BINDER
Best conditions for your success

Operating Manual

APT.Line Serie BD / ED / FD (E1)

Microbiological incubator
Heating oven
Drying oven

BINDER GmbH
Postfach 102
D-78502 Tuttlingen

Tel.: ++49 (0) 74 61 / 17 92 - 0
Fax: ++49 (0) 74 61 / 17 92 10
http://www.binder-world.com
E-mail: info@binder-world.com
Service Hotline: ++49 (0) 74 62 / 94 73 - 99
Service Fax: ++49 (0) 74 62 / 94 73 - 98
Service E-mail: service@binder-world.com

Issue 10/2002 Art.- No. 7001-0002

D – 78532 Tuttlingen, 10. 07. 2000

EG - KONFORMITÄTSERKLÄRUNG
EC - Declaration of Conformity

(nach 73/23/EWG)
(acc. to 73/23/EEC)

Erzeugnis/ Product:	Mikrobiologischer Brutschrank Microbiological incubator
Typenbezeichnung/ Type:	BD 53; BD 115; BD 240; BD 400; BD 720
Nennspannung/ Nominal voltage:	1/N/PE AC; 230V; 50/60Hz

Nennaufnahme/ Nominal power:	BD 53:	0,4 kW;	BD 115:	0,4 kW;
	BD 240:	0,68 kW;	BD 400:	0,85 kW;
	BD 720:	1,25 kW		

Dieses Produkt entspricht den folgenden Produktspezifikationen:
This unit corresponds to the following product specification:

Sicherheit/safety:

DIN VDE 0700-1: 04.88 (HD 251 S3 and Amendment 1-3); DIN 12880-1: 11.78

EMV/EMC:

EN 55014: 1993; EN 50082-1: 1994

Dieses Gerät entspricht den Anforderungen der Niederspannungsrichtlinie 73/23/EWG und der EMV-Richtlinie 89/336/EWG und trägt entsprechend die Kennzeichnung CE.
This unit corresponds to the demands of the low tension directive 73/23/EEC and to the directive 89/336/EEC and, corresponding to this, it bears the CE-mark.

BINDER GmbH

P. M. BINDER
Geschäftsführender Gesellschafter
Managing Director

Dipl.-Ing. M. Schneider
Konstruktion und Produktsicherheit
Construction and Product Security

D – 78532 Tuttlingen, 10. 07. 2000

EG - KONFORMITÄTSERKLÄRUNG
EC - Declaration of Conformity

(nach 73/23/EWG)
(acc. to 73/23/EEC)

Erzeugnis/ Product:	Wärme-/Trockenschrank/Heißluftsterilisator Oven/Drying oven/Hot air sterilizer
Typenbezeichnung/ Type:	ED/FD 53; ED/FD 115; ED/FD 240; ED/FD 400; ED/FD 720
Nennspannung/ Nominal voltage:	ED/FD 53 bis/to ED/FD 240: 1/N/PE AC; 230V; 50/60Hz ED/FD 400 und/and ED/FD 720: 3/N/PE AC; 400V; 50/60Hz
Nennaufnahme/ Nominal power:	ED/FD 53: 1,20 kW; ED/FD 115: 1,60 kW; ED/FD 240: 2,70 kW; ED/FD 400: 3,40 kW; ED/FD 720: 5,00 kW

Dieses Produkt entspricht den folgenden Produktspezifikationen:
This unit corresponds to the following product specification:

Sicherheit/safety:

DIN VDE 0700-1: 04.88 (HD 251 S3 and Amendment 1-3); DIN 12880-1: 11.78

EMV/EMC:

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BINDER GmbH

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Content:

1. Safety information

Dear customer,

To ensure correct operation of the precision warming chamber BE / ED / FD you must read and understand the operating manual in full. In accordance with CE directives important sections are denoted by the following symbols:

Symbols used

This symbol draws your attention to information in the operating manual which you should read, in order to avoid injuries to people. The procedure should only be continued if the specified conditions have been understood and fulfilled.

This symbol draws your attention to information in the operating manual which you should read, in order to prevent damage to the product.

Information which describes the operation of the equipment, in order to prevent accidents due to electric shock or damage to the equipment due to excess voltage.

