memmert

Die Profis in Sachen Temperierung

VO COOL

AtmoSAFE

OPERATING INSTRUCTIONS

Vacuum oven with Peltier cooling

VO COOL 200
VO COOL 400

Pump Module

PM 200
PM 400

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2 General notes and safety notes

You have purchased a technically fully proven product which has been produced in Germany with the use of high-grade materials and the application of the latest manufacturing techniques; it has been factory tested for many hours.
In addition we guarantee the supply of spare parts over 10 years.

This mark in the Operating Instructions means:

Watch out
Important Note!

This mark on the product means:

Note Operating Instructions
Warning – oven hot when operating!

Observation of the Operating Instructions is necessary for faultless operation and for any possible claims under warranty. If these Instructions are disregarded, all claims under warranty, guarantee and indemnification are excluded!

The right to technical modifications is reserved.
Dimensional details are not binding.

2.1 Safety check

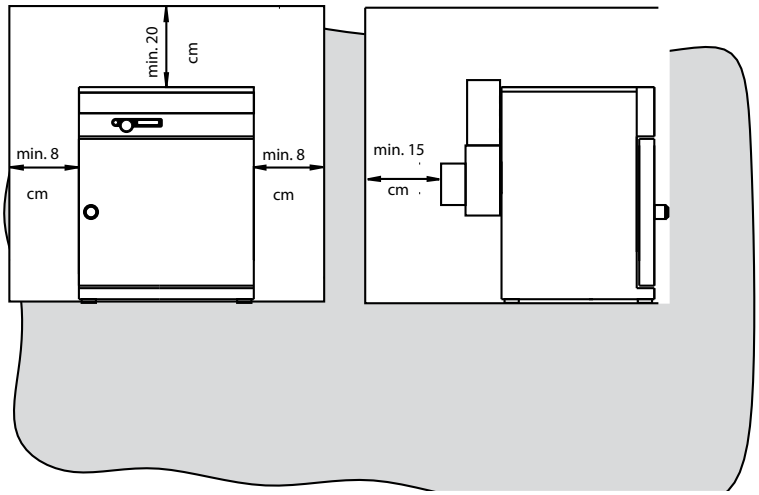
The door and the security glass panels must be checked regularly for scratches or damage. No vacuum must be applied to the oven if there is any damage.

2.2 Transport

Always use gloves!
If the oven has to be carried, at least 2 persons are required to transport it.

Do not place the oven on a readily inflammable support surface!
It is important that the oven is set up accurately horizontally!

3 Installation facilities (accessories)



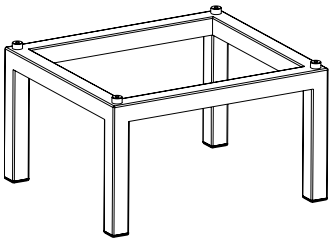
The oven can be placed on the floor or on a bench (working surface). It is important that the oven is set up accurately horizontally; the door may have to be adjusted (see Section: „Maintenance“)

The spacing from the back of the oven to the wall should be at least 15 cm. The spacing to the ceiling must not be less than 20 cm and that at the side to the wall not less than 8 cm. Generally it is essential to have adequate air ventilation around the oven.

Information on accessories will be found in our leaflet or on our internet page www.memmert.com. Please note the installation instructions for our accessories.

3.1 Subframe

Oven models 200 to 500 can be mounted on a subframe (accessory)



Oven on the floor

Oven on subframe

Oven on pump module

Oven on pump module and subframe

3.2 Initial start-up

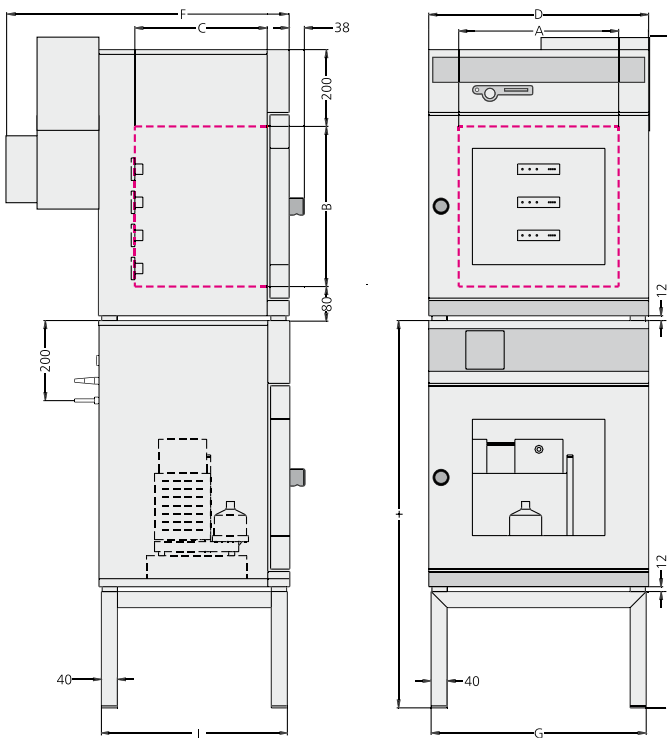
When the oven is started up for the first time, it should be supervised continuously until steady conditions have been reached.

3.3 Oven load

Full consideration must be given to the physical and chemical properties of your load (e.g. combustion temperature etc.) in order to prevent serious damage to load, oven and surroundings.
Please note that the MEMMERT ovens described here are not explosionproof (they do not conform to the Industrial Association Specification VBG 24) and are therefore not suitable for drying, evaporating and burning-in of paints, enamels or similar materials whose solvents may produce an inflammable mixture with air. There must be no possibility of the formation of inflammable gas/air mixtures either within the oven chamber or in the immediate surroundings of the equipment.
Large amounts of dust or corrosive fumes inside the oven chamber or in the surroundings of the equipment may produce deposits within the oven and lead to short-circuits or damage the electronics. It is therefore important that adequate precautions are taken against excessive dust or corrosive fumes.

In order to ensure proper air circulation inside the chamber, there must be sufficient spacing of the load inside the oven. Do not place any load on the floor, against the side walls or underneath the ceiling of the chamber (heating ribs). In order to ensure optimum air circulation the shelves must be so inserted that the air spacings between door, shelf and rear chamber wall are approximately equal.

4 Technical data



Model	200	400
Chamber width A [mm]	385	385
Chamber height B [mm]	305	385
Chamber depth C [mm]	250	330
Oven width D [mm]	550	550
Oven height E [mm]	605	685
Oven depth F [mm]	650	730
Width G [mm]	529	529
Height H [mm]	450	290
Depth I [mm]	383	463
Chamber volume [litre]	29	49
Weight [kg]	66	90
Power [W] Vacuum oven CDP Peltier cooling unit	 1200 160	 2000 160
Effective cooling capacity (W)	115	
Max. load per appliance [kg]	40	60
Ambient conditions	Ambient temperature 5°C to 40°C rH 80% max., no condensation Overvoltage category: II Contamination level: 2	
Setpoint temperature range	5 °C – 90 °C, optionally –5 °C – 90 °C 5 mbar – 1100 mbar	
Setting accuracy	0.5°C / 1mbar	
Operating temperature range	From 5° C to 200° C (including ambient temperature)	
Working temperature range	From 5°C above ambient temperature up to 200°C	
Leakage rate	max. 0.5 x 10^{-2} mbar 1/sec	

4.1 Standard equipment of VO ovens (basic variation)

- Electronic fuzzy-supported PID process controller with permanent power matching and time-saving auto-diagnostic system for rapid fault finding (see section: "Error messages")
- Language selection
- Alphanumeric text display
- Internal log memory with 1024 kB for storing actual temperature, temperature setpoint, vacuum and error states with time stamp
- Control of oven and logging of actual temperature values on MEMoryCard XL
- Programme sequence control for up to 40 ramp segments
- Vacuum pressure control for digital operation of the built-in solenoid valves
- Programmable inlet valves for fresh air and inert gas
- Integrated weekly programmer with group function (e.g. all workdays)
- Recessing push/turn control for simple operation of the oven
- Visual alarm indication
- Built-in sounder as alarm if limit values are crossed, as acoustic signal at programme end and to acknowledge input (key click)
- Digital monitor controller for overtemperature, undertemperature and automatic setpoint-following monitor (ASF)
- Mechanical temperature limiter (TB protection class 1)
- Monitor relay to switch off heating in case of fault
- Each thermoshelf has a separate Pt100 DIN class A temperature sensor for temperature measurement and can be removed individually
- Convenient integral 3-point temperature and vacuum calibration
- Temperature-dependent control unit ventilation
- USB interface for computer-based temperature control programmes and to read out the controller's internal log memory
- MEMMERT software "Celsius" for remote operation of the oven via computer and for reading the controller's internal log memory
- A pre-formatted blank MEMoryCard XL with 32 kByte storage capacity, reprogrammable for up to 40 ramp segments and additionally 270 hours log memory with a scanning interval of one minute
- Built-in Peltier cooling unit CDP (cooling shelf fed to the working chamber)

Optionally available additional fittings:

- 24 volt control output for purging and switching off external vacuum pump
- Number of flange sockets (inserts) for thermoshelves: 3 instead of 2 (VO 200) or 4 instead of 2 (VO 400-500)
- Number of thermoshelves: 2 instead of 1 (VO 400-500)
- Connection of inert gas switchover via solenoid valve
- Interface for control of optional pump module
- Drip tray
- USB printer port
- Base
- Pump module
- USB cable
- External card reader for MEMoryCard XL for connection to USB interface
- Printer cable (parallel, shielded) 25-pin.

Descriptions in this manual referring to these optional additional fittings are only relevant for ovens of the corresponding version.

WARNING! Always pull out the supply plug before opening the oven cover!

4.2 Electrical equipment

- Operating voltage see label 50/60 Hz
- Current rating see label
- Protection Class 1, i.e. operating isolation with ground connection to EN 61 010
- Protection IP20 to DIN EN 60 529
- Interference suppression to EN55011 Class B
- Oven protected by a fuse 250V/15A fast blow
- Controller protected by a 100 mA fuse (200 mA on 115 V)
- When connecting a MEMMERT oven to the electrical supply you have to observe any local regulations which apply (e.g. in Germany DIN VDE 0100 with FI protection circuit)

  This product is intended to operate on a supply network with a system impedance Zmax at the transfer point (building connection) of 0.292 Ohm max. The user has to ensure that the product is only operated on an electrical supply network which meets these requirements. If necessary, details of the system impedance can be obtained from the local electricity supply authority.

Note:
Any work involving opening up the oven must only be carried out by a suitably qualified electrician!

4.3 External connection

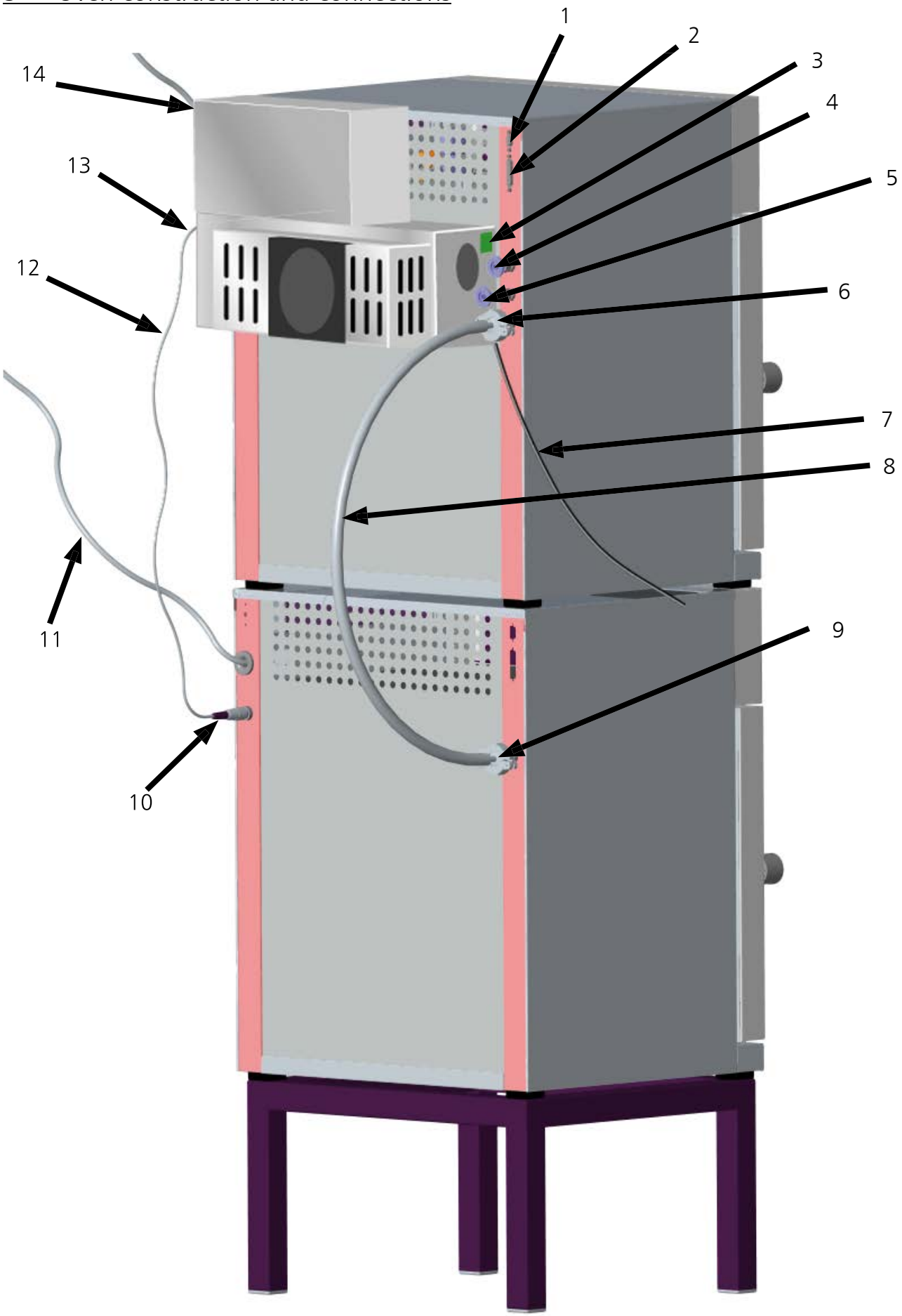
Equipment connected to the external connections must have interfaces which meet the requirements for safe low voltage (e.g. PC, printer).

