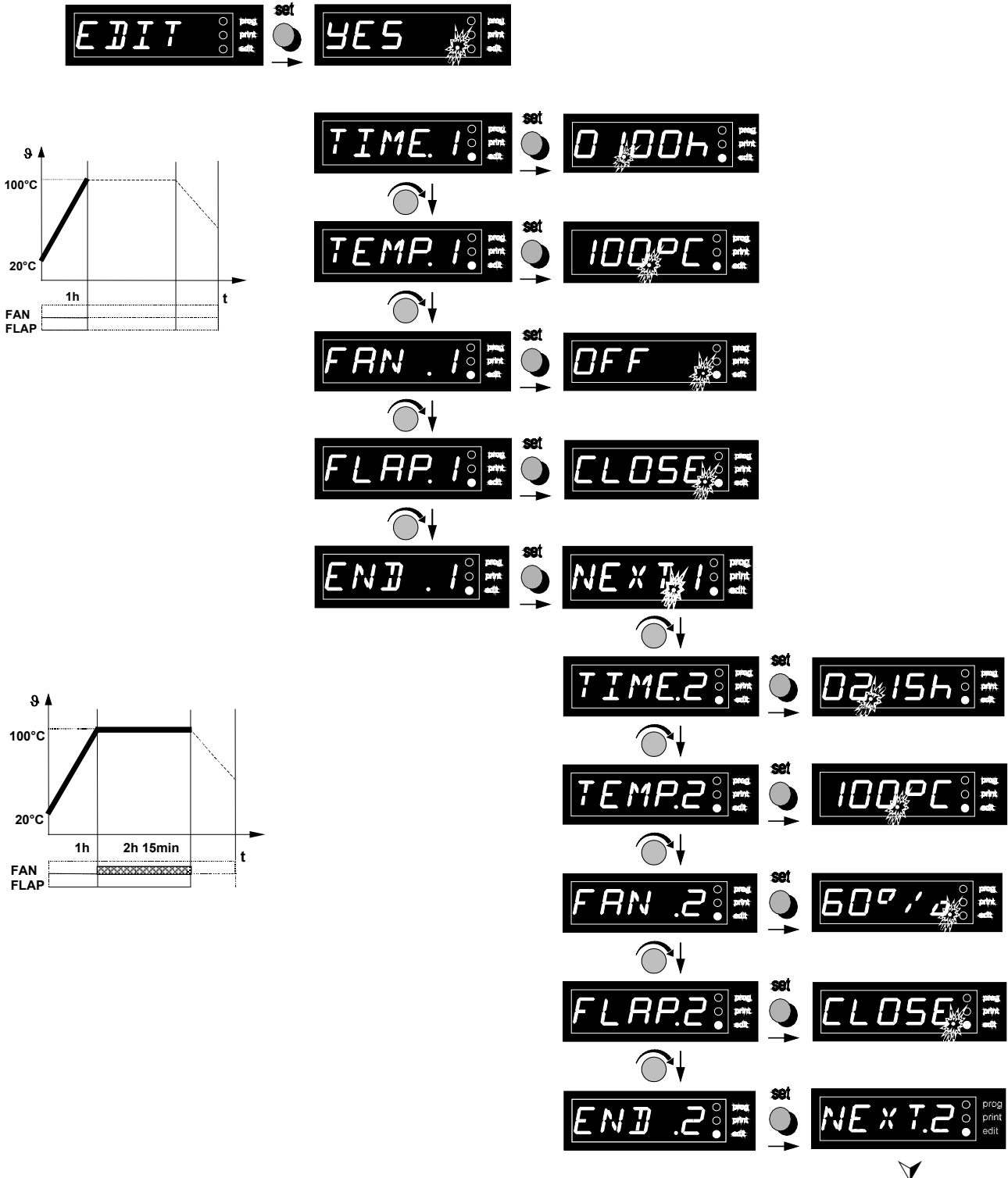


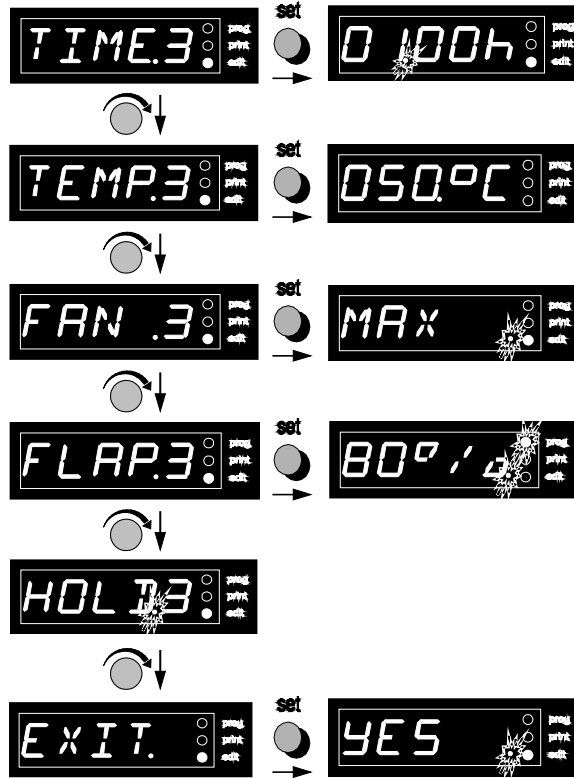
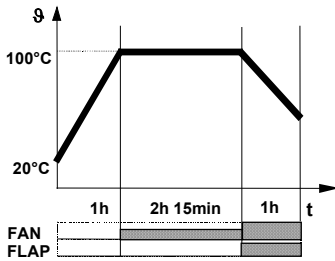
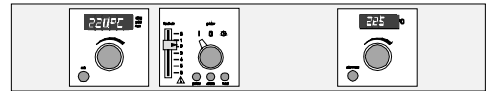
If there is no further action for a few seconds the controller display shows again the current actual temperature.