Information which must be observed.

Technical information

General information

This symbol draws your attention to hot surfaces, which can lead to burnings upon contact Do not touch !

1.1 Unit Overview BD

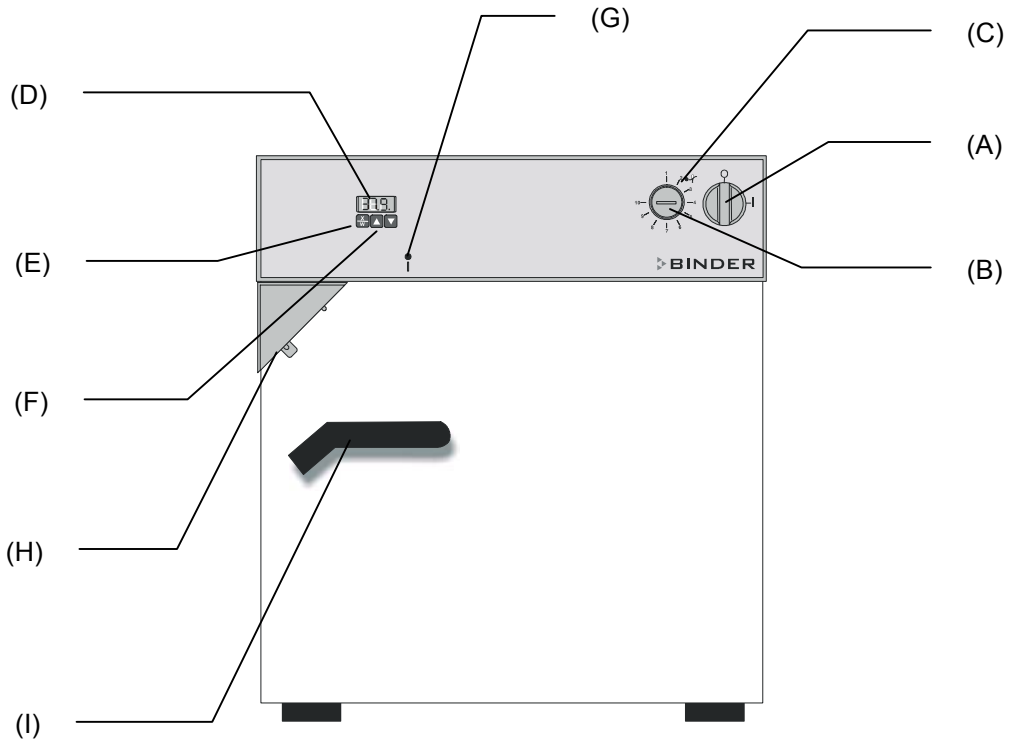


Fig. 1: Microbiological incubator BD

A) On/off switch (main switch)
B) safety device class 3.1 (TWW)
C) Red alarm lamp for TWW (safety device)
D) Digital display
E) Actual value/nominal value button
F) Up/down buttons
G) Green LED (ready for operation LED timer active)
H) Lever for ventilation slide
I) Lever door open/close

1.2 Intended use BD

Microbiological incubator BD are designed for exact temperation of harmless materials. Because of their precise temperature accuracy these devices are especially useful for incubation of cultures at a standard temperature of 37°C. The solvent content must not be explosive or flammable. In other words, it must not at any time, irrespective of its concentration in the steam room, be able to form an explosive mixture with air. The nascency of flammable or explosive dusts must be inhibited. The drying temperature must lie below the flash point or below the sublimation point of the charging material.

The user should be informed about the physical and chemical properties of the charging material, as well as the contained moisture constituent and its behaviour under addition of heat energy.

The user must inform himself about any potential health risks caused by the charging material, the contained moisture constituent or by reaction products which may arise during the drying process. The user must take adequate measures to exclude such risks prior commissioning the temperature chamber.

The device can be operated in a temperature range of + 5°C above room temperature up to + 99,9°C.