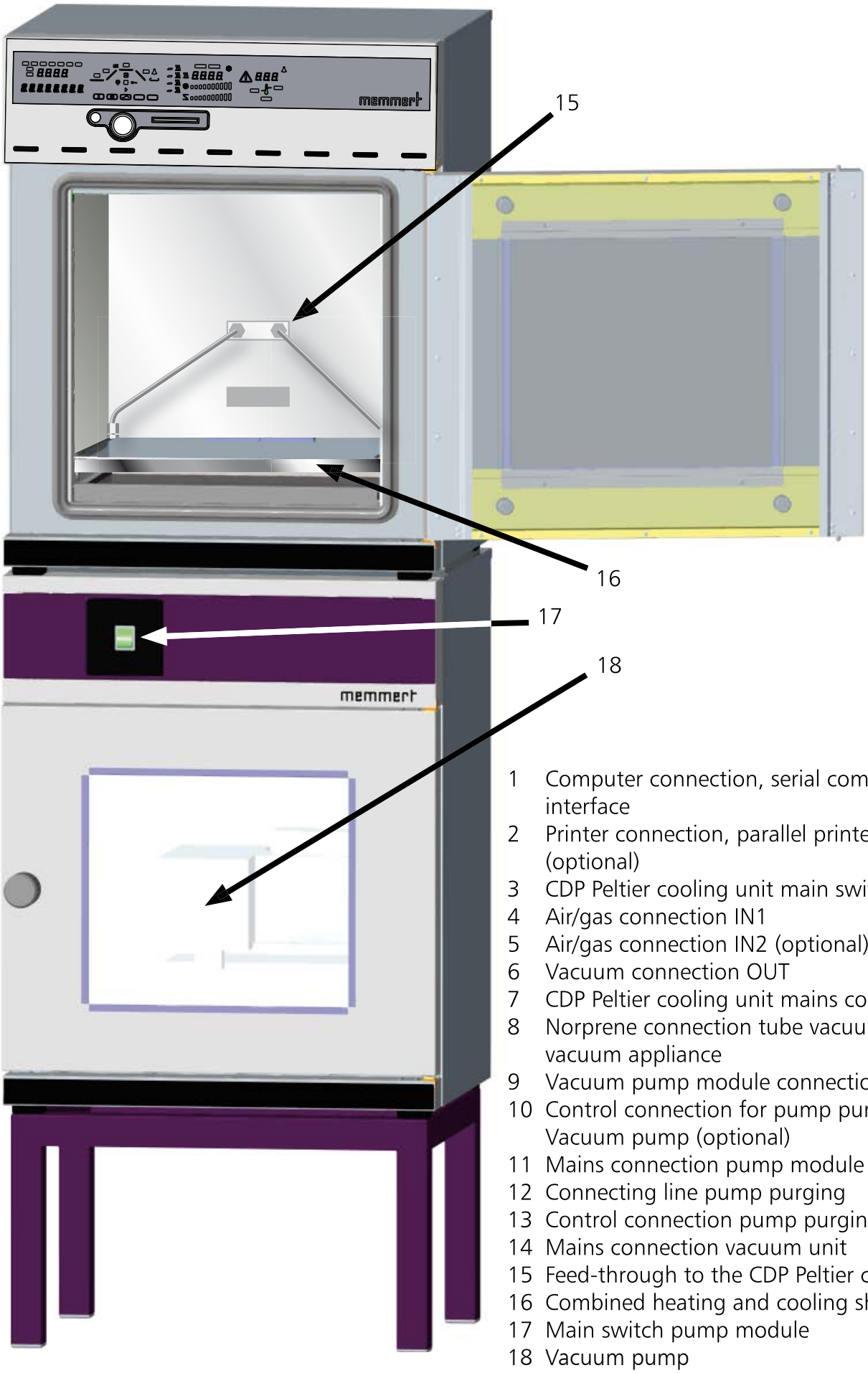
4.4 Material quality from MEMMERT:

- External casing: stainless steel (Mat.Ref. 1.4016)
- Piping: stainless steel (Mat.Ref. 1.4571)
- Working space: stainless steel (Mat.Ref. 1.4404) featuring high stability, optimal hygienic properties, and corrosion resistance against many (not all!) chemical compounds (warning against chlorine compounds, for example).
- Cooling shelf: aluminium.
- Seals in solenoid valves and electrical sockets: fluoride rubber FKM/FPM (Viton)
- Door seal: Silicone rubber

The load for the vacuum drying oven must be carefully evaluated for its chemical compatibility with the above materials.
A table listing about the compatibility of all these materials can be requested from MEMMERT.

5 Oven construction and connections





1 Computer connection, serial communication interface
2 Printer connection, parallel printer port (optional)
3 CDP Peltier cooling unit main switch
4 Air/gas connection IN1
5 Air/gas connection IN2 (optional)
6 Vacuum connection OUT
7 CDP Peltier cooling unit mains connection
8 Norprene connection tube vacuum pump - vacuum appliance
9 Vacuum pump module connection
10 Control connection for pump purging Vacuum pump (optional)
11 Mains connection pump module
12 Connecting line pump purging
13 Control connection pump purging
14 Mains connection vacuum unit
15 Feed-through to the CDP Peltier cooling unit
16 Combined heating and cooling shelf
17 Main switch pump module
18 Vacuum pump

6 Starting up

1. Connect the vacuum connection (6) to the vacuum pump connection (9) of the pump module or to a suitable external vacuum pump, using the Neoprene connection tubing (8) supplied with the pump module.

2. When using a pump module, the connections for the pump purge (10 + 13) must be linked together using the cable (12) supplied with the equipment.

3. Plug in the mains supply plugs of the supply cables (7 + 11 + 14).

4. If the oven is to be charged with inert gas (e.g. nitrogen) the gas cylinder must be connected only to the gas inlet IN2 (4). The maximum pressure of 1.5 bar must not be exceeded! (Use pressure reducing valve for 1.5 bar max.)

5. Close the door of the vacuum oven.

6. Switch on the main switch (17) of the optional pump module.

7. Switch on the main switch of the vacuum oven.

8. If operating temperatures below room temperature are needed:
   Turn on the CDP Peltier cooling unit (3)

Warning
On first start-up do not operate the oven unsupervised until steady conditions have been reached!

7 Switching output for external vacuum pump purge valve and pump control (option)

The 3-way switched output serves to control the vacuum pump of the optional pump module (PM) of the vacuum oven (VO).

Pin connections of the socket on the back of the unit:

1	output purge valve GND (switched)
2	24V DC
3	pump switch-off GND (switched)

7.1 Vacuum pump purge valve

When loads with a high moisture content are being dried there is a possibility during prolonged operation that the pump output decreases through condensate forming in the pump heads. The diaphragms can be blown free by briefly purging the pump heads with fresh air. This improves the effectiveness of the drying process.

Note:

In conjunction with the optionally available pump modules PM 200, PM 400 and PM 500 this cyclic purge takes place automatically as the pump performance deteriorates.

Decisive advantage:

The drying process takes place more rapidly and with reduced energy consumption, the wear on the pump is reduced.

This function can be de-activated by removing the pump purge connecting cable at the back of the unit.

7.2 Demand-controlled vacuum pump shut-down (option)

After the end of a drying programme, or after prolonged operation with any vacuum demanded by the controller, the vacuum pump incorporated in the pump module (PM) is switched off via the control line.

Note:

A control signal switches off the vacuum pump incorporated in the optional pump module (PM). The signal lamp in the main switch of the pump module remains alight even when the vacuum pump has been switched off via the control line.

Decisive advantage:

The demand-controlled shut down of the vacuum pump reduces energy consumption and increases the life of the vacuum pump by reducing the wear on the pump diaphragms.
This function can be de-activated by removing the pump purge connecting cable at the back of the unit. The vacuum pump is then running continuously.

8 Loading and Inertgas

- The load must only be placed on the thermoshelves.
- Do not dry or heat any load which releases fumes developing an inflammable mixture in combination with air.
- Provide optimum heat transfer from the thermoshelf to the load. Ensure that the load rests properly on the tray.

Safety note:

When the oven is being operated with inert gas (nitrogen, helium, neon, argon, krypton) there is a small escape of the gas used into the environment.
The list of MAK values (maximum workplace concentration) and of BAT values (biological workplace tolerance values) does not contain any information concerning the inert gases mentioned above.
It is however still important to ensure good ventilation of the room.
The appropriate specifications of the trade association publication „Guidelines for the Laboratory“ (ZH1/119) as well as DIN 1946 Part 7 „Room Air Technology (VDI Ventilation Rules)“ should be observed.

Precautions when handling gas cylinders:

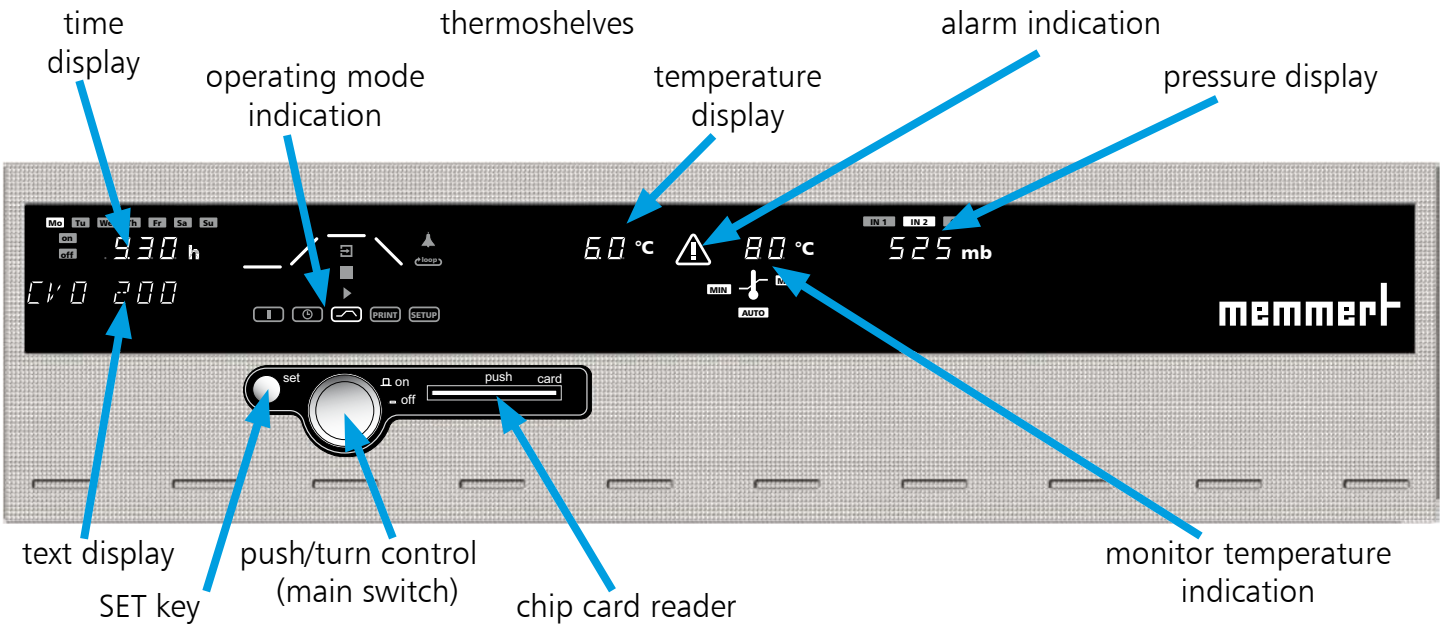
- Avoid any open fire in the area near the gas cylinders. Inert gas is not combustible, but it is possible for the cylinder to burst.
- Store cylinders below 50°C in a well ventilated location. Prevent ingress of water and any return flow into the cylinder.
- Connect up the gas cylinder only through a pressure reducing valve (1.5 bar max.).
- When not in use, close the shut-off valve.
- The instructions and safety information of the gas supplier have to be observed.

9 Guidelines for evaporating liquids in Memmert-vacuum ovens

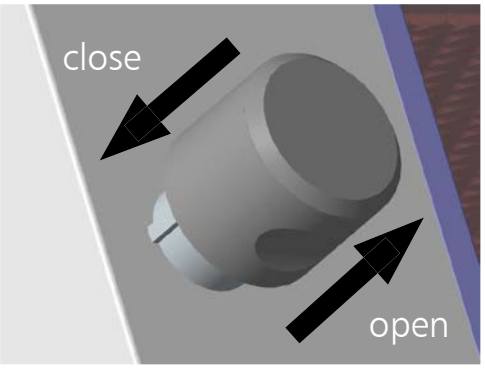
- Do not heat liquids in closed vessels.
- In order to prevent condensation in the working space, heat liquids using a drying programme (with venting cycles).
- In order to prevent excessive condensation in the working space, working temperature and venting cycles should be chosen to suit the moisture content of the load.
- Do not heat any liquids releasing fumes which form an inflammable mixture with air.
- During the evaporation of liquids with a large surface area it is possible that the cooling produced during evaporation may result in the set temperature not being reached.

The oven described in these Operating Instructions must never be used for drying or heating of loads releasing fumes which may form an inflammable mixture in combination with air! The ovens described here must never be operated in areas with a hazardous atmosphere!

10 Controls and indications



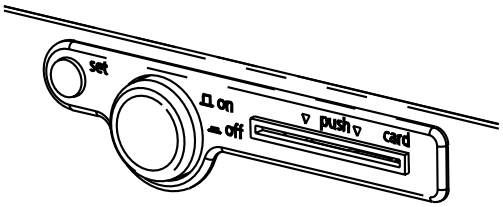
11 Operating the door



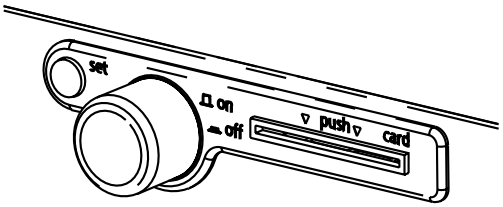
The door is opened by pulling on the door handle.
The door is closed by the door handle being pushed in.

12 Switching on

The oven is switched on by pressing the push/turn control.



Oven switched off. The push/turn control is pushed in and protected against damage.



Oven switched on and can be operated using the push/turn control and the SET key.