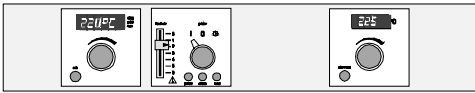


10.1 Programming example

- An oven with fan has to be heated to 100°C in one hour, with the air flap closed and with the fan switched off;
- then the temperature has to be held for exactly 2 hours and 15 minutes, the fan has to run at 60% speed and the air flap remains closed;
- the oven then cools down to 50°C in 1 hour, at maximum fan speed and with the air flap 80% open

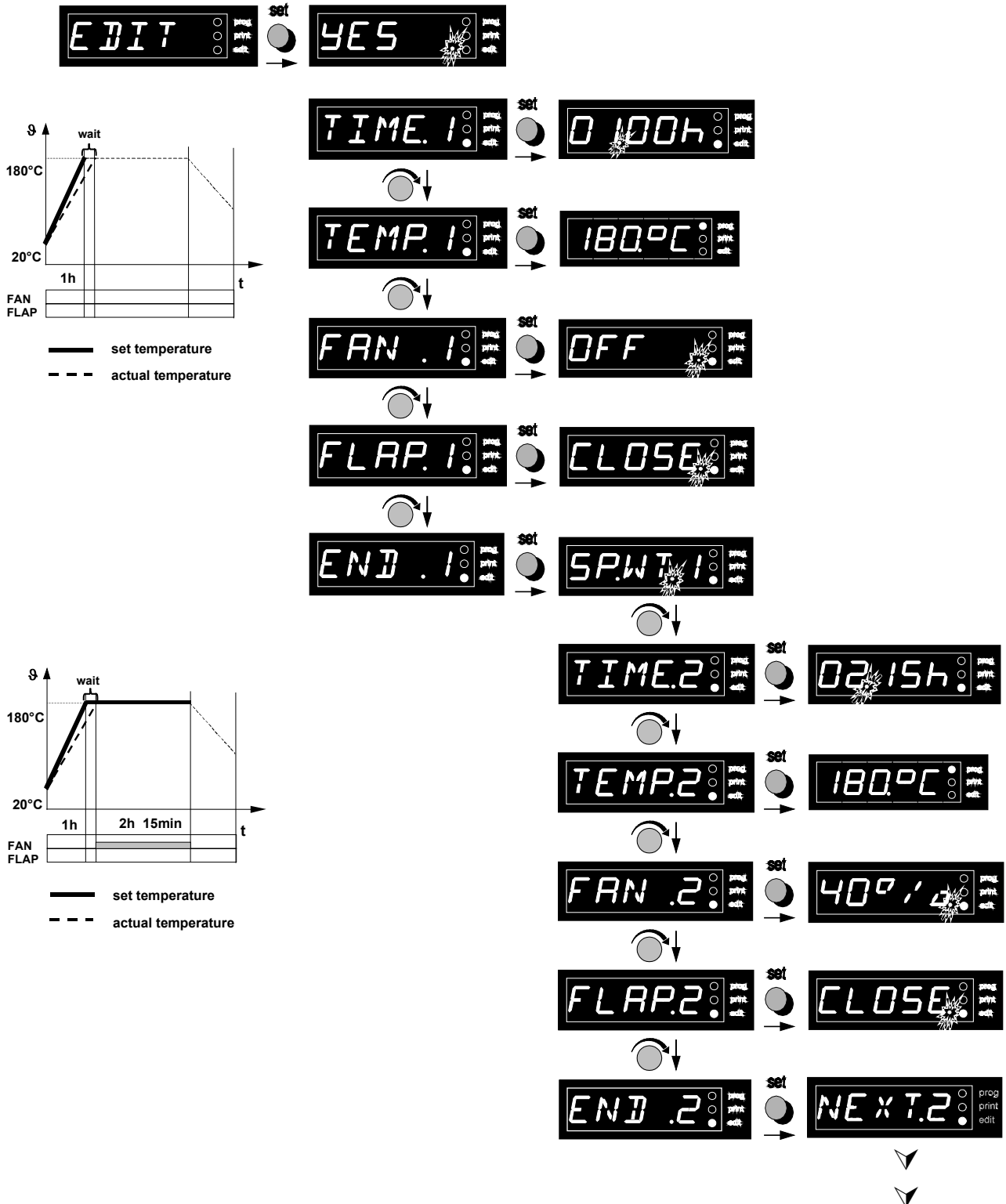


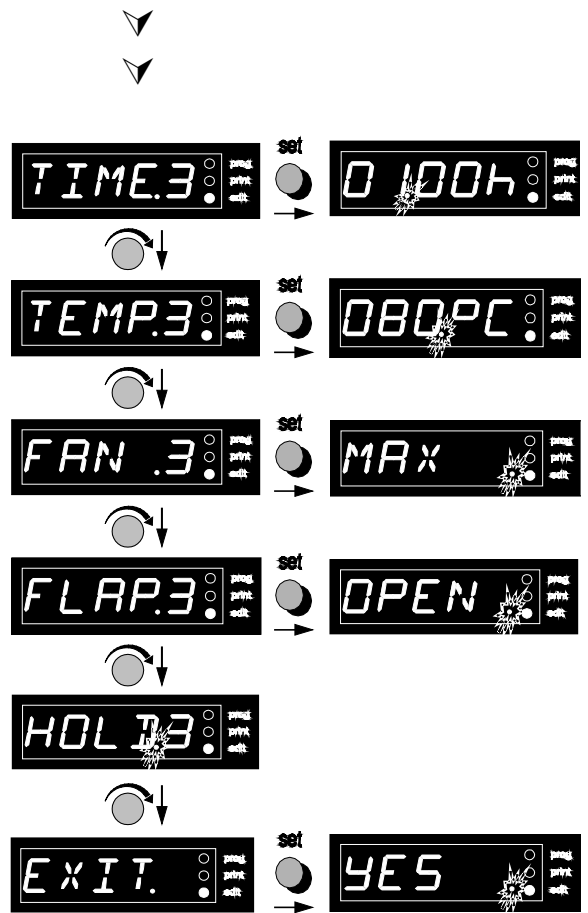
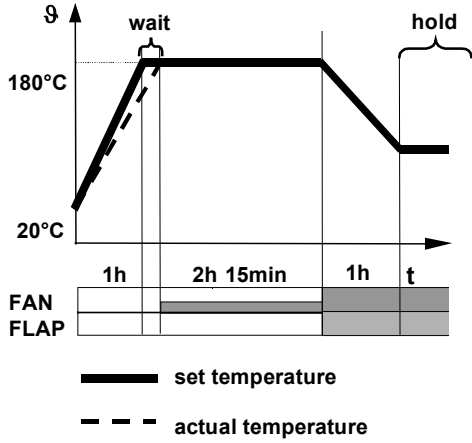
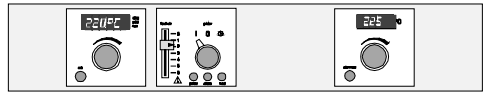