1.3 Unit Overview ED / FD

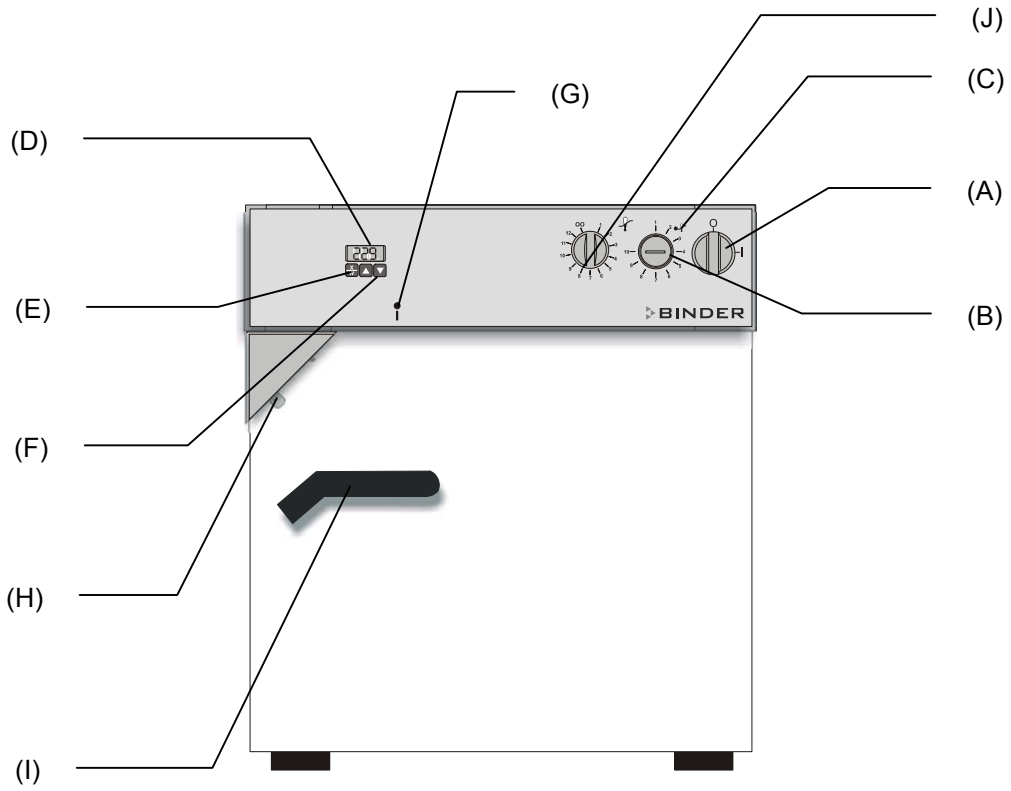


Fig. 2: Drying oven ED/FD

A) On/off switch (main switch)
B) safety device class 2 (TWB) or optional class 3.1 (TWW)
C) Red alarm lamp for safety device
D) Digital display
E) Actual value/nominal value button
F) Up/down buttons
G) Green LED (ready for operation)
H) Lever for ventilation slide
I) Lever door open/close
J) 0-24 hour timer

1.4 Intended use ED / FD

The heating and drying oven ED/FD are suitable for drying and heat treatment of solid or pulverised charging material, as well as bulk material, using the supply of heat. The solvent content must not be explosive or flammable. In other words, it must not at any time, irrespective of its concentration in the steam room, be able to form an explosive mixture with air. The nascency of flammable or explosive dusts must be inhibited. The drying temperature must lie below the flash point or below the sublimation point of the charging material. The user should be informed about the physical and chemical properties of the charging material, as well as the contained moisture constituent and its behaviour under addition of heat energy.

The user must inform himself about any potential health risks caused by the charging material, the contained moisture constituent or by reaction products which may arise during the drying process. The user must take adequate measures to exclude such risks prior commissioning the temperature chamber.

Due to the special demands of the Medical Device Directive (MDD) this ovens are not qualified for sterilisation of medical devices in sense of the directive 93/42/EWG.

The device can be operated in an area temperature range of 5°C above room temperature up to 300°C.

2. Unit description

BINDER precision heating cabinets have been carefully manufactured and developed by means of modern production facilities.

All units are subject to careful inspection. Should you have reasons for complaint, please get in contact with your retailer.