13 Setting the temperature

Hold down the SET key and set the temperature setpoint with the push/turn control.
After the SET key has been released the display briefly flashes the temperature setpoint. The display then changes to the actual current temperature and the controller starts to control to the selected temperature setpoint.

14 Quick venting function

The quick venting function is used in unloading and loading the vacuum oven without having to alter the selected vacuum setpoint:

1. Rotate control anticlockwise and select OPENDOOR in the menu.

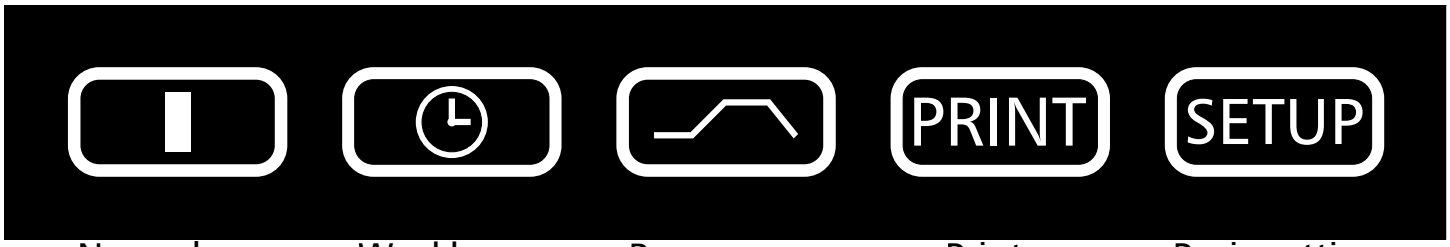
2. For rapid venting of the vacuum oven, press SET key.

3. The vacuum oven is vented automatically to atmosphere so that the door can be opened.

4. To evacuate the vacuum oven to the most recently selected vacuum setpoint, press the SET key again.

15 Status indication for the heating levels

16 Selecting the operating mode



Normal operation	Weekly programmer	Programme operation	Printer	Basic settings

After holding down the SET key (approx. 3 sec), the current operating mode flashes on the display. A different operating mode can be selected with the push/turn control while the SET key is being held down. After the SET key has been released the controller operates in the new operating mode.

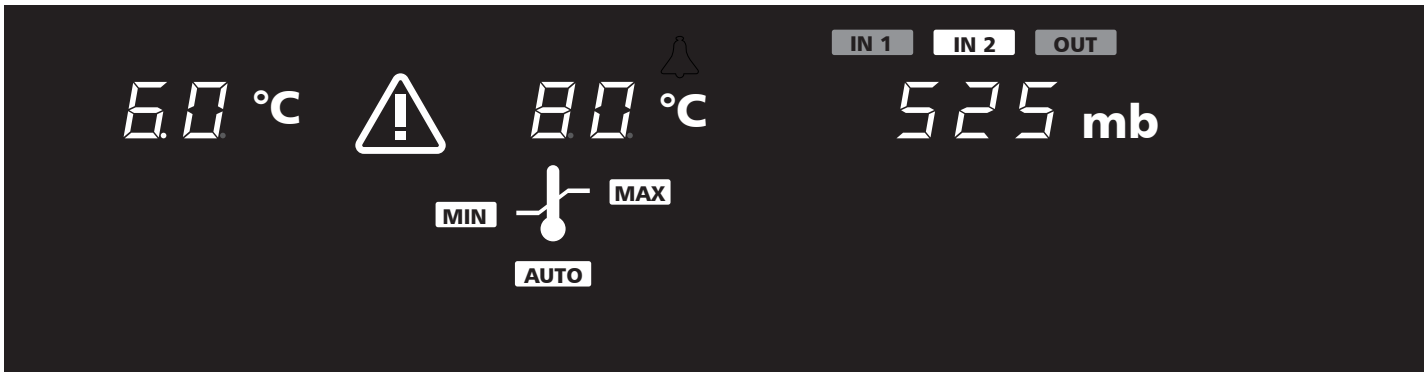
17 Setting the parameters

After an operating mode has been selected, all relevant controller settings are shown simultaneously on the display.
A parameter (menu item) can be selected by rotating the push/turn control; all other parameters are then dimmed.
The selected parameter flashes brightly and can now be altered with the push/turn control while holding down the SET key.
After the SET key has been released the newly set value is stored.

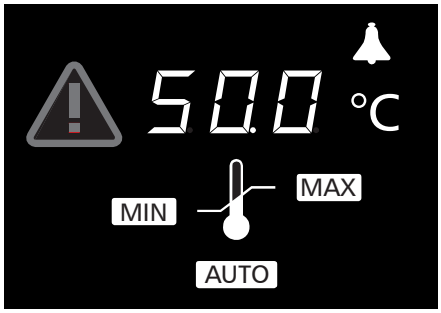
If the push/turn control or the SET key have not been operated for a period of 30 seconds, the controller automatically returns to the main menu.

18 Normal operation

In this operating mode the oven operates continuously. The settings for operating the oven can be selected. The settings act directly on the operation of the oven.

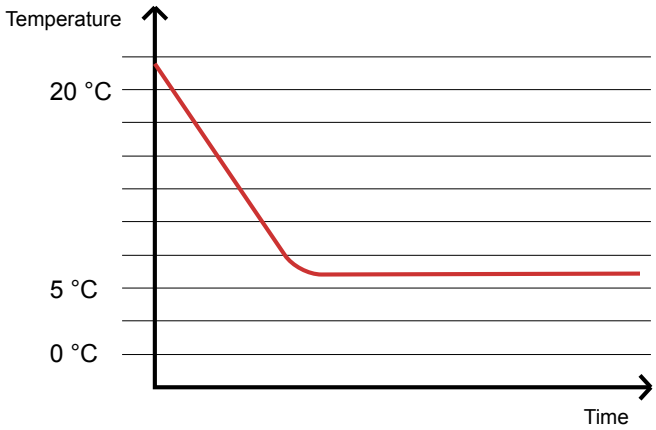


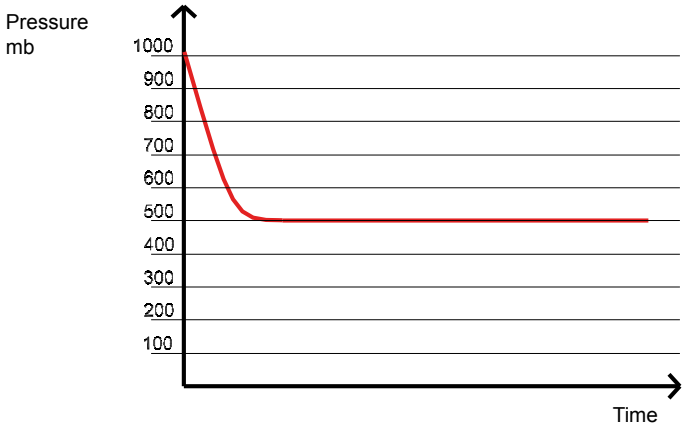
By rotating the push/turn control the following parameters can be selected and can be altered as described in the Section „Setting the parameters“:

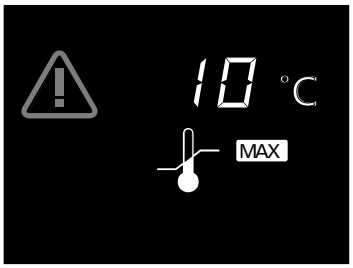
Temperature setpoint Range: 5°C to 90°C Optionally -5°C to 90°C Note: If operating temperatures below room temperature are not required: Turn off the CDP Peltier cooling unit.		
Temperature monitor Adjustment range: MIN MAX AUTO (see Section: “Temperature monitor“)		
Pressure setpoint Range: 5mb to 1100mb LO = valve OUT permanently open		

Setting example “Normal operation“

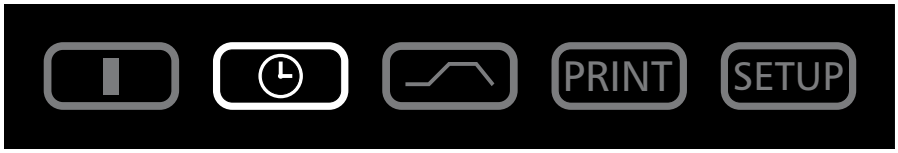
The unit should cool down to 6° C and be evacuated to 500 mb. The monitoring function should respond at 10° C.





1. Select operating mode “Normal operation“ After holding down the SET key (approx. 3 sec), the current operating mode is flashing. Select operating mode I with the push/turn control while holding down the SET key. After the SET key has been released the controller is in operating mode I.	
2. Select temperature setpoint Hold down the SET key and use the push/turn control to select the required temperature setpoint of 6°C. After the SET key has been released the oven briefly flashes the temperature setpoint. The display then changes to the actual temperatureand the controller starts to control to the selected temperature setpoint 6°C. Heating is indicated by the orange heater symbol.	
5. Select monitor temperature Turn the push/turn control clockwise until the overtemperature display MAX is flashing. Hold down the SET key and use the push/turn control to set the monitor temperature to 10°C.	
4. Setting the vacuum Rotate push/turn control clockwise until the vacuum indication is flashing. Hold down the SET key and use the push/turn control to set the required vacuum of 500mb. After releasing the SET key the oven briefly flashes the vacuum setpoint. The display then shows the actual pressure and the control starts to control to the selected vacuum of 50mb.	

19 Weekly programmer



In this operating mode the weekly programmer is activated and the oven switches on and off automatically at the programmed times.
While the weekly programmer is in the OFF phase the oven is in standby mode. Heating and fan are switched off, the controller display is dimmed and shows the clock time.
The sequence of the weekly programmer is repeated every week.
A maximum of 9 time blocks, each consisting of ON time and OFF time, can be programmed.

By rotating the push/turn control the following parameters can be selected and can be altered as described in the Section "Setting the parameters":

Weekday Range: Monday to Sunday	Mo Tu We Th Fr Sa Su
Day groups Range: workday Mo-Fr weekend Sa-Su	Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su
No ON time: ---- On these days the oven is not switched on	on - - - -
ON time Range: 00:00 to 23:59 hrs.	on 07.30 h
OFF time Range: one minute above ON time to 24:00	off 18.00 h

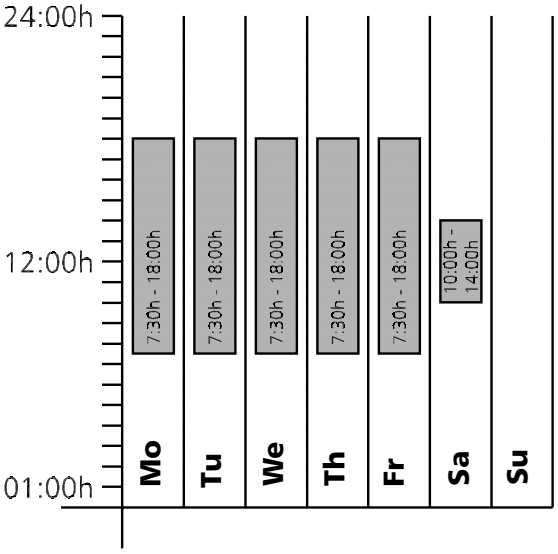
Further clockwise rotation selects the parameters (temperature setpoint etc.) as in operating mode I.
If no further settings (temperature setpoint etc.) are made for the ON phase, the controller accepts the values from operating mode I.
For safety reasons, always check that an ON time has been programmed only during the required time blocks and days.

Direct setting of the temperature setpoint:

When the controller is in stand-by mode or if the weekly programmer is in the ON phase, the temperature setpoint can be selected directly by briefly pressing the SET key. Clockwise rotation then selects the temperature monitor. Anticlockwise rotation again selects setting the individual time blocks.

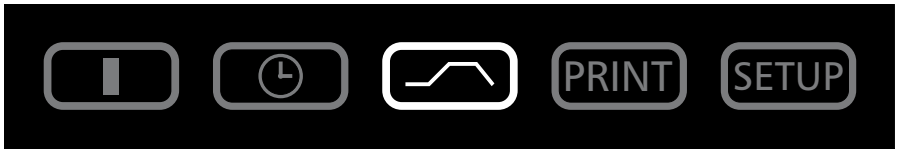
Programming example “Weekly programmer“

The oven (VO500) has to switch on at 07.30 hrs from Mo to Fr (workday group) and switch off at 18.00 hrs. In addition it has to operate on Saturday from 10.00 to 14.00 hrs.