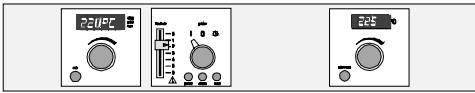


10.2 Programming example for setpoint-dependent operation

- An oven with fan has to heat up to 180°C in one hour, with the air flap closed and the fan switched off;
- **on reaching the set temperature** it has to hold it for exactly 2 hours and 15 minutes, with the fan running at 40% speed and the air flap closed;
- the oven then has to cool down to 80°C in 1 hour at maximum fan speed. The 80°C temperature is then held, with the air flap open.







11 The MEMMERT software „Celsius 2000“

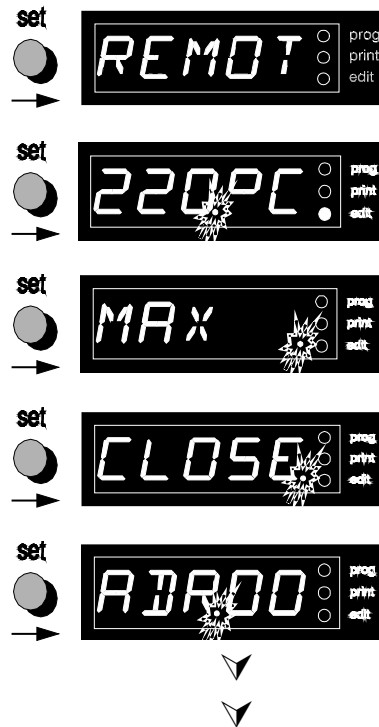
Using the „Celsius 2000“ program:

- the P-controller can be programmed from the PC and the programme run can be started,
- the Memory Card XL can be programmed and the programme run can be started,
- a temperature programme on the Memory Card XL can be overwritten by a new programme sequence,
- programmes and actual temperature profiles on a Memory Card XL can be loaded, shown on the screen, and stored on another storage medium (hard disk, diskette),
- several ovens can be controlled through one or several interfaces and the current actual data can be documented,
- temperature programmes can be created as graphic or table on the PC, changed and stored.
- Temperature recorder function without set-temperature control function.

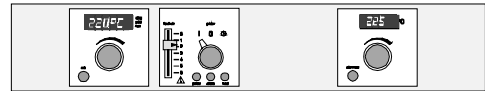
Details on installation and operation of the MEMMERT software
„Celsius 2000“
 are given in the enclosed user manual.

As soon as a temperature programme has been started with „Celsius 2000“ it is no longer possible to change the set parameters on the P-controller.

The current status can be shown on the controller display by pressing the **set** button.



If there is no further action for a few seconds the controller display shows again the current actual temperature.

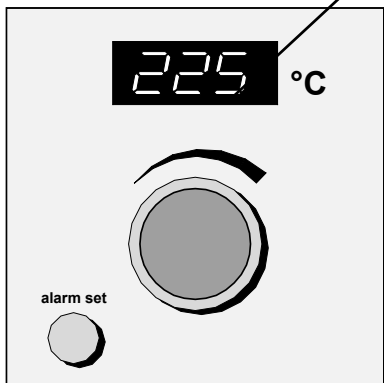
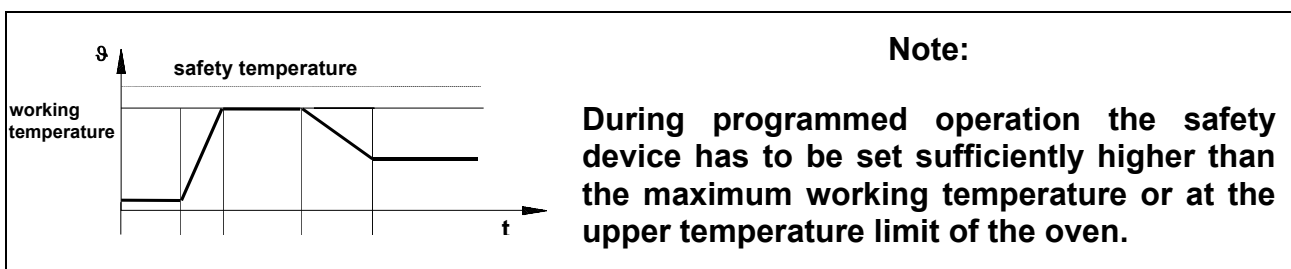


12 Safety devices

12.1 Adjustable overheat controller (TWW), Class 3.1 in accordance with DIN 12880 or adjustable temperature limiter (TWB), Class 2 in accordance with DIN 12880

Adjustable overheat controller (TWW), Class 3.1 and adjustable temperature limiter (TWB), Class 2, work independently of the temperature control system in accordance with DIN 12880.

The safety devices should be checked at regular intervals, e.g. once a month, once the oven has stabilised at the desired temperature. To perform this safety check, reduce the setting of the safety device until the red control light in the main switch module comes on. After that, the safety device can be set again.

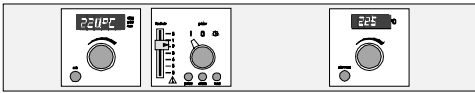


Protection of the load against overtemperature:

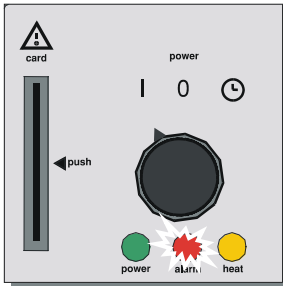
- Using the control knob, set the adjustable overheat controller to a reasonable amount (e.g. 5°C)
- The display always shows the set temperature of the TWW or TWB.
- After the temperature has stabilised, the setting of the TWW or TWB should be moved down using the control knob until it just does not operate. This provides improved protection of a sensitive load against overtemperature in case of failure of the working temperature controller. (approx. 3°C; approx. 0,5 °C on incubators)
- This lowering of the setpoint to just above the actual stabilised temperature should take place **very slowly**, one degree at a time.
- **Warning!** Excessively close adjustment of the TWW/TWB can cause unintentional operation release if the oven is disturbed (e.g. opening of the door).