The inside, the preheating chamber, and the inside of the door (including front frame) are made of stainless steel (material no. 1.4301 in Germany). The housing is powder coated and coloured in RAL 7035. All corners and edges are completely coated.

The models 720 are equipped with four lockable rollers.

BINDER BD/ED/FD-series multi-purpose cabinets and high-precision incubators are heated electrically and are ventilated naturally or by fan-assisted, forced-air circulation (FD-series).

They comply with German VDE (electrical) regulations and DIN Standard 12880, and are subject to detailed testing in accordance with VDE 0113.

BINDER BD/ED/FD-series products are equipped with an electronic PID-controller with digital display.

The electronic PID controller can be fed with a set-point within the range of +5 degrees above room temperature to +300 degrees (BD + 99,9°C).

3. Factory calibration

This unit became calibrated and justified in factory. Calibration and justification are performed using standardised test instructions according to the QM-system of DIN EN ISO 9001 applied by BINDER (certified in December 1996 by TÜV CERT under registration number 70 100 M 926). All test equipment used are subject to the administration of measurement and test equipment which is also constituent part of the QM-systems of DIN EN ISO 9001. They are controlled and calibrated in relation to a DKD-Standard on regular intervals.

Factory calibration:

- ED / FD middle of usable volume at 150°C
- BD a middle of usable volume at 37°C

The chambers are aligned at this respective temperature.

4. Warranty

BINDER products are manufactured with great care and checked carefully prior to delivery (VDE-piece checked).

1. Should your BINDER product have a defect or fault, we will repair it – as long as it is a new BINDER product – cost free if the defect or fault occurs within 12 months after the delivery. This period will be extended to 24 months, starting with the delivery, provided that all maintenance work service and potential repair work within the first 12 months is carried out by us or authorised service stations.

2. If there should be a defect or fault of your BINDER product within the time span mentioned above, you shall inform the company from which you purchased the BINDER product or us directly.

3. All deadlines respectively periods mentioned above start with the delivery of a new BINDER product to the end buyer. The meeting of the deadline shall be proved by presenting the invoice or delivery note.

4. In case a BINDER product has a defect or fault, we will either replace the defective product by a new one or repair the defective product at our discretion (so called post performance – “Nacherfüllung”). All parts replaced in the course of such a repair pass into our property. Deadlines mentioned under Art. 1 above will not be prolonged by repair work. In case post performance should fail, you shall have the legal rights according to German Law (withdrawal from contract or reduction of price) provided the defect or fault occurs within the first 12 months. If the 24 months period should be relevant and additionally post performance should fail, you shall have the right of price reduction only.

5. In case the defect should occur within 12 months after delivery, we will take over all costs necessary for the repair of the defect, especially transportation, travel and labour costs; it is our decision whether the defect is repaired at location where the BINDER product is operating or whether the BINDER product has to be sent to us. In case the 24 months period should be relevant, you shall send the defective BINDER product at your cost to us or the company from which you purchased the BINDER product. Only if such transport should go along with extraordinarily high costs, we shall repair the BINDER product at your premises.

6. In case you have to send back a BINDER product, the BINDER product has to have the original packaging or a comparable and adequate one.

7. You lose our warranty as laid down in this document in case the defect or fault is caused by repair or intervention of non authorised persons. The same shall apply if you have attached non suitable parts or accessories to the BINDER products and if those parts or accessories have caused the defect or fault.

8. All rights or claims going beyond the ones described above, especially concerning the right of compensation of potential damages which might be caused by BINDER products shall be excluded provided that such exclusion is not prohibited by the governing law.

9. If you should send a BINDER product to us for repair or other reasons we only accept the BINDER product when you present a so called **authorisation number** which has been given you before. We will give you the authorisation number after receiving your complaint in writing or via telephone prior to sending (back) the BINDER product to us. The authorisation number will be presented after having received the following information:
   - BINDER product type and serial number
   - Date of purchase
   - Name and address of the dealer from which you bought the BINDER product
   - Exact description of defect or fault
   - Your full address; if possible contact person and availability of that person
   - Exact location of the BINDER product
   - **Contamination clearance certificate via fax in advance!**

   The authorisation number shall be attached on the packaging respectively on the delivery papers clearly visible and easily to recognise. **We cannot accept your delivery if it does not carry an authorisation number for security reasons!**

IMPORTANT NOTICE:
Any warranty repair maintenance or service work may only be carried out by persons or companies being properly authorised by us. If you should not know an authorised service station, please contact us and we will name you our service partner closest to you. Otherwise we will carry out the necessary work ourselves.