1. Select operating mode “Weekly programmer“ After holding down the SET key (approx. 3 sec) the current operating mode is flashing. Select operating mode “Weekly programmer“ with the push/turn control while holding down the SET key. After the SET key has been released the controller is in operating mode “Weekly programmer“.	PRINT SETUP
2. Switch on at 07.30 hrs Mo-Fr Turn the push/turn control anticlockwise to select the symbols “Mo-Fr on“ (workday group). Hold down the SET key and use the push/turn control to set the switch-on time to 7:30.	Mo Tu We Th Fr on 07.30 h MO-FR
3. Switch off at 18.00 hrs Mo-Fr Using the push/turn control select the symbols “Mo-Fr off“ (workday group). Hold down the SET key and use the push/turn control to set the switch-off time to 18:00.	Mo Tu We Th Fr off 18.00 h MO-FR
4. Switch on at 10.00 hrs Sa Using the push/turn control select the symbols “Sa on“. Hold down the SET key and use the push/turn control to set the switch-on time to 10:00.	Sa on 10.00 h SAT ON
5. Switch off at 14.00 hrs Sa Using the push/turn control select the symbols “Sa off“. Hold down the SET key and use the push/turn control to set the switch-off time to 14:00.	Sa off 14.00 h SAT OFF

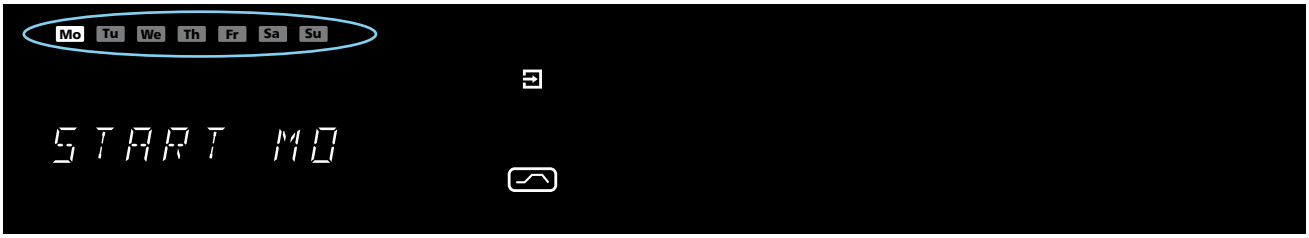
20 Programme operation



In this operating mode, up to 40 freely programmable temperature-time ramps can be set. Rotating the press/turn control while holding down the SET key selects the following parameters in sequence after released the SET key:

- a new programme can be programmed or an existing programme can be edited	EDIT
- stops the programme	STOP
- starts the programme	START

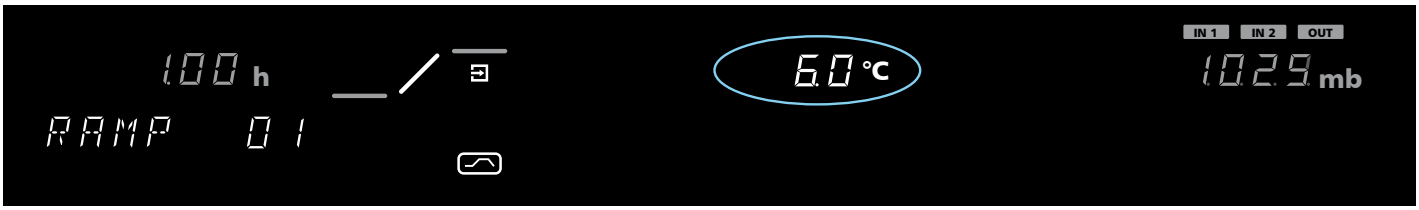
After EDIT has been activated, the following parameters can be selected and can be altered as described in the Section "Selecting the parameters":



Delayed programme start: switch-on day
Range: Monday to Sunday, workdays Mo-Fr, weekend Sa-Sun, all days Mo-Su or no day. If no day of the week is selected, the oven starts up immediately after the programme is started. (INSTANT START)

Delayed programme start: switch-on time
Range: 00:00 to 23:59
If no switch-on day has been selected it is not possible to select a switch-on time, and the programme starts immediately. (INSTANT START)

Duration of first ramp segment
Range: 1 minute to 999 hours



Setpoint temperature / temperature at the end of the ramp segment
Range: 5°C to 90°C, optionally -5°C to 90°C

Vacuum at the end of the ramp segment
Adjustment range: 10 to 1100 mbar or LO

Closure command of ramp segment
Range: NEXT, SPWT, LOOP, HOLD, END (see Section: „Closure commands for ramp segments“)

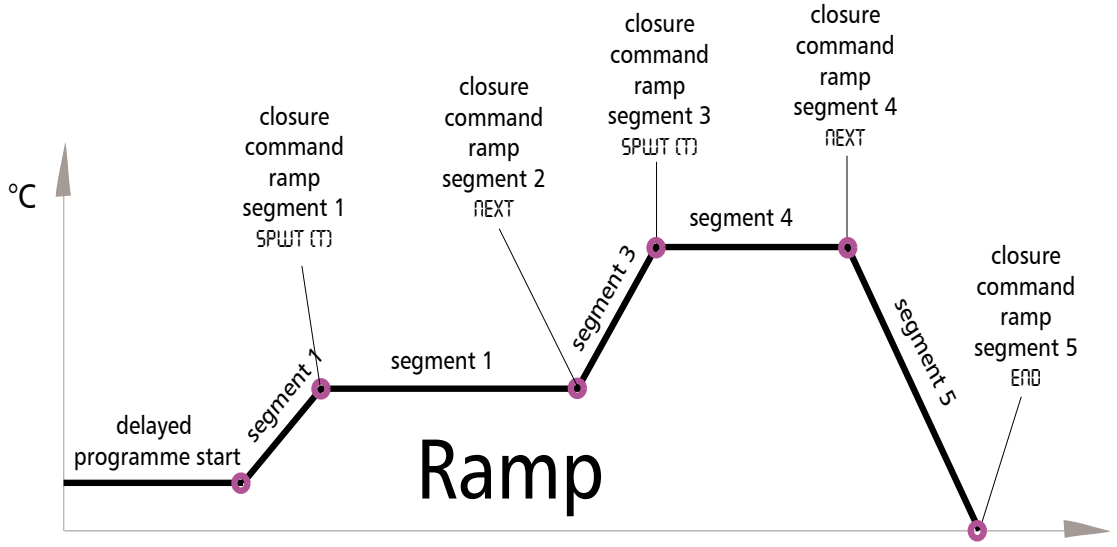
Exit the programme write mode EDIT
Turn the push/turn control clockwise unti EXIT appears on the display, briefly press the SET key to enter

Note: If operating temperatures below room temperature are not required: Turn off the CDP Peltier cooling unit.

20.1 Closure commands for ramp segments

NEXT NEXT	Follow-on with next programme segment.
SPWT (T) SPWT (T) SET-POINT WAIT	Wait until the setpoint temperature is reached. The oven only starts the next programme segment when the programmed setpoint temperature has been reached, even if the programmed heating time has already elapsed.
SPWT (P) SPWT (P) SET-POINT WAIT	Wait until the set vacuum has been reached. The oven starts the next programme segment only when the programmed vacuum has been reached, even if the programmed segment time has already elapsed or if the set temperature has already been reached.
SPWT (PT) SPWT (PT) SET-POINT WAIT	Wait until temperature setpoint and vacuum setpoint have been reached. The oven starts the next programme segment only when the programmed setpoint temperature <u>and</u> the programmed vacuum have been reached, even if the programmed segment time has already elapsed.
LOOP LOOP	Ramp repeat function. The set programme is repeated after passing through all programmed segments. 1-99 = repeats CONT = continuous repeat function
HOLD FIRST	End of programme without switching off the heating; temperature and all other settings (e.g. air valve) are maintained.
END END	Programme end, heating is switched off, chamber is vented.

The programme segments are linked together by the segment closure command. These commands therefore control the programme sequence.



Setting-up example “Programme operation”

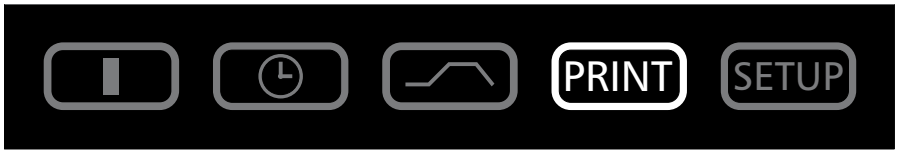
The oven has to heat up on Monday at 8.00 hrs, and after reaching the temperature be evacuated to 50 mbar. After holding pressure and temperature for 2 hours, the pressure should increase to 1050 mbar over two hours and the oven should over the same period cool down to 30°C.

1. Select operating mode “programme“ After holding down the SET key (approx. 3 sec) the current operating mode is flashing. Hold down the SET key and select operating mode “programme“ using the push/turn control. After the SET key has been released the controller is in operating mode “programme operation“.	PRINT SETUP
2. Edit programme Hold down the SET key and turn the push/turn control to select ”EDIT”. After the SET key has been released, the controller is in the programme writing mode.	
3. Weekday for delayed programme start Hold down the SET key and turn the push/turn control to set the start day Mo.	Mo START MO
4. Select clock time for delayed programme start Using the push/turn control, select the time display. Hold down the SET key and set the time 08:00 using the push/turn control.	8.00 h SET TIME
5. Select duration of first ramp segment Turn the push/turn control further clockwise until the time of the first ramp segment is flashing. Hold down the SET key and set the time 00:01 using the push/turn control.	0.01 h RAMP 01
6. Select temperature of first ramp segment Turn the push/turn control clockwise until the temperature display is flashing. Hold down the SET key and set the required temperature setpoint of 80°C using the push/turn control.	80.0 °C RAMP 01
7. Setting the vacuum of first ramp segment Rotate push/turn control clockwise until the vacuum indication is flashing. Hold down the SET key and use the push/turn control to set the required vacuum of 1050mb.	1050 mB RAMP 01

8. Setting the air/gas connection IN1 of the first ramp segment (only with corresponding additional fittings) Turn the push/turn control to the right until the INLET display flashes. Hold down the SET key and select the desired air/gas connection IN1 with the push/turn control.	in. 1 INLET
9. Set closure command of first ramp segment Turn the push/turn control clockwise until a segment closure command (e.g. END) appears. Hold down the SET key and set SPWT (T) with the push/turn control.	SPWT (T)
10. Select duration of second ramp segment Using the push/turn control select the time indication. Hold down the SET key and set the time 00:01 using the push/turn control.	0.01 h RAMP 02
11. Select temperature of second ramp segment Turn the push/turn control clockwise until the temperature display is flashing. Hold down the SET key and set the required temperature setpoint of 80°C using the push/turn control.	80.0 °C RAMP 02
12. Setting the vacuum of second ramp segment Rotate push/turn control clockwise until the vacuum indication is flashing. Hold down the SET key and use the push/turn control to set the required vacuum of 50mb.	50. mB RAMP 02
13. Setting the air/gas connection IN1 of the second ramp segment (only with corresponding additional fittings) Turn the push/turn control to the right until the INLET display flashes. Hold down the SET key and select the desired air/gas connection IN1 with the push/turn control.	in. 1 INLET
14. Set closure command for second ramp segment Turn the push/turn control clockwise until a segment closure command (e.g END) appears. Hold down the SET key and set SPWT (P) with the push/turn control.	SPWT (P)
15. Select duration of third ramp segment Using the push/turn control select the time indication Hold down the SET key and set the time 02:00 using the push/turn control.	02.00 h RAMP 03
16. Select temperature of third ramp segment Turn the push/turn control clockwise until the temperature display is flashing. Hold down the SET key and set the required temperature setpoint of 80°C using the push/turn control.	80.0 °C RAMP 03
17. Setting the vacuum of third ramp segment Rotate push/turn control clockwise until the vacuum indication is flashing. Hold down the SET key and use the push/turn control to set the required vacuum of 50mb.	50. mB RAMP 03

18. Setting the air/gas connection IN1 of the third ramp segment (only with corresponding additional fittings) Turn the push/turn control to the right until the INLET display flashes. Hold down the SET key and select the desired air/gas connection IN1 with the push/turn control.	in. 1 INLET
19. Set closure command for third ramp segment Turn the push/turn control clockwise until a segment closure command (e.g END) appears. Hold down the SET key and set NEXT with the push/turn control.	NEXT
20. Select duration of fourth ramp segment Using the push/turn control select the time indication Hold down the SET key and set the time 02:00 using the push/turn control.	02.00 h RAMP 04
21. Select temperature of fourth ramp segment Turn the push/turn control clockwise until the temperature display is flashing. Hold down the SET key and set the required temperature setpoint of 30°C using the push/turn control.	30.0 °C RAMP 04
22. Setting the vacuum of fourth ramp segment Rotate push/turn control clockwise until the vacuum indication is flashing. Hold down the SET key and use the push/turn control to set the required vacuum of 1050mb.	1050 mB RAMP 04
23. Setting the air/gas connection IN1 of the fourth ramp segment (only with corresponding additional fittings) Turn the push/turn control to the right until the INLET display flashes. Hold down the SET key and select the desired air/gas connection IN1 with the push/turn control.	in. 1 INLET
24. Set closure command for fourth ramp segment Turn the push/turn control clockwise until a segment closure command (e.g END) appears. Hold down the SET key and set END with the push/turn control.	END
25. Exit programme writing mode EDIT Turn the push/turn control clockwise until EXIT appears on the display. Press the SET key briefly to enter.	EXIT
26. Set temperature monitor Turn the push/turn control clockwise and set the temperature monitor. (see Section: "Temperature monitor")	200 °C MAX
27. Start programme Turn the push/turn control anticlockwise until the stop symbol ■ is flashing. Hold down the SET key and select Start ▶ with the push/turn control.	▶

21 Printer PRINT



VO ovens may be equipped with a parallel printer interface, as used in personal computers.

This parallel printer interface on the back of the oven is suitable for connecting conventional PCL3-compatible ink jet and laser printers which are provided with a parallel printer interface (e.g. HP Deskjet 5550 or HP Deskjet 9xx).

It is important to use a screened interface cable. The screen must be connected to the plug case.

The controller is provided with an internal log memory (see Section: „Log memory"). The report data can in this operating mode be printed out through the printer connected to the oven.

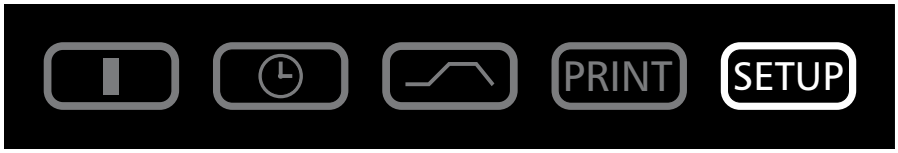
When using a colour printer, the various graphics can be printed in colour.

On the printout the GLP data head is also printed automatically and contains the following information:
- Printing date
- Time period of report
- Running page number
- Serial number and oven designation

By turning the push/turn control the following parameters can be selected in turn and altered as described in the Section Setting the parameters.

Reading the date of the first print page	FIRST
Reading the date of the last print page	LAST
Start graphics print	GRAPH
Print programme and configuration page	LIST
Exit print menu and back to main menu	EXIT

22 Basic oven settings SETUP



In this operating mode it is possible to make the basic settings of the oven. Clock time, date, day, year, and settings of sounder, of address assignment, monitoring units, heater power and calibration are set here.