Note:

- Changing the displayed setpoint is only possible if the **alarm set** button is held down at the same time. This avoids unintentional changes.
- Turning the rotary knob rapidly changes the setpoint in large steps; turning it slowly changes the setpoint in single steps.



Should the temperature rise above the set working temperature,



- The adjustable overheat controller TWW takes over the temperature control, if the set safety temperature is reached.
- The adjustable temperature limiter TWB switches off the heating and must be reset by pressing the „alarm set“ button
- The "alarm" lamp lights up
- The working controller shows "*ALARM* "

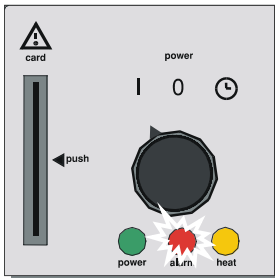
In this case please check the TWW or TWB as described and readjust it if necessary. If there should be a fault please contact an authorised service station for Memmert equipment.

12.2 Temperature limiter (TB), Class 1 in accordance with DIN 12880

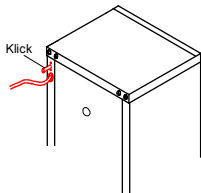
In addition to the TWW or TWB this unit is equipped with a factory- set temperature limiter TB (protection Class 1 according to DIN 12880), which under all conditions ensures protection of the unit and the environment.

In case of failure of the working controller and of the TWW or TWB the TB operates when the factory temperature setting is exceeded.

Should the temperature rise above the set safety temperature, the temperature limiter switches off the heating.



- The "alarm" lamp lights up
- The working controller continues to display the actual temperature.
- Units with fan: the fan keeps running.



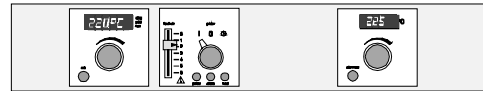
- In this case please reset the TB by pressing the red button, located on the rear side of the unit (next to the power cord) after the unit has cooled down. Press until you hear a "click" sound.

If there should be a fault please contact an authorised service station for Memmert equipment.

12.3 Possible problems during the first run

If the unit is exposed for longer periods to temperatures below freezing or to strong mechanical shocks which may occur during transport, the temperature limiter may have been activated.

In this case please reset the TB as described above.



13 Loading



Units described in this instruction manual must not be used for drying or heating substances giving off vapours or gases which are inflammable when mixed with air.

The units described here must never be operated in areas with an explosive atmosphere.

For correct operation and uniform temperature distribution it is essential to maintain free air circulation throughout the oven. The contents of the oven should therefore not be packed tightly, furthermore they must not be placed close to any of the heating ribs on the sides, top or bottom of the oven (note the loading diagrams on the ovens).

When putting the shelves into the unit please ensure that there is a small air gap between the rear of the working chamber and the shelf in order to permit better air circulation.

For the maximum number of shelves and the permissible load see table below.

If the load is packed tightly and the ventilation slide is fully open, the oven may take a very long time to reach the set temperature

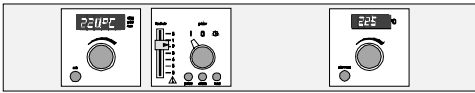


Warning !

When the oven is started up for the first time it should be run under supervision until steady conditions are reached.

The following schedule gives recommended loading levels which will ensure largely uniform temperature distribution within the working chamber.

Model	Max. number of shelves	Load each shelf max. kg	Total load kg
400	4	30	90
500	5	30	60
600	7	30	80
700	8	30	100
800	10	30	160



14 Sterilisers

14.1 Application

The apparatus is used for sterilising medical materials by employing dry heat through hot air at atmospheric pressure

14.2 Instructions for sterilisation in MEMMERT hot-air sterilisers.

There are many different specifications for hot air sterilisation; they cover temperatures and sterilisation times to be selected as well as the packaging of the sterilisation goods. The actual details depend on the nature of the goods to be sterilised and on the type of germs to be deactivated. Please make yourself familiar with the appropriate specification for your application before carrying out a sterilisation with your MEMMERT unit.

Some examples of the correct preparation of different medical instruments are shown in the following table:

Load	Preparation
Instruments with no soft-soldered parts	Place the cleaned instruments double-wrapped in aluminium foil (recommended)
Sharp instruments or blades	Place the cleaned instruments, twin-packed in aluminium, foil (recommendable)
Modern syringes	Place barrel and plungers (separately) double-wrapped in aluminium foil (recommendable)
Glass and glass instruments	Disassemble the cleaned glass containers and glass syringes. Place on trays and cool down slowly

Bottles and similar items must be sterilised with the opening pointing downward in order to prevent the development of cold air pockets. Organic materials (e.g. cork) must not be used as closing material for containers.

180°C is usually recommended as sterilising temperature (cf. e.g. German Pharmacopoeia DAB 10 or other national standards).

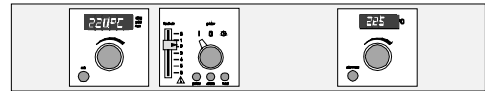
In sterilisation, set-point- dependent operation should always be used in accordance with example 14.2. The total hold time consists of the equilibration time (i.e. the time it takes until the desired temperature is reached at every point inside the working chamber), together with the actual sterilisation time and an additional safety time.

The following table shows guidance values for the hold time to be set on the controller, depending on the weight of the sterilising load, for units with and without fan. Please note that these data apply only for correct and loose loading. Information on the correct loading of the unit are given in this operation manual and on the adhesive label directly on the unit.