5. Installation

5.1 Ambient conditions

Permissible temperature range:	Storage: -10°C ... 60 °C Operation: 5°C ... 40 °C
Permissible humidity:	Operation and storage: 70 R.H.% not condensing
Altitude of the site:	Max. 2000m above the sea level
Unit specification acc. to EN 1010-1:	Installation category II, Pollution degree 2

The ambient temperature should not be substantially higher than 32° C. The specified technical data relate to an ambient temperature of 22° C. The data may be modified in the case of different ambient conditions. Temperature fluctuations may occur in the case of excessively high room temperatures.

5.2 Unpacking and inspection

After having unpacked, please check the unit and its accessories for completeness and for possible transportation damage. If transportation damage has occurred, the carrier must be informed immediately. Please remove any transportation protection devices and adhesives in and on the unit and take out the operating manuals and accessory equipment.

5.3 Transport safety device

- The unit has to be installed on a plain surface.
- The oven has to be fixed with transport straps in order to avoid that the unit is sliding or tilting.
- The oven may not be transported without packing.
- Roller-mounted units can be locked in place

5.4 Possibilities for installation

The unit should, where possible, be installed on an even, non-flammable surface. In order to ensure optimum operation, the unit should be aligned with a spirit level. If several units of the same size are installed next to each other, a minimum distance of 160 mm must be ensured. Two devices with a construction size of up to 240 can be piled on top of each other. For this purpose the BINDER rubber layers must put under all four feats of the upper chamber to prevent the device from slipping.

6. Safety instructions

For operation of the units and its location, the guidelines for laboratories ZH 1/119 (for Germany) of the professional association concerned with occupational safety should be observed. The appliance must not be set up in unventilated niches.

No combustible or explosive materials must be introduced to the units. The units must not be used for drying or heat treatments in which combustible vapours are released which could form an explosive mixture with air. The nascency of flammable or explosive dusts must be inhibited. The unit are manufactured in accordance with the relevant VDE regulations and subjected to a routine check test in accordance with VDE 0113.

When installing the unit, please ensure that it is positioned on an even, non-flammable surface, so that it is level and vibration-free. The unit must not be lifted or transported using either the door handle or the door.

This symbol draws your attention to hot surfaces, which can lead to burnings upon contact. Do not touch !

7. Commissioning

Danger of incorrect supply voltage connection values!

If the mains plug is connected to a socket which does not comply with the prescribed specifications, the unit may be damaged.

The following points must be noted when connecting to the electricity supply:

The supply voltage must be checked prior to connection and initial start-up. The actual values must be compared with the data on the type plate.

The regulations of the local electricity supply company and the VDE regulations (for Germany) must be observed.

- Check of the power supply
- For ratings see nameplate
- Set on/off switch (A) in position |
- The green LED (G) indicates ready-to-operate-status

7.1 Temperature control adjustments

Figure (3) and Figure (4) show the arrangement of the temperature R2 control. The safety device (B) must be reset every time the set-point for temperature has been changed (see chap. 8). In this case only correct functioning of the unit can be guaranteed.

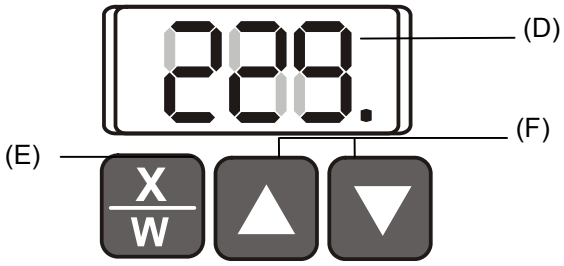


Fig. 3: Temperature control R2 ED/FD (up to 300 °C)