The following parameters can be selected by turning the push/turn control, and altered as described in the Section „Setting the parameters“:

Clock time in 24-hour format The winter/summer time changeover does not take place automatically but must be set manually by the user.	10.56 h SET TIME
Date The controller incorporates a calendar which automatically allows for the different lengths of the months and also for leap years.	28.06. SET DATE
Weekday	Mo SET DAY
Year Range: from 2000 to 2100	2008 SET YEAR
Audible signal at programme end Setting: OFF or ON	OFF On ENDSOUND
Audible signal on alarm, e.g. overtemperature ALARM SOUND Setting: OFF or ON	OFF On ALARM SO
Communication address Range: 0 to 15 (see Section: „Communication interface“)	ADDRESS
Tolerance margin ASF Range: 2 to 20 °C (see Section: „Temperature monitor“)	ASF SET

Language Settings: GERMAN, ENGLISH, FRANCAIS, ESPANOL and ITALIANO	ENGLISH
Vent connection select IN1 or IN2 (option) Settings: IN1 or IN2 e.g. IN1 for fresh air and IN2 for inert gas	IN. 1 INLET
Calibration correction for user-calibration of temperature. CAL1 to CAL3 ADJUST - TEMPERATURE CALIBRATION READJUST - TEMPERATURE CORRECTION (see Section: „Calibration“)	CAL. 1
Calibration correction for user-calibration of vacuum. CAL1 to CAL3 ADJUST - VACUUM CALIBRATION READJUST - VACUUM CORRECTION (see Section „Calibration“)	CAL. 1
Exit setup mode = store all settings and exit SETUP mode.	EXIT

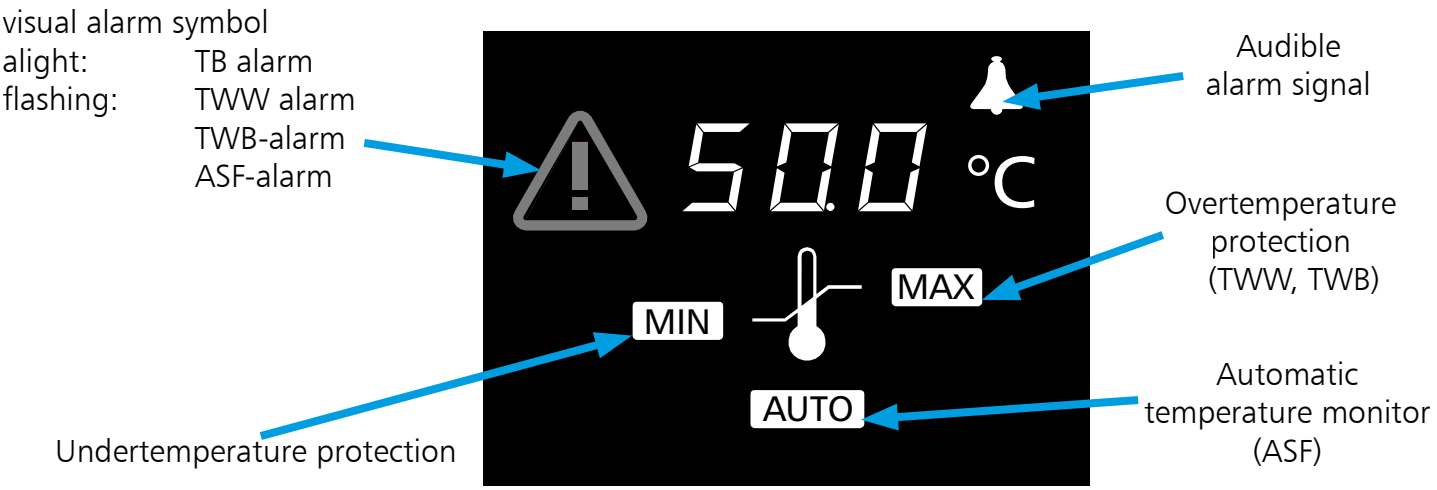
22.1 Real-time clock

The real-time clock is set in SETUP and includes date and clock time.
The real-time clock serves for documentation according to GLP.
Date and clock time are marked in the report print.
On the graphics print the time axis is marked in real-time.
The clock runs with a buffer battery independently of the mains power supply.
The built-in lithium battery Type CR 2032 has a life of approx. 10 years.

23 Temperature monitor and protection devices

The monitoring temperature is measured in the combined heating and cooling sheet by a PT100 temperature sensor.

The oven is provided with duplicate overtemperature protection (mechanical / electronic) according to DIN 12 880.

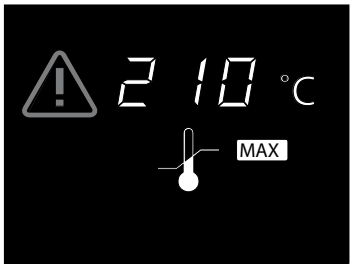
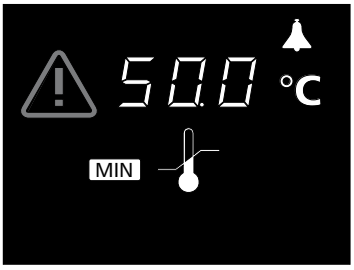


23.1 Mechanical temperature monitor: temperature limiter (TB)

All ovens of the VO series are equipped with a mechanical temperature limiter (TB) Protection Class1 to DIN 12 880.
If the electronic monitor system should fail during operation and the fixed factory-set maximum temperature is exceeded by approx. 20°C the temperature limiter switches off the heating permanently as a final protective measure. The alarm symbol lights up as warning ⚠

Fault rectification after the TB cut-out has been activated:
1. Switch off the oven and allow it to cool down
2. Rectify the fault (e.g. replace temperature probe) and where appropriate contact customer service
3. The oven is again ready for operation only after it has cooled down and after the fault has been rectified

23.2 Electronic temperature monitor

23.2.1 Overtemperature protection MAX Range: up to 10°C max above nominal temperature (for nominal temperature see label)		Using the push/turn control select the symbol MAX -Symbol anwählen. Hold down the SET key and set the protection temperature using the push/turn control.
23.2.2 Undertemperature protection MIN Range: from 10°C below minimum temperature of oven to 10°C above nominal temperature of oven (for nominal temperature see label). The low alarm cannot be programmed above the value set as high alarm. Where no undertemperature protection is required, this has to be set to the lowest temperature.		Using the push/turn control select the symbol MIN. Hold down the SET key and set the protection temperature using the push/turn control.

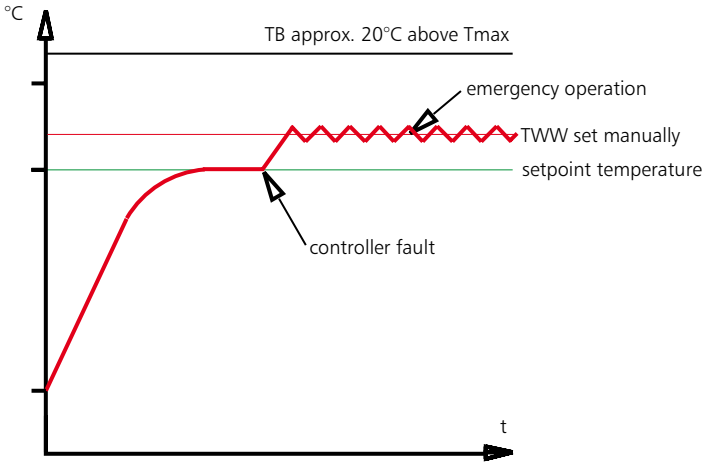
Note:

The temperature monitor can be set independently of the operating mode.
During ramp operation the monitor temperature must always be set sufficiently far above the maximum working temperature.

The manually set monitor temperature and the electronic overtemperature protection are monitored on VO-ovens by an adjustable temperature monitor (TWW) Protection Class 3.1 to DIN 12 880:

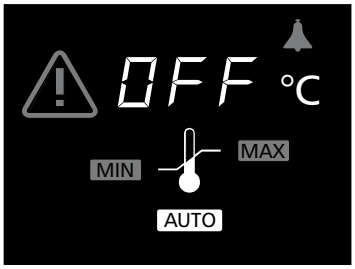
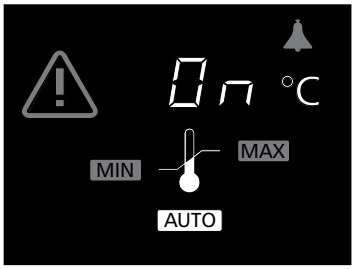
23.2.3 Adjustable temperature monitor (TWW) Protection Class 3.1 to DIN 12 880

If the manually set monitor temperatur MAX is exceeded, the TWW takes over the control of the temperature and starts to control at the monitor temperature. As a warning the alarm symbol ⚠ is flashing.



23.2.4 Automatic temperature monitor (ASF) AUTO

A monitoring device which automatically follows the selected temperature setpoint.
The tolerance margin of the ASF is set in SETUP (see the menu item Tolerance margin ASF in the Section „Basic oven settings SETUP“).

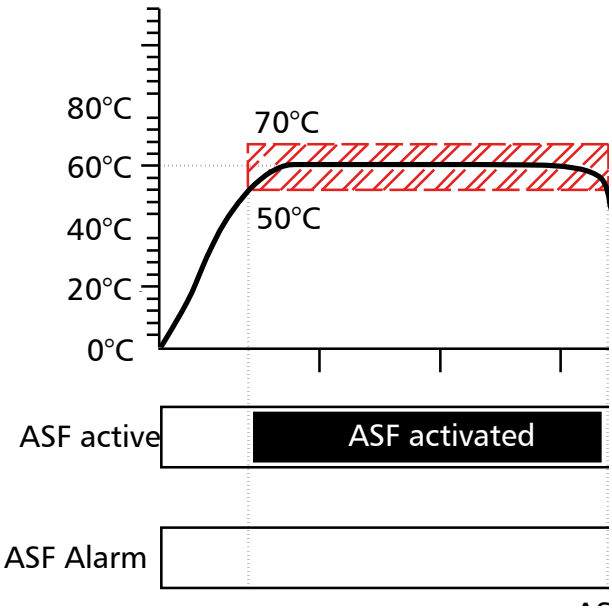
Automatic temperature monitor OFF (ASF OFF)		Using the push/turn control select the AUTO symbol. Hold down the SET key and select OFF using the push/turn control.
Automatic temperature monitor ON (ASF ON)		Using the push/turn control select the AUTO symbol. Hold down the SET key and select ON using the push/turn control.

Notes on the ASF:

The tolerance margin for the ASF is selected in SETUP (see the menu item Tolerance margin ASF in the Section „Basic oven settings SETUP“).

Tolerance margin reached = ASF activated

The ASF is automatically activated when the actual temperature has reached 50% of the selected tolerance margin of the setpoint (in the example 60°C – 5°C).
The activation of the automatic temperature monitor is indicated by the bright AUTO-symbol.

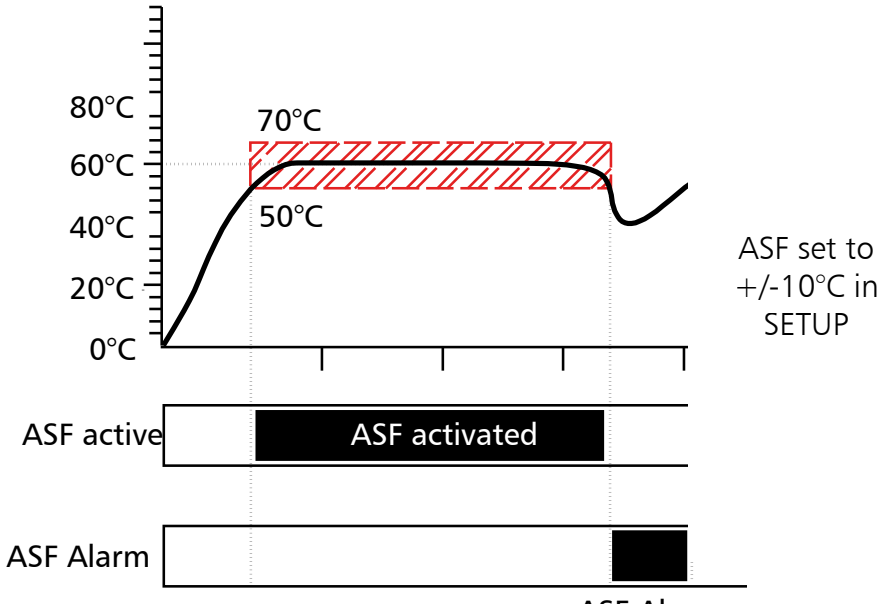


ASF set to +/-10°C in SETUP

Going outside tolerance margin = ASF alarm

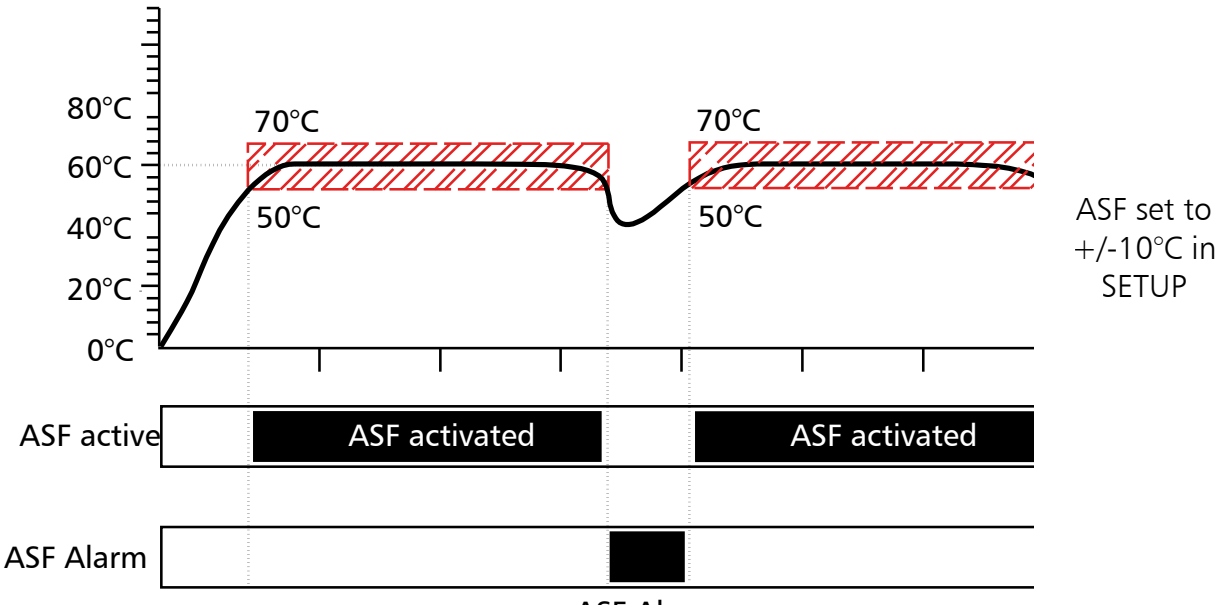
Going outside the selected tolerance margin of the setpoint (in the example 60°C +/-10°C), for example through opening the oven door during operation, triggers the alarm.
Triggering the ASF alarm is indicated by flashing AUTO and ⚠ -symbol.