Sterilisation temperature 180°C	Weight of the load					
	low		medium		high	
	without fan	with fan	without fan	with fan	without fan	with fan
Unit size						
400	1.10 h	1.00 h	1.50 h	1.20 h	2.00 h	1.50 h
500	1.10 h	1.00 h	1.50 h	1.20 h	2.00 h	1.50 h
600	1.30 h	1.00 h	2.20 h	1.30 h	2.20 h	2.20 h
700	1.30 h	1.00 h	2.20 h	1.30 h	2.20 h	2.20 h
800	1.40 h	1.10 h	2.20 h	1.40 h	2.50 h	2.20 h


The sterilisation time has to be multiplied by approximately 4 if a sterilisation temperature of 160°C is selected.

With large units and heavy loads, the use of wire trays (option) is recommended instead of the perforated shelves.



In particular with heavy loads, these approximate values should not be used without proper testing. In order to ensure safe sterilisation the individual sterilisation process must be validated, using e.g. additional temperature sensors or germ packets.

During sterilising the air flap has to be closed after the moist load has been dried.

	<p style="text-align: center;">WARNING!</p> <p style="text-align: center;">Models 700 and 800 are fitted with a door closure mechanism incorporating a lock. If the user, against our express warning, enters the interior of the steriliser it is essential that he first pulls off the key and keeps it on his person.</p>
---	--

14.3 Notes on working with sterilising cassettes:

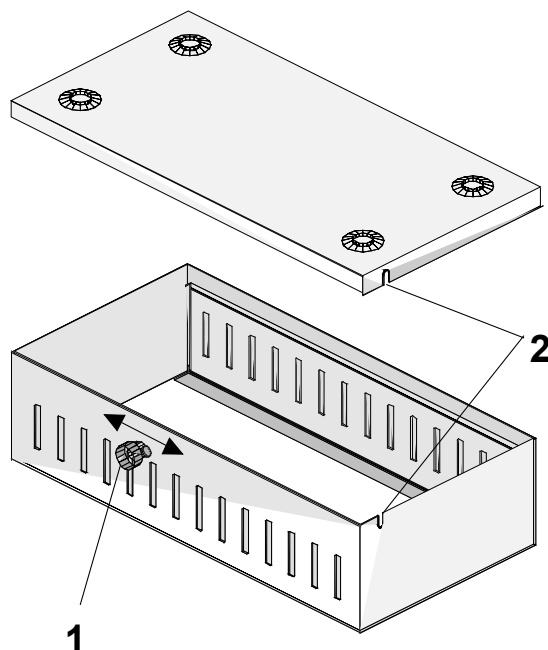
The cassettes should be placed in the unit so that the hot air can flow freely through the air slots (in an oven with fan the air stream flows crosswise through the working space). The instructions about correct loading, which can be found in this operating manual and on the unit, must also be observed when using sterilising cassettes. This makes sure that proper temperature distribution is achieved and that the development of cold air pockets is prevented.

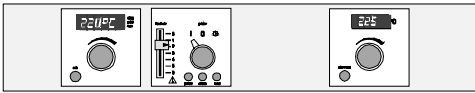
The sterilisation load must be packed in aluminium foil as shown in the table and must be placed in the sterilising cassettes. The air slots of the cassette **must be opened** for sterilising.

A temperature sensor for verifying the temperature can be placed into the sterilising cassette through opening 2.

After the sterilising time has elapsed, the air slots **must be closed** by shifting knob 1 in the direction of the arrow.

This ensures that the sterilised goods can be preserved in the closed cassette for a few days.





14.4 Example of programming a sterilisation profile

- The following example shows a possible sterilisation profile. This example uses 60 min at a temperature of 180°C.
- To programme this temperature profile, select the submenu **EDIT**, with the main switch in position

— set temperature
- - - actual temperature

EDIT → **YES**

TIME.1 → **000 1h**

TEMP.1 → **180°C**

FAN.1 → **MAX**

FLAP.1 → **CLOSE**

END.1 → **SP.WT.1**

The temperature of 180°C has to be reached in 1 minute.

The fan motor runs at maximum speed.

The segment closing command *SP.WT.1* ensures that the sterilisation time begins only when the 180°C temperature has been reached.

— set temperature
- - - actual temperature

The sterilisation time has to be exactly 1 hour.

The fan motor runs at maximum speed.

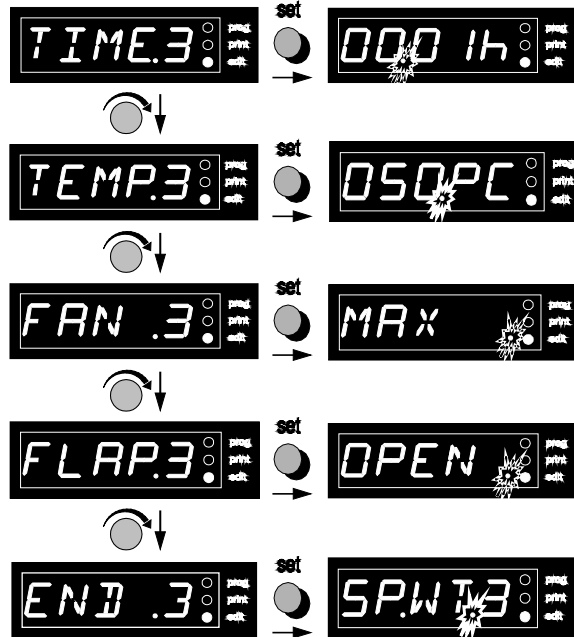
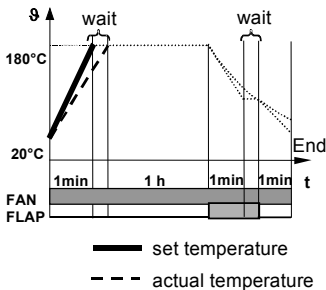
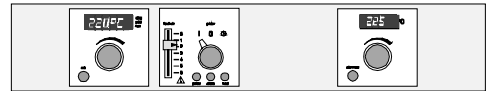
TIME.2 → **0 100h**