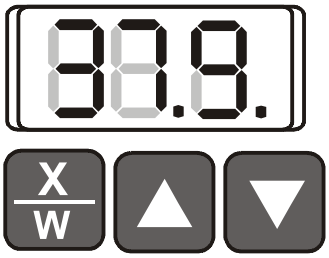


Fig. 4: Temperature control R2 BD (up to 99,9 °C)

7.2 Entering set-point

1. Press set-point key [X/W] (E) once

2. Enter desired set-point using the [▲] [▼] keys (F)

The right dot on the display flashes if the unit is in condition “heating active”. If no key will be pressed within 10 seconds, the display reverts automatically to the original current value. Each time the set-point is changed, the TWW safety device setting should be observed (chapter 8).

Type ED/FD can be operated in an area temperature range from + 5°C above room temperature up to 300°C. The display has an accuracy of 1°C (see Fig. 3).

Type BD devices can be operated in an area temperature range from + 5°C above room temperature up to + 99,9°C. The display has an accuracy of 0,1°C (see Fig. 4).

7.3 0-24 hour timer ED / FD

Switches on and off the heater / fan-motor (at FD).

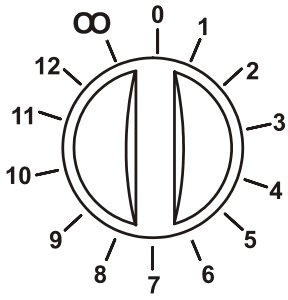


Fig. 5: 0-24 hour timer ED / FD

Adjustment:

In position zero (0) the heater (and the fan at FD) are permanently deactivated.

If the timer is set anticlockwise to position (∞), it assumes a locked condition and the chamber functions heater (and fan at FD) in the continuous operating mode.

The operating time of the heater and fan (at FD) can be set by turning the timer clockwise.

At the end of the expiring time heating (and fan at FD) goes off automatically.

The controller display remains in operation.

8. Safety devices

8.1 Safety device (TWB) class 2 (DIN 12880, Part 1) for ED/FD

The safety device (TWB) protects the unit, its environment and the charging material against impermissible excess temperatures. Please also observe the laboratory guidelines ZH 1/119 in this respect (for Germany).

In the event of a fault in the temperature controller, the safety device (B) switches off the unit **permanently**. This status is reported visually by the indicator lamp (C).
The operation of the safety device (B) is checked by moving it slowly anti-clockwise until it is switched off. The safety device cut-off is reported visually by the indicator lamp (C).

The safety device is then released again by pressing the reset button (Ba) and the unit is switched on as described.

Function:

The TWB is functionally and electrically independent of the temperature control device and switches off **permanently**.

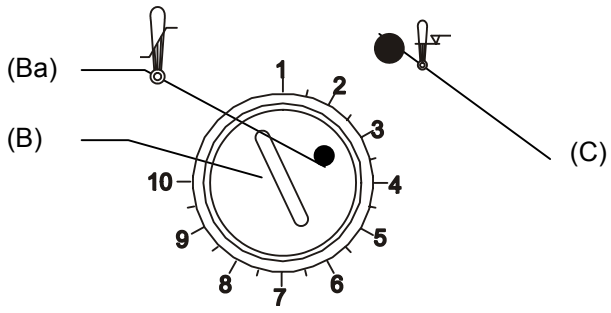


Fig 6: Safety device class 2

When the turning knob is set to the end stop (10), the TWB acts as a unit protection device. If the TWB is set somewhat higher than the nominal temperature selected on the controller, it acts as a material protection device. In the event that the safety device has switched off, which can be seen from the illumination of the red alarm lamp (C), the following steps must be performed:

- the unit must be disconnected from the mains
- the cause of the fault must be investigated and remedied by an expert
- release TWB by pressing reset button (Ba)
- restart the unit (see chapter 7)

Setting:

In order to check at which temperature the safety device activates, the unit must be started and the required nominal value set on the temperature controller.