If the sounder is switched on in SETUP, the ASF alarm is additionally signalled by an interrupted tone. By pressing the SET key the sounder can be switched off temporarily until the next occurrence of an alarm event.



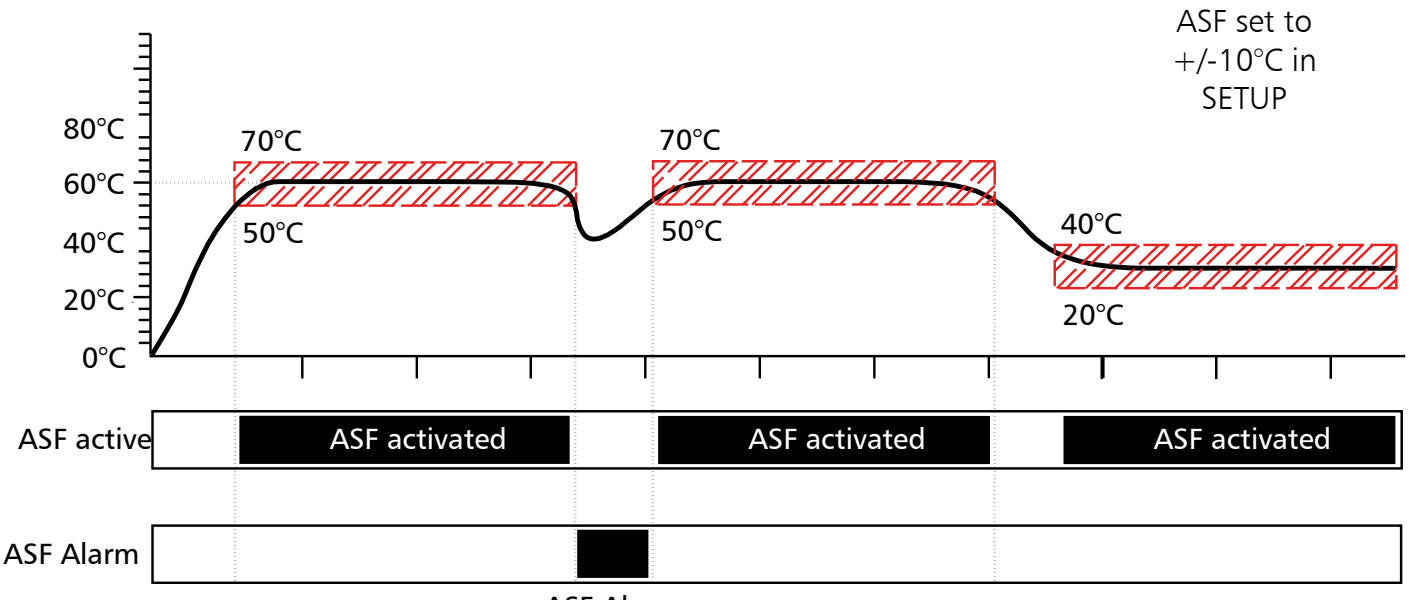
Again within tolerance margin = ASF alarm switched off

The automatic temperature monitor alarm is switched off automatically as soon as the selected tolerance margin of the setpoint (in the example 60°C +/-10°C) is reached again.



Setpoint changed = ASF de-activated automatically

If the temperature setpoint is altered, the automatic temperature monitor is automatically de-activated temporarily (see in the example the setpoint is changed from 60°C to 30°C) until the tolerance margin of the new temperature setpoint is reached (see in the example below: the ASF is re-activated at 30°C +/-10°C).



24 Calibration

24.1 Calibration-temperature

User-calibration of oven and controller, with three calibration temperatures selected by the user.

CAL1 temperature calibration at low temperature
CAL2 temperature calibration at medium temperature
CAL3 temperature calibration at high temperature

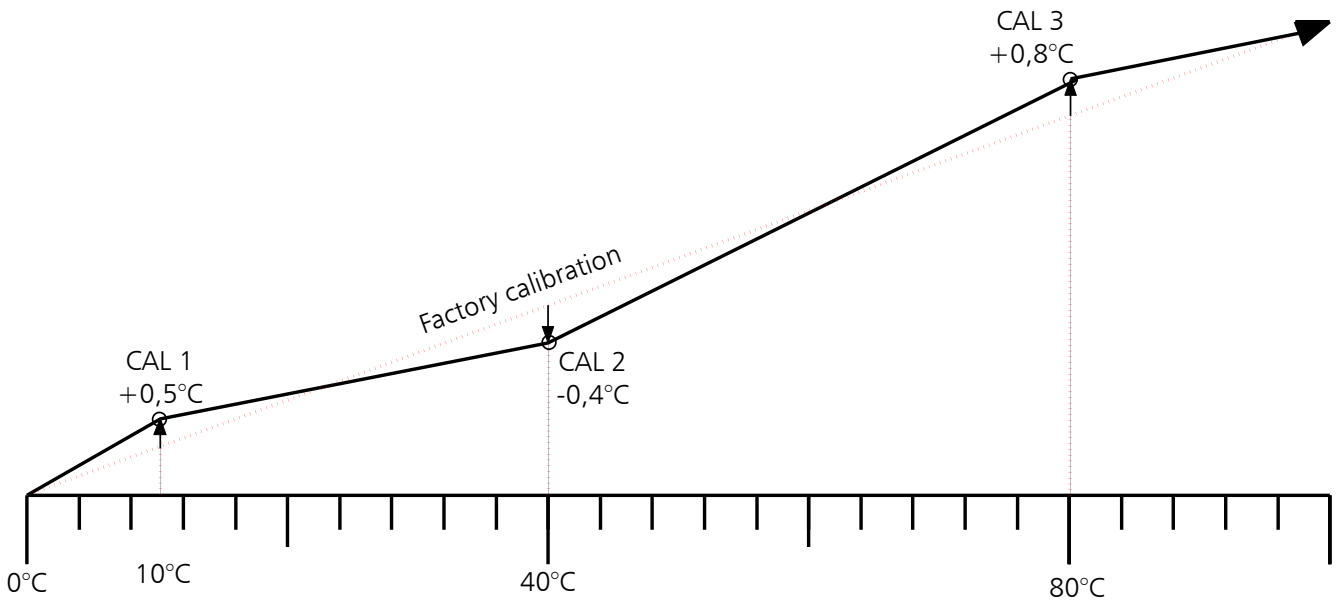
Either a positive or a negative calibration correction can be applied to each selected calibration point.

General calibration instructions:

1. Select the required calibration temperature in SETUP and set the corresponding calibration correction to 0.0°C.
2. Measure the deviation from the selected calibration temperature under steady conditions, using a reference instrument.
3. Set the calibration correction in SETUP. If the measured reference temperature is too low, the calibration correction setting has to have a negative sign.
4. Carry out a check measurement using the reference meter.
5. The procedure can be carried out for up to 3 calibration temperatures.

Example: Correction of a temperature deviation in the load at 40°C.

1. Set calibration temperature CAL.2 to 40.0°C in SETUP and set the corresponding calibration correction to 0.0°C.
2. Using a calibrated reference instrument, an actual temperature of 39.6°C is measured in normal operation for a setpoint temperature of 40°C.
3. In SETUP set the calibration correction for CAL.2 to –0.4°C.
4. After the oven has settled down the reference instrument should read 40.0°C.
5. With CAL.1 a further calibration temperature can be programmed below CAL.2 , and with CAL.3 an additional calibration temperature above CAL.2.



Note:
If all calibration corrections are set to 0.0°C the factory calibration is restored.

Calibration point 1

Calibration temperature
Range down to 10°C below CAL2

Calibration correction
Range –9.9°C to +9.9°C

Calibration point 2

Calibration temperature
Range 10°C above CAL1 to 10°C below CAL3

Calibration correction
Range –9.9°C to +9.9°C

Calibration point 3

Calibration temperature Range
10°C above CAL2 up to nominal temperature

Calibration correction
Range –9.9°C to +9.9°C

24.2 Calibration-pressure (vacuum)

User-calibration of the oven on the controller at three user-selected vacuum values:

CAL1 pressure calibration at low vacuum pressure
CAL2 pressure calibration at medium vacuum pressure
CAL3 pressure calibration at high vacuum pressure

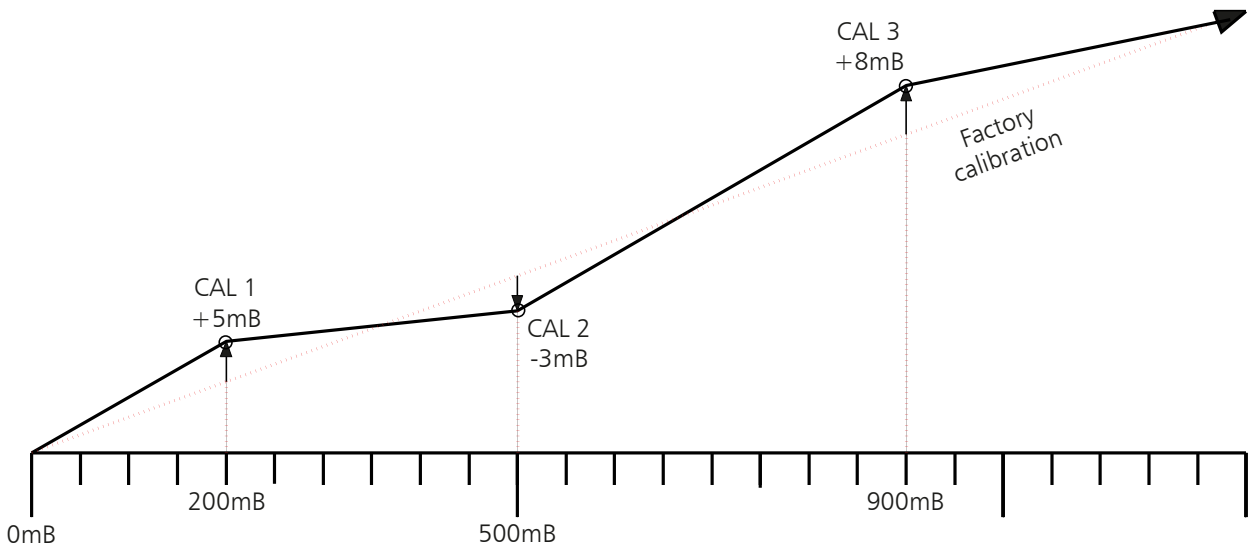
A positive or a negative calibration correction can be applied to each selected calibration point.

General calibration instructions:

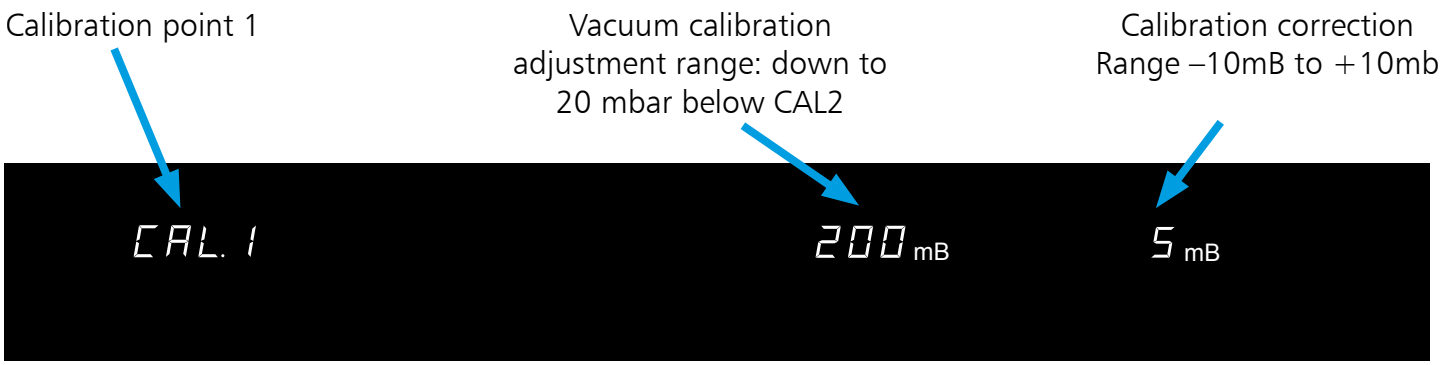
1. Select the required calibration vacuum in SETUP and set the corresponding calibration correction to 0mb.
2. Using a standard vacuum gauge, measure the deviation at the selected calibration vacuum under steady conditions.
3. Set the calibration correction in SETUP. If the measured vacuum pressure is too low, the calibration correction has to be set with a negative sign.
4. Carry out a check measurement with the reference gauge.
5. The procedure can be performed for up to 3 calibration vacuum pressures.

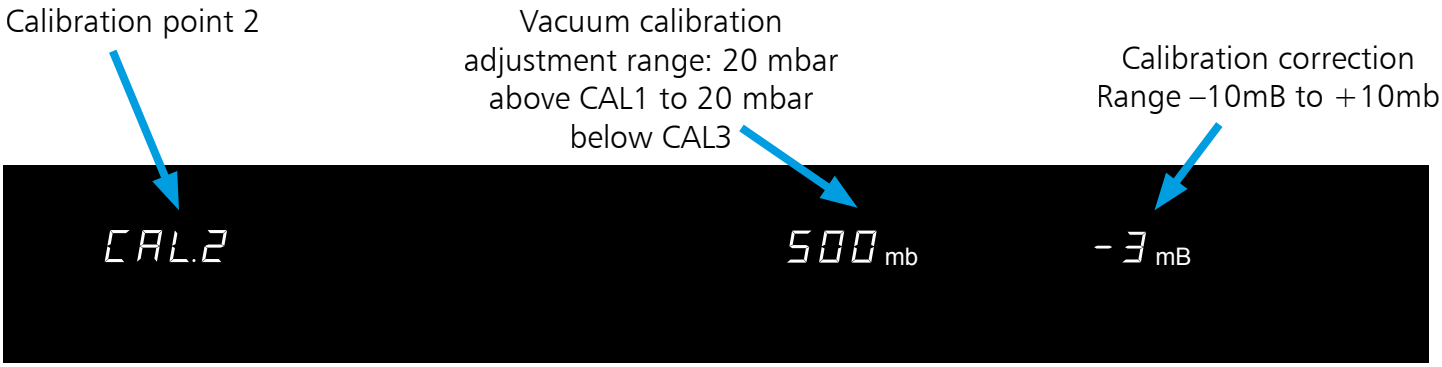
Example: to correct the vacuum deviation in the load at 500 mbar.