TEMP.2 → **180°C**

FAN.2 → **MAX**

FLAP.2 → **CLOSE**

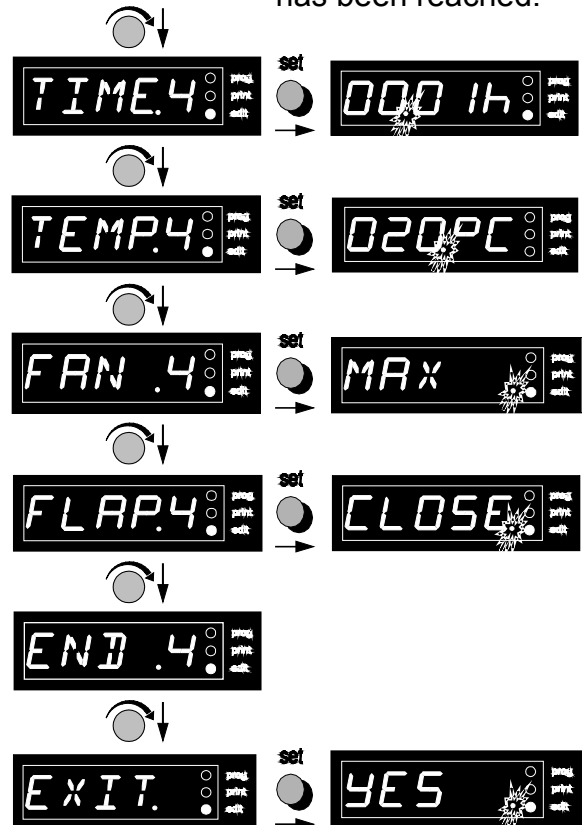
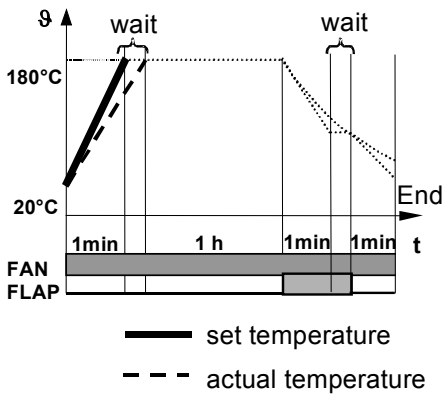
END.2 → **NEXT.2**



After the end of the sterilisation time the oven has to cool down to the 50°C unloading temperature in 1 minute.

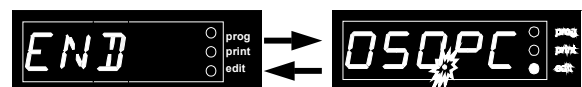
The fan motor continues to run at maximum speed.

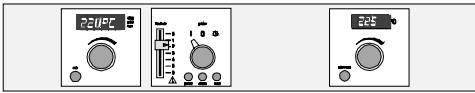
The segment closing command *SP.WT.3* ensures that the programme is only continued after the temperature of 50°C has been reached.



When the 50°C temperature has been reached, the display after 1 minute shows *End* alternating with the actual temperature. The load can now be removed.

The fan motor continues to run at maximum speed.





15 Maintenance

General information Memmert ovens require minimal servicing. It is recommended that the moving parts on the doors (hinges and door lock) should be lubricated with thin silicone grease once a year (with continuous use 4 times a year).

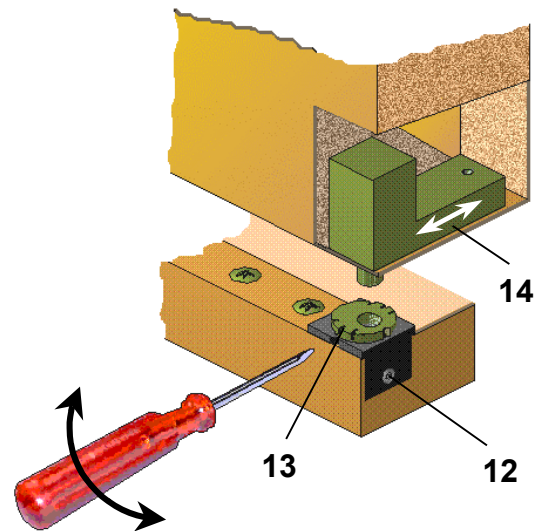
In case of a malfunction which makes the opening of the unit necessary this work has to be performed by a qualified service engineer.

A tightly closing door is an essential requirement for proper operation of the oven. MEMMERT ovens require perfectly tight closing of the door through a seal on the oven casing. The door seal presses accurately against the casing seal. In continuous operation the flexible seal material may acquire a permanent set. For proper closing of the door it may be necessary to adjust the hinge or the locking plate.

15.1 Readjusting the door

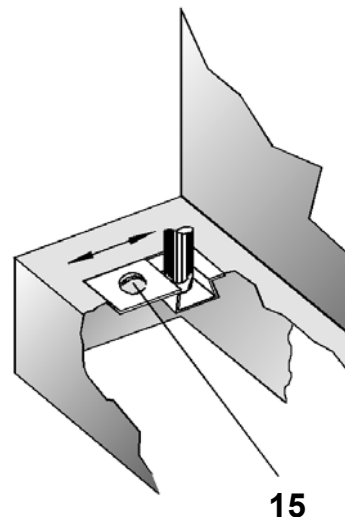
After releasing the screw No.12 (**NOTE!** Screw No. 12 is secured with adhesive. Loosen it by a sharp tug with a hexagon socket key wrench 2 mm) the door can be adjusted by turning the eccentric 13 in the direction of the arrow (using a screwdriver). Tighten screw No. 12 again.

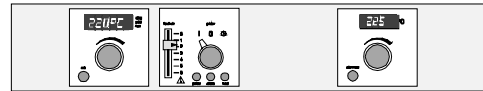
In addition the upper part No.14 of the door hinge can be moved slightly in the direction of the arrow after releasing the 2 screws at the top or bottom of the door.



The locking plate can also be readjusted in the direction of the arrow after releasing the screw No.15.

Ensure that the locking plate is again screwed down tightly.





16 Cleaning



Regular cleaning of the (easy to clean) interior prevents the formation of deposits which may impair the appearance and function of the oven.

The unit can be cleaned with a commercial stainless steel cleaning agent. Please note that objects liable to rust must not be placed into the interior. Rust deposits lead to contamination of the interior or the external casing.

If any rust stains appear on the interior surfaces through contamination, the affected areas must be cleaned and polished immediately.