- Use a coin to set the turning knob on the TWB to the end stop (position 10) (unit protection)
- After adjusting to the pre-selected nominal value, reset the TWB to the switching point (turn to the left)
- The switching point is indicated by the red alarm lamp (C); the reset button (Ba) jumps out.
- The optimum setting of the safety device is obtained by turning the knob to the right by around one graduation mark on the scale, at which point the red alarm lamp (C) will go out.
- Push the reset button (Ba) in again.

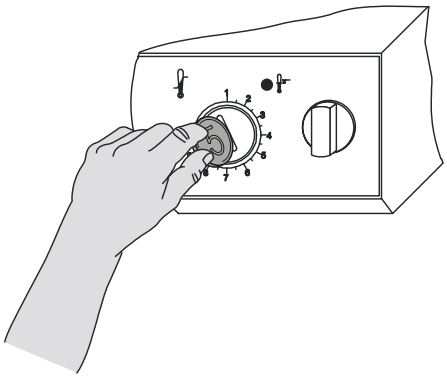


Fig. 7: Adjustment of the safety device

Notes:

The unit is only active when the reset button (Ba) is pushed in.

The scale division from 1-10 corresponds to the temperature range from 60° C up to maximal temperature and serves as a setting aid. When the TWB kicks in, the red alarm lamp (C) illuminates, the reset button (Ba) jumps out and the unit switches off permanently.

8.2 Temperature safety device (TWW) class 3.1 (DIN 12880) for BD (Option with ED/FD)

The temperature safety device (TWW) serves to protect the unit, its environment and the contents from forbidden temperature excesses.
Please also observe the laboratory guidelines ZH 1/119 (for Germany).

Function:

The TWW is functionally and electrically independent of the temperature control system and if an error occurs it assumes the regulatory function.

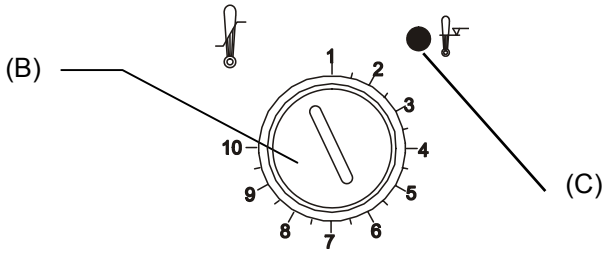


Fig. 8: safety device class 3.1

If the control knob is turned to its end-stop, the TWW functions as a safety device for the unit. If it is set to a temperature somewhat higher than that selected on the control, it functions as a protective device for the material under treatment. If the safety device has assumed the regulation function (identifiable by the red alarm lamp (C) lighting up), proceed as follows:

- Disconnect the unit from the mains
- The cause of the fault must be examined and rectified by a technician
- Start up the unit again as described in chapter 7

Adjustment:

To check the response temperature of the TWW, put the unit into operation and then set the desired set-point at the temperature controller.

- Turn the control knob of the TWW with a coin to its end-stop (unit protection)
- When the set-point is reached, reset the TWW to its trip point (turn it to the left)
- The trip point is identifiable by the red alarm lamp (C)

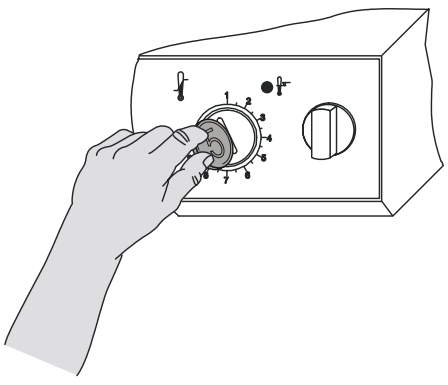


Fig. 9: Adjustment of the safety device

The optimum setting for the TWW is obtained by turning the control knob clockwise by approximately one scale division, which extinguishes the red alarm lamp (C). The sections of the scale from 1-10 corresponds to the temperature range from 5°C to maximal temperature (for option with ED / FD from 60°C to maximal temperature) and serve as a setting aid.

8.3 Class 3.3 safety device (option)

Optionally, the unit can be equipped with an additional safety device (TWW class 3.2). The device is set as for the TWW class 3.1. However, a minimum value for the temperature is set that the unit will not fall below due to the regulatory function of the class 3.2 TWW. This protection against excessively low temperatures can, for example, serve to protect sensitive cultures from under-cooling. The combination of the class 3.1 TWW and class 3.2 TWW can be regarded as a class 3.3 TWW.