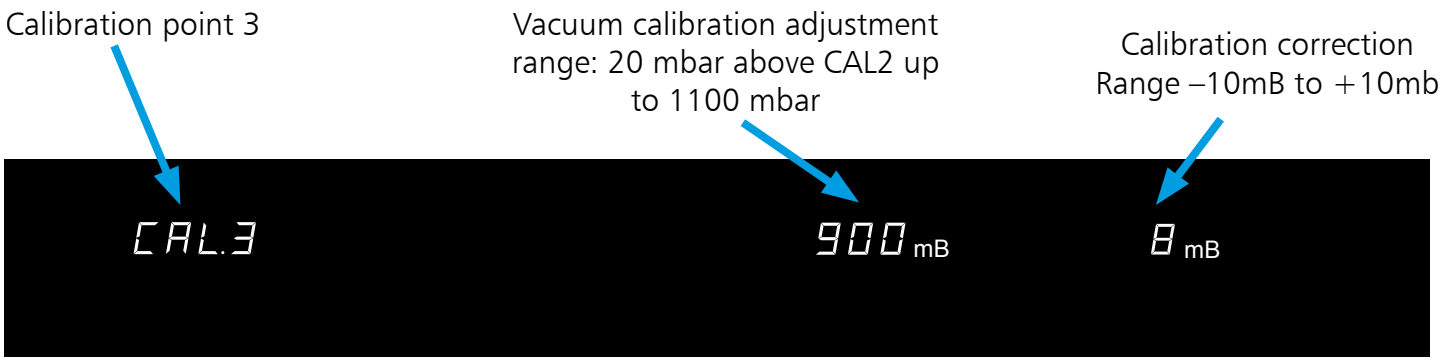
1. Set calibration vacuum CAL2 in SETUP to 500mb and set the corresponding calibration correction to 0mb.
2. In normal operation and at the vacuum setting of 500 mbar, an actual vacuum pressure of 497 mbar is measured using a reference gauge.
3. Set calibration correction CAL2 in SETUP to -3mb.
4. After the oven has stabilised, the reference gauge should indicated 500 mbar.
5. A further vacuum calibration below CAL2 can be programmed with CAL1, and another one above CAL2 with CAL3.



Note:
When all the calibration corrections are set to 0mb, the oven is restored to the factory calibration







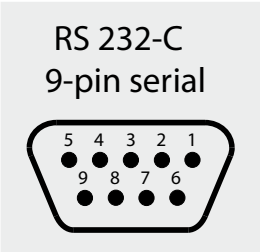
25 Communication interface for the PC

25.1 USB interface

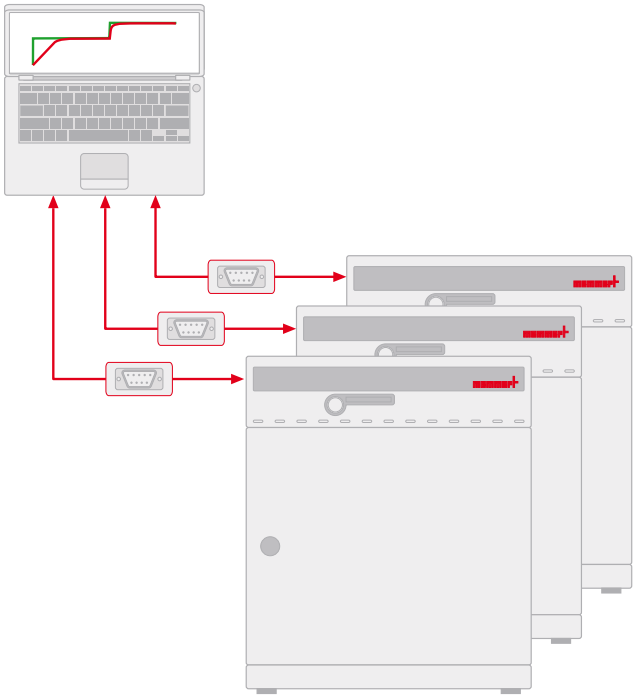
The chamber is fitted by default with a USB interface in accordance with the USB specification. With this interface it is possible to control and log the chamber remotely from the computer. For this, the "Celsius" software is used.
The chamber must be given a unique device address in the SETUP submenu, menu item ADDRESS, via which the computer communicates with the oven. The default setting is ADDRESS 0. Using this, the appropriate oven can be selected and programmed from the computer.
If several chambers are to be connected to a computer via USB interface, an appropriate interface on the computer and a separate cable are required for each chamber.
The maximum cable length is 5 m.

25.2 Communication interface RS232C (option)

The oven is provided as standard with a serial communication interface RS232C according to DIN 12 9001. Using this interface it is possible to control the oven from the PC and to produce reports. This is done using the "Celsius 2007" software.
For this purpose the oven has to be assigned a unique device address in sub-menu SETUP, option ADDRESS; This is the address through which the PC communicates with the oven. The default setting is ADDRESS 0.
Using this address each oven can be addressed by the PC and programmed.
If several ovens are connected by the RS232C interface to one PC, each oven requires a corresponding interface on the PC as well as a separate cable.
The maximum cable length is 15 m.
For connection of the oven to the PC there is a 9-pin connector on the back of the oven. The oven can be connected to the PC using a screened interface cable. The screen has to be connected to the plug case. If the serial interface is not being used, the cover supplied has to be fitted !



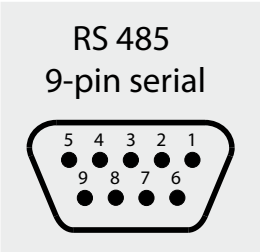
1	2	3	4	5	6	7	8	9
not used	RXD	TXD	not used	GND	not used	not used	not used	not used



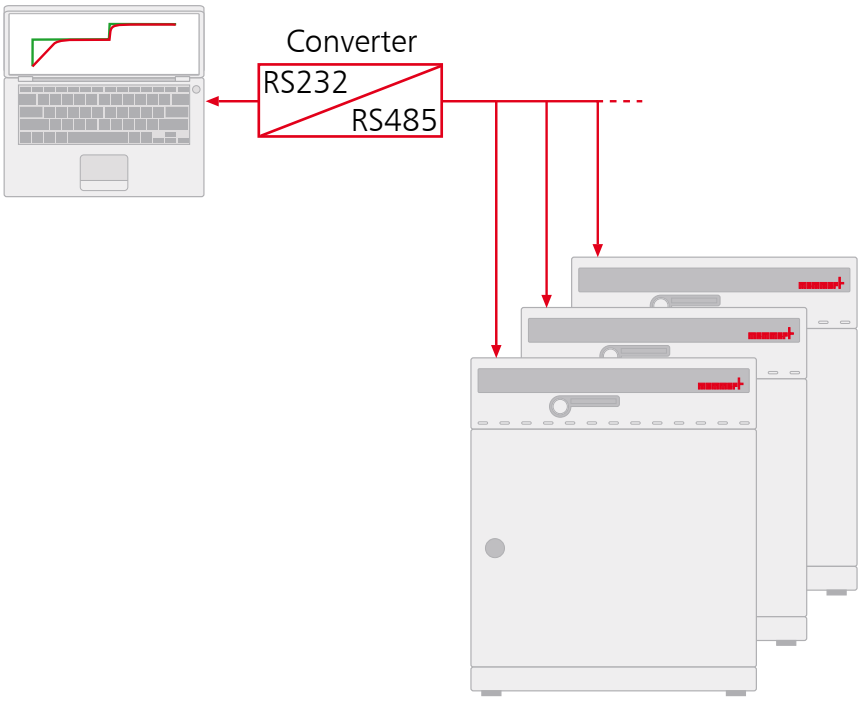
25.3 Bus interface RS485 (option)

When so ordered, the oven can be equipped at the factory with an RS485 interface instead of the RS232C interface. This permits networking of several ovens (up to 16) with a single PC using a common 2-wire circuit. The system is operated using the "Celsius 2007" software. A unique device address has to be assigned to the oven in sub-menu SETUP, option ADDRESS. This is the address through which the PC communicates with the oven. The default setting is ADDRESS 0. Using this address each oven can be addressed by the PC and programmed.

For this purpose the PC must be equipped with an RS485 interface or must be fitted with an RS232/RS485 converter. The cabling has to suit the individual location using a screened cable. The maximum total length of the cable is 150 m.
A maximum of 16 devices can be addressed on the RS485 bus. A termination resistance of 220 Ohm has to be connected to the last device.



1	2	3	4	5	6	7	8	9
not used	not used	A	not used	not used	not used	not used	B	not used



26 Log memory

The controller continuously records all relevant measurements, settings and error messages at 1-minute intervals.

The internal log memory is arranged as a ring memory, i.e. the new data always overwrite the oldest report data.

The report function can not be switched off but remains active at all times. The data are stored in the controller, protected against any manipulation. The controller memory can be read to produce documentation.

Every data set is stored with a unique date stamp.

The size of the internal log memory is 1024kB. This corresponds to a memory capacity of approximately 6 months' continuous operation.

During ramp operation a larger amount of data are stored in the memory so that the maximum report duration may be reduced.

If the power supply is interrupted, the instants of power failure and restoration of power are stored in the controller.

26.1 Reading the log memory

Past report data can be printed either via the RS232C interface or by a PLC3-compatible printer connected to the oven.

26.2 Reading the log memory into the PC via RS232C

Using the "Celsius 2007" program the record memory of the controller can be read via the RS232C interface into a PC where it can be shown graphically, printed, and stored in memory.

Note:
The log memory of the controller is not altered or cleared by the reading procedure.

26.3 Printing the log memory from the oven

(only for oven models with printer ports)

(see Section: „Printer")

If the printer is not ready, e.g. cartridge empty or no paper, no report data are lost. Prints can be repeated several times since the log memory is not cleared after printing.

The GLP data header is automatically included in the print-out: it contains the following information:
- Printing date
- Time period of report
- Running page number
- Serial number and oven designation

27 Memory card: MEMoryCard XL

A temperature programme with up to 40 ramps can be programmed on the MEMoryCard XL. Programming can take place directly on the controller or through the PC program "Celsius 2007".
For improved clarity it is recommended that extensive programmes are prepared graphically on the PC. Where a MEMoryCard XL is programmed, it can be read only on the same oven type for which it has been programmed.
Marking:
The text field of the MEMoryCard XL can be marked individually with text or diagram.

27.1 Programming the MEMoryCard XL from the oven

Insert the MEMoryCard XL into the slot in the control panel field.
The selected settings are written directly to the card and stored on it. After the card has been removed, the programme stored internally in the controller becomes again activated.

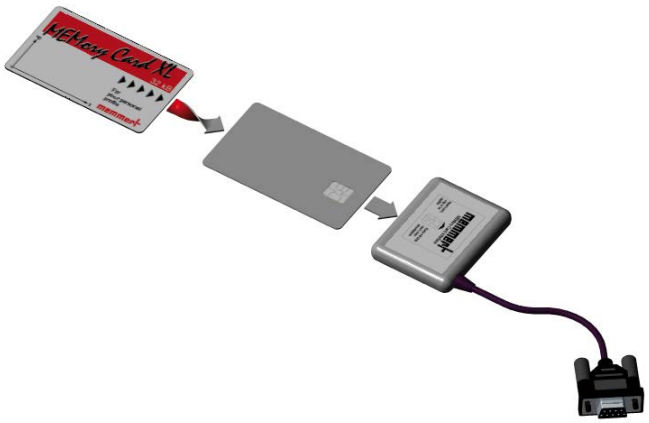
27.2 Programming the MEMoryCard XL from a PC with the oven

Link the PC to the oven with an interface cable via the serial interface (see Section: „Communication interface"). Insert the MEMoryCard XL into the input slot in the control panel field.

Write protection:
The MEMoryCard XL can be provided with write protection using the PC program "Celsius 2007". The programme on the card can then not be altered on the controller.

27.3 Programming the MEMoryCard XL from a PC using the read-write unit

Using a read-write unit (which can be purchased separately) the MEMoryCard XL can be programmed from a PC with "Celsius 2007" without any connection to an oven. It is important to ensure that the MEMoryCard XL has to be inserted with the contact field pointing upwards towards the marking of the read-write unit.



Note:

The programme remains stored on the MEMoryCard XL after the card has been removed from the unit. It can however be overwritten at any time by the PC using "Celsius 2007".

Details on programming the MEMoryCard XL with PC and "Celsius 2007" can be found in the Celsius Operating Manual and in the Online Help.

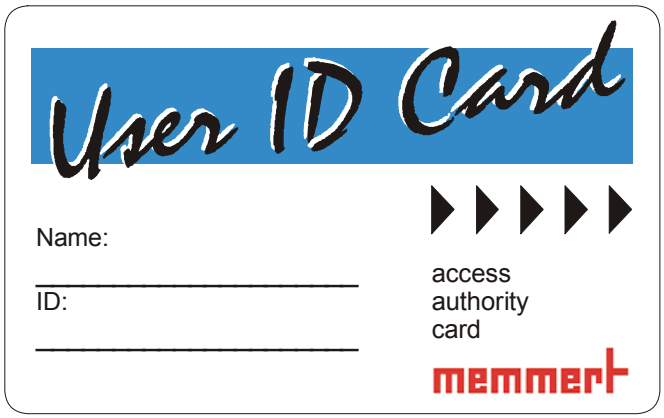
27.4 Documentation on MEMoryCard XL

The actual temperatures can be documented continuously on the MEMoryCard XL while the programme is running from the chip card. After the programme has been completed they can be read and printed using "Celsius 2007". The operation is described in the "Celsius 2007" Operating Manual.

A certain amount of storage space is provided for documentation depending on the programme duration. The sampling rate is set automatically by the controller depending on the programme duration.
With a programme duration up to 270 hours the documentation of the actual values on the MEMoryCard XL takes place with a 1-minute cycle. With programmes of longer duration the sampling time is extended up to 30 min max.

Documentation is started afresh on each programme start; the old report data are overwritten.