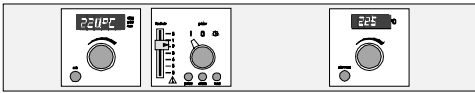
Warning !

Do not use cleaning fluids containing scouring agents or solvents for cleaning the operating module, the plastic trims or other plastic parts.

17 Check list for rectifying faults

<u>Fault</u>	<u>Cause</u>
Main switch in position I, green lamp in main switch module remains dark	Equipment not connected Lamp faulty Main fuse defective
No temperature indication on the display	Microfuse defective T32mA 250 V~ on circuit board 55139.x
Yellow lamp in main switch module remains dark	Ambient temperature too high, working temperature in oven higher than the working temperature set with rotary knob (setpoint). Lamp faulty
Red lamp in main switch module alight	Temperature safety device is actuated (see chap. Safety device).
Display: "ERR- 1" in working controller module	TRIAC component defective, send controller back to Memmert for exchange.
Display: "ERR- 2" in working controller module	Power board defective, send controller back to Memmert for exchange.
Display: "ERR- 3" in working controller module	Pt100 defective
Display: "ERR- 4" in working controller module	Internal configuration error, turn off the oven, then turn it back "on".
Display: "ERR- 7" in working controller module	Wrong chip card or Memory Card XL inserted incorrectly. Insert correct Memory Card XL or insert in direction of arrow.
Display: "ERR- 8" in working controller module	Memory Card XL not correct for <u>oven type</u>. Insert the correct Memory Card XL for the <u>oven type</u> .

In case of a malfunction contact an authorised service station for Memmert equipment or please inform the Memmert service department.

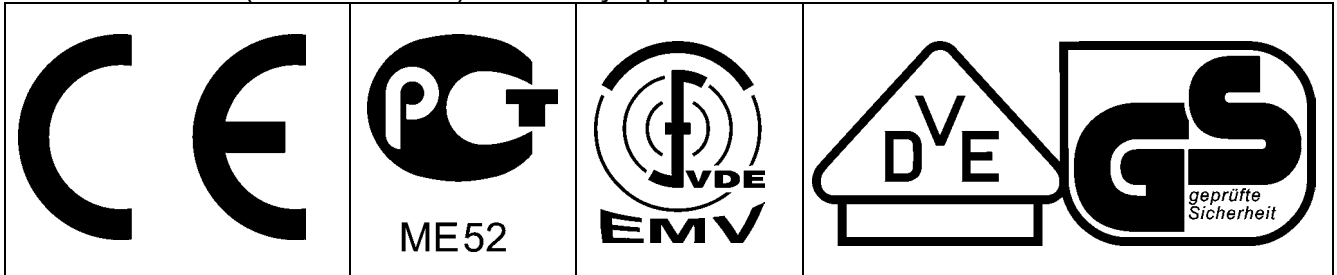


The details in these Operation Instructions must be carefully observed in order to ensure satisfactory operation.

Any warranty and claims for damage are excluded if these instructions are disregarded.

**We reserve the right to make changes in technical specifications.
Dimensions subject to confirmation.**

Standard ovens (UP / ULP / BP) are safety-approved and bear the test marks:



Sterilisers (SLP) are safety-approved and bear the test marks:



18 Our Address



MEMMERT GmbH+Co.KG
P.O.Box 17 20, 91107 Schwabach
Federal Republic of Germany

☎: +49 9122 / 925-0

Fax: +49 9122 / 14585

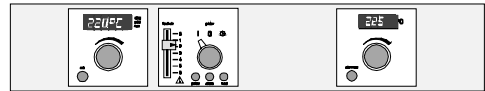
Internet: www.memmert.com

Direct dialling-in service department:

☎: +49 9122/925-143

E-Mail: service@memmert.com

© by MEMMERT GmbH+Co.KG



EC Declaration of Conformity

Manufacturer's name and address: MEMMERT GmbH + Co. KG
Äußere Rittersbacher Straße 38
D-91126 Schwabach

Product: Universal oven

Type: UM ... / ULM ... / UE ... / ULE ... / UP ... / ULP ...

Sizes: 100 / 200 / 300 / 400 / 500 / 600 / 700 / 800

Nominal voltage: AC 230 V or 3 ~ AC 400 V 50 / 60 Hz
alternative AC 115 V 50/60 Hz

The designated product is in conformity with the European EMC-Directive

89/336/EEC
including amendments

Council Directive of 03 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Full compliance with the standards listed below proves the conformity of the designated product with the essential protection requirements of the above-mentioned EC Directive:

DIN EN 61 326 (VDE 0843 part 20): 1998-01	EN 61 326: 1997
DIN EN 61 326/A1 (VDE 0843 part 20/A1): 1999-05	EN 61 326: 1997/A1 : 1998
RFI suppression: Class B	
DIN EN 61 000-3-11 (VDE 0838 part 11): 2001-04	EN 61 000-3-11: 2000

The designated product is in conformity with the European Low Voltage Directive

73/23/EEC
including amendments

Council Directive on the approximation of the laws of the Member States relating to Electrical equipment for use within certain voltage limits.

Full compliance with the standards listed below proves the conformity of the designated product with the essential protection requirements of the above-mentioned EC Directive:

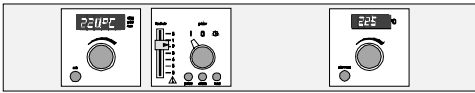
DIN EN 61 010-1 (VDE 0411 part 1): 1994-03	EN 61 010-1: 1993
DIN EN 61 010-2-010 (VDE 0411 part 2-010): 1995-03	EN 61 010-2-010: 1994

Schwabach, 20.03.03



(Legally binding signature of the issuer)

This declaration certifies compliance with the above mentioned directives but does not include a property assurance. The safety note given in the product documentation which are part of the supply, must be observed.



EC Declaration of Conformity

Manufacturer's name and address: MEMMERT GmbH + Co. KG
Äußere Rittersbacher Straße 38
D-91126 Schwabach

Product: Steriliser

Type: SM ... / SLM ... / SE ... / SLE ... / SLP ...

Sizes: 100 / 200 / 300 / 400 / 500 / 600 / 700 / 800

Nominal voltage: AC 230 V oder 3 ~ AC 400 V 50 / 60 Hz
alternative AC 115 V 50/60 Hz

The product meets the regulations of the directive

93/42/EWG

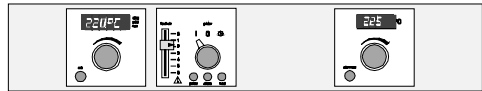
Directive of the council to adapt legal regulations of the member states on the subject of medical products dd. 14.06.1993 (Abl. EG Nr. L 169, S. 1, 12.07.1993) including annex and modifications.

Schwabach, 20.03.03



(Legally binding signature of the issuer)

This declaration certifies compliance with the above mentioned directives but does not include a property assurance. The safety note given in the product documentation which are part of the supply, must be observed.



EC Declaration of Conformity

Manufacturer's name and address: MEMMERT GmbH + Co. KG
Äußere Rittersbacher Straße 38
D-91126 Schwabach

Product: Incubators
Type: BE ... / BP ...
Sizes: 200 / 300 / 400 / 500 / 600 / 700 / 800
Nominal voltage: AC 230 V 50/60 Hz
alternative AC 115 V 50/60 Hz

The designated product is in conformity with the European EMC-Directive

89/336/EEC
including amendments

Council Directive of 03 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Full compliance with the standards listed below proves the conformity of the designated product with the essential protection requirements of the above-mentioned EC Directive:

DIN EN 61 326 (VDE 0843 part 20): 1998-01	EN 61 326: 1997
DIN EN 61 326/A1 (VDE 0843 part 20/A1): 1999-05	EN 61 326: 1997/A1 : 1998
RFI suppression: Class B	
DIN EN 61 000-3-11 (VDE 0838 part 11): 2001-04	EN 61 000-3-11: 2000

The designated product is in conformity with the European Low Voltage Directive

73/23/EEC
including amendments

Council Directive on the approximation of the laws of the Member States relating to Electrical equipment for use within certain voltage limits.

Full compliance with the standards listed below proves the conformity of the designated product with the essential protection requirements of the above-mentioned EC Directive:

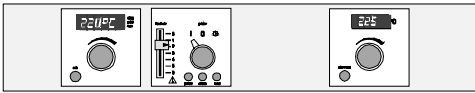
DIN EN 61 010-1 (VDE 0411 part 1): 1994-03	EN 61 010-1: 1993
DIN EN 61 010-2-010 (VDE 0411 part 2-010): 1995-03	EN 61 010-2-010: 1994

Schwabach, 20.03.03



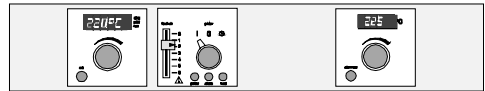
(Legally binding signature of the issuer)

This declaration certifies compliance with the above mentioned directives but does not include a property assurance. The safety note given in the product documentation which are part of the supply, must be observed.



19 Index

.....pagepage
A	
address	16
Address	43, 44, 45
Address allocation	21
Adjustable overheat controller	33
adjustable temperature limiter	33
Ambient conditions	6
C	
CELSIUS 2000	12
check list	5
Check list for rectifying faults	41
Cleaning	41
Communication protocol	16
Computer connection	16
continuous operation	18
D	
date	20
DATE	15
Display	14
Documentation	13
Drehgeber	24
E	
EDIT	23, 25
Editing the programme	24
Electrical supply	6
End	26
E R R - 1	41
E R R - 2	41
EXIT	20, 25
Explanation of symbols	4
F	
fan	5, 6
FAN	15, 19
feed	20
FLAP	15, 19
G	
General safety instructions	4
Glossary	47
GLP* header data	15
Graphic print	15
graphic printout	14
H	
HOLD	26
I	
Installation options	8
Integrated real-time clock	14
Interface RS232C	16
Interface RS485	17
interruption of the supply	23
L	
line feed	21
LIST	23
Loading	35
locking plate	40
loop	26
M	
Main menu	11
Main switch	11
Main switch module	10
Maintenance	40
MEMory Card	10, 12, 32
N	
NEXT	25, 26
Numerical print	15
O	
Operating the door	9
Overheat safety device	6
P	
parallel printer interface	5
parallel printer interface	14
PID process controller	5
Print deactivated	15
printer mode	20
Printer mode	15
PROG	23
program version	22
programme mode	22
programme segments	25
Programme start	27
programmed operation	10
Programming example	28
Programming via the process controller	12
Protection of the load	33
Putting into operation	9
Q	
Quality of material	7



R

Readjusting the door	40
real-time clock.....	20
RS232/RS485 converter.....	17
RS232C interface	5
Rust deposits	41

S

Safety devices	33
Segment end command	26
Segment end commands.....	25
Segmentabschlussbefehle.....	15
self-diagnostic system	5
Serial communication interface	16
serial interface	13
set button.....	27
setpoint-dependent operation.....	30
Setting temperature range.....	6
SETUP	16, 20
shelves.....	35
slot for MEMory Card.....	10
software	32
SP.WT	25, 38, 39
Stacking device.....	8
sterilisation.....	36
sterilisation profile	38
sterilisation time	36
sterilising cassettes	37

Storage volume for protocol data	12
subframe	8
Submenu.....	11
Submenu SETUP.....	20

T

TB	6, 34
temp	4
TEMP	15, 19
Temperature limiter.....	34
temperature profile.....	27
TIME	15
Transport	4
TWB	6, 33
TWW	6, 33

V

VIEW	24
------------	----

W

Wall fixing, hole pitches for for wall fixing	8
Wall mounting	8
Working controller module	11, 18
Working temperature range	6
Write protection	12
write/read device	5, 13

Glossary:

- **nominal temperature** = the maximum adjustable setpoint temperature of the oven.
- **ambient temperature** = the continuous temperature of the room in which the oven is set up.
- **set point-dependent operation** = the integrated digital timer for the gold time does not start until temperature in the chamber has reached the setpoint to within at least 0,5 °C at 70 °C nominal temperature or 2 °C at 220/300°C nominal temperature.
- **steady-state condition** = the selected setpoint temperature has been reached and remains stable, i.e. the actual temperature has remained unchanged for at least 5 minutes.