28 User-ID-Card (available as optional extra)



The User-ID-Card stores the serial number of the oven and a unique user number in encrypted format. The User-ID-Card therefore functions only in the oven with the corresponding serial number.

Each log-on via the User-ID-Card is documented in the internal flash memory.

If the User-ID-Card is inserted, the SETUP menu includes the additional item ID-LOCK. When the setting is changed to ON, all changes to the oven are blocked after the chip card has been removed.

The blockage through the User-ID-Card is indicated by the illuminated key symbol on the control panel.

Important:
If the oven is blocked through the User-ID-Card, there is no programme operation with the MEMoryCard XL since that card could be removed at any time and reprogrammed externally.

29 Cleaning

Regular cleaning of the easy-to-clean inside of the chamber prevents deposits which over time can detract from the appearance and the functionality of the stainless steel chamber .

The metal surfaces of the oven can be cleaned with commercially available cleaning agents for stainless steel. It is important to ensure that no rust-forming object comes into contact with the chamber or the stainless steel casing. Rust deposits cause infection of the stainless steel.

If any contamination causes rust stains on the surfaces of the chamber, such spots must be cleaned off immediately and the area polished.

The control panel, the plastic input modules and other plastic components of the oven must not be cleaned using scouring cleaning agents or those containing solvents.

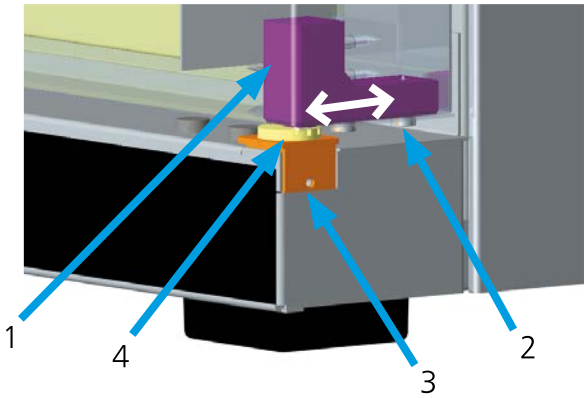
30 Maintenance

Important for a long life of your MEMMERT product and in case of warranty claims.

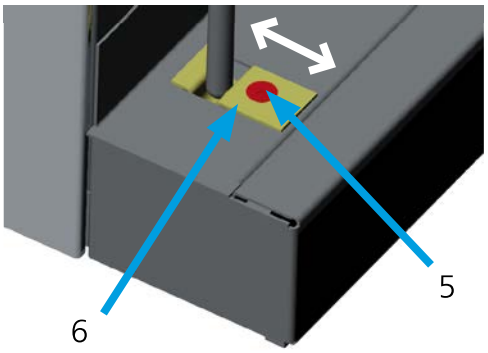
Note:
Any work involving opening up the oven must only be carried out by a suitably qualified electrician!

MEMMERT products require little maintenance. It is however recommended to lubricate all moving parts of the doors (hinges and closure) once a year (or 4 times a year with continuous operation) using a thin Silicone grease, and to check that the hinge screws are tight.

A well-closing door is essential on an oven. On Memmert ovens, tight closure of the door is ensured by a seal on the oven and another one on the door. In continuous operation the flexible sealing material may take a permanent set. Readjustment may then be necessary in order to ensure proper closing of the door.



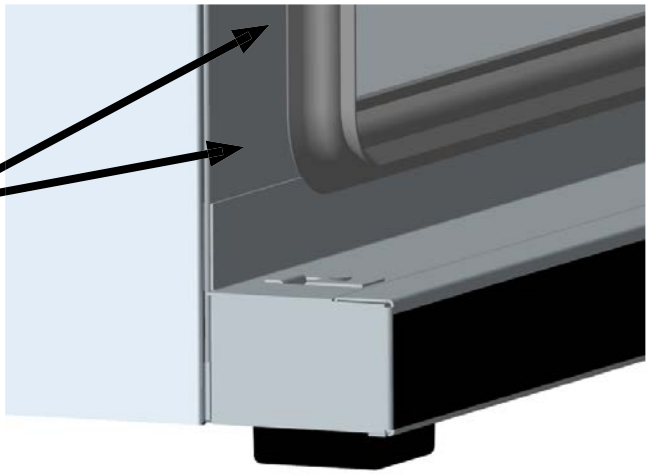
- The top part (1) of the door hinge can, after releasing the 2 screws (2) at the top or bottom of the door, be moved slightly in the direction of the arrow.
- The door can be adjusted after releasing the socket screw (3) and rotating the excentric (4) by means of a screwdriver. NOTE ! Screw (3) is locked with locking varnish. It can be released by a sharp tug using a hexagon socket key. Apply more locking varnish to screw (3) and tighten it.

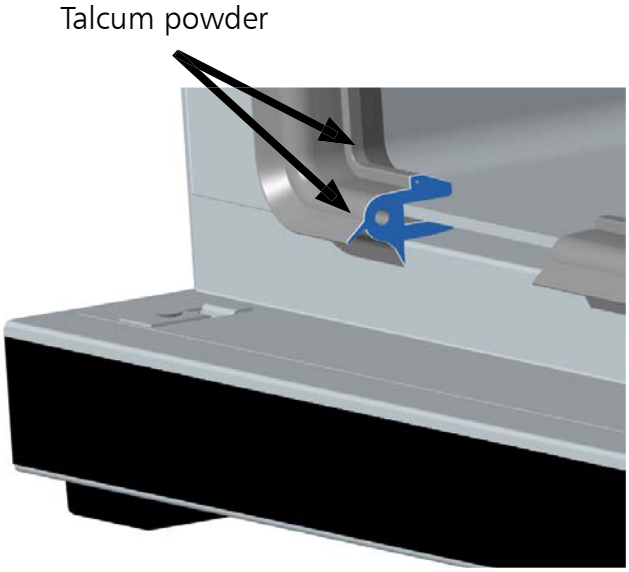


The closing panel (6) can also be adjusted in the direction of the arrow after releasing the screw (5). It is important that the panel is then screwed down firmly.

31 Door seal

The areas indicated should always be dusted with talcum powder.

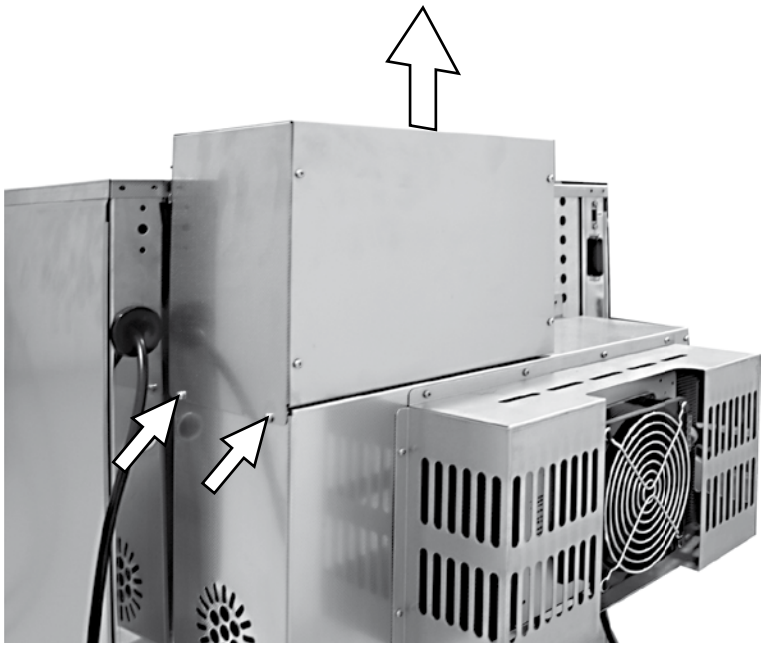




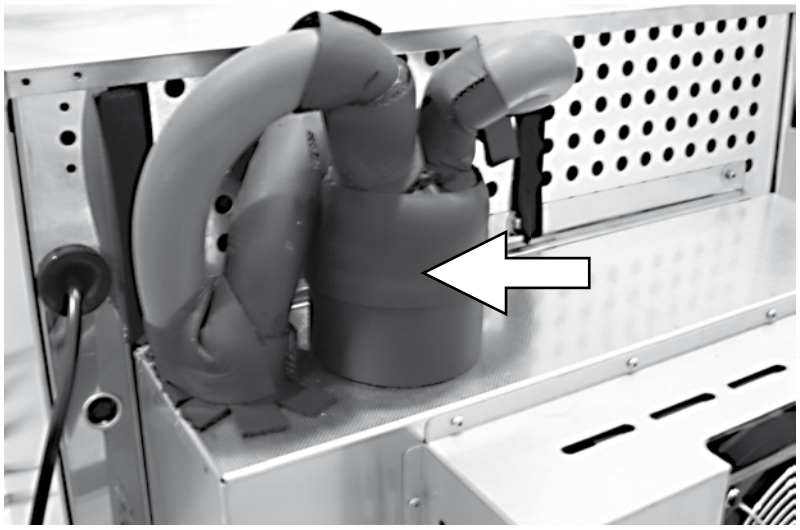
32 Check the cooling liquid of the CDP Peltier cooling unit

Once a year, check whether there is enough coolant in the CDP Peltier cooling unit on the back of the appliance. Replacement coolant can be ordered from MEMMERT.

1. Remove the lid of the coolant container. In order to do so, remove both screws located on either side of the appliance and raise the lid to remove.



2. The coolant container (arrow) is encased with insulating material. Carefully remove the cladding and check the coolant level. The container has to be at least half full. If not: Refill cooling fluid
3. Re-attach the cladding.
4. Put the lid back on and secure.



32 Error messages

Error	Cause	Rectification
Main switch switched on, display remains dark	Check power supply, fuse has blown	Check power supply Have fuse checked by an electrician
Display "---" in temperature display	Fault Pt100 sensor on thermoshelf, or tray not correctly inserted	Fully insert the thermoshelf, or check it at another heating level
Thermoshelf does not heat up, yellow heating LED is alight	Fault internal temperature fuse of thermoshelf	Return thermoshelf to customer service for checking
Red alarm symbol is alight continuously	Temperature limiter activated	See Section: „Mechanical temperature monitor: temperature limiter (TB)"
Appliance does not cool down	CDP Peltier cooling unit is not connected or switched off	Connect the CDP Peltier cooling unit to the power supply
Indication "E-1.1" Indication "E-2.1"	Fault power unit at heating level 1	Customer service
Indication "E-1.2" Indication "E-2.2"	Fault power unit at heating level 2	Customer service
Indication "E-1.3" Indication "E-2.3"	Fault power unit at heating level 3	Customer service
Indication "E-1.4" Indication "E-2.4"	Fault power unit at heating level 4	Customer service
Errormessage "E-3" in print display	Fault pressure sensor	Customer service
Errormessage "E-L1"	Error communication to power unit L1	Customer service
Errormessage "E-L2"	Error communication to power unit L2	Customer service
Errormessage "E-LA"	Error communication to all power units (possibly controller faulty)	Customer service

As far as VO appliances are concerned, error messages are shown in the alphanumeric display.
In case there is a fault on the oven, please get in touch with an authorised service organisation or contact the Memmert customer service department.
When dealing with the service department always quote the product serial number on the oven label.

33 Supply failure

Supply failure in operating mode "Normal operation"

After a supply failure the operation is continued with the set parameters. The instant and duration of the supply failure are documented in the record memory.

Supply failure in operating mode "Weekly programmer"

After a supply failure the operation is continued with the set parameters. The instant and duration of the supply failure are documented in the record memory.

Supply failure in programme operation

After a supply failure lasting less than 60 minutes the current programme is continued at the point where it was interrupted. The instant and duration of the supply failure are documented in the log memory.
On a supply failure lasting longer than 60 minutes the oven immediately starts in manual operation for safety reasons and all settings are set to safe default values (see table).

Supply failure in remote operation

On a supply failure in remote operation the oven immediately starts in manual operation for safety reasons and all settings are set to safe default values (see table). Programme continuation has to take place from the PC. The instant and duration of the supply failure are documented in the log memory.

Parameter	Default-value
Temperature	20 °C
Pressure	1100mB

EC Declaration of Conformity

Manufacturer´s name and address:	MEMMERT GmbH + Co. KG Äußere Rittersbacher Straße 38 D-91126 Schwabach
Product:	Vacuum-drying-oven
Type:	VO …
Sizes:	200 / 400 / 500
Nominal voltage:	AC 230 V 50 / 60Hz

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

2004/108/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 61326:2004-05	**EN 61326:1997** **EN 61326/A1:1998** **EN 61326/A2:2001** **EN 61326/A2:2003**

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

2006/95/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):2002-08	**EN 61 010-1:2001**
DIN EN 61 010-2-010 (VDE 0411 part 2-010):2004-06	**EN 61 010-2-010:2003**

Schwabach, 03.07.08

(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:	Peltier cooling unit
Type:	CDP
Sizes:	115
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

2004/108/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 61326-1:2006-10	**EN 61326-1:2006**
DIN EN 61000-3-11:2001-04	**EN 61000-3-11 :2000**

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

2006/95/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):2002-08	**EN 61 010-1:2001**
DIN EN 61 010-2-010 (VDE 0411 part 2-010):2004-06	**EN 61 010-2-010:2003**

Schwabach, 03.06.09

(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.

Standard ovens (VO) are safety-approved and bear the test marks:

CE	VDE EMV	DVE GS geprüfte Sicherheit

	This product is subject to the Directive 2002/96/EC by the European Parliament and the EU Council of Ministers which concerns Waste Electrical and Electronic Equipment (WEEE). This product has been put on the market after 13 August 2005 in countries which have already incorporated this Directive into National Law. It should not be disposed off as part of domestic refuse. For disposal please contact your dealer or the manufacturer. Products which are infected, infectious or contaminated with health-endangering substances are excluded from return. Please note also all further regulations in this context.

35 Address and customer service

MEMMERT GmbH+Co.KG
PO Box 17 20
91107 Schwabach
Germany
Phone: (+49) (0)9122 / 925-0
Fax:: (+49) (0)9122 /14585
E-mail: sales@memmert.com
Internet: www.memmert.com

Customer service:
Phone: (+49) (0)9122 / 925-143
or (+49) (0)9122 / 925-126
E-mail: service@memmert.com

When contacting customer service, always quote the product serial number on the oven label.

ISO memmert 9001

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08/2017
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