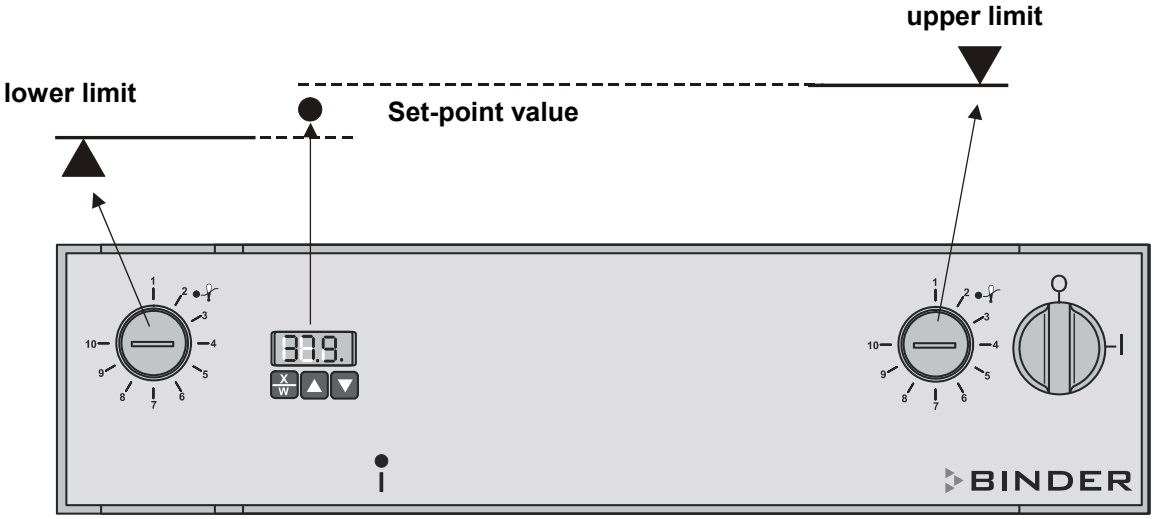
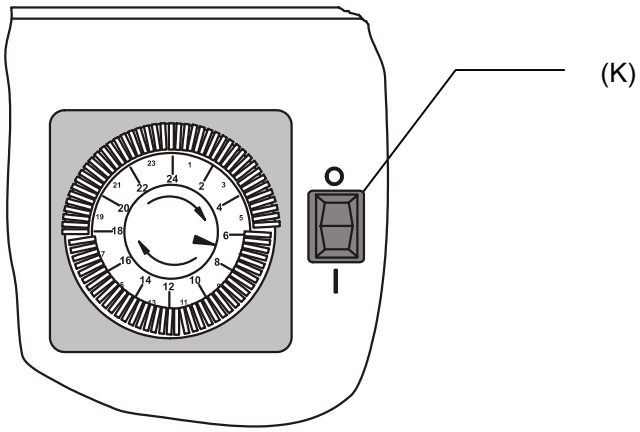


Fig. 10: safety device class 3.3

9. Options

9.1 Mechanical program timer with day program

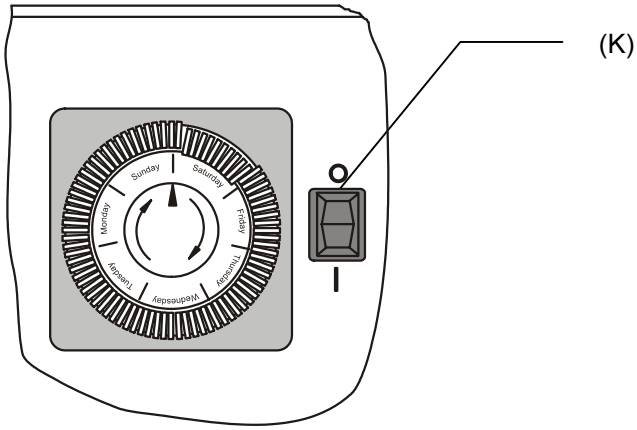
Function:
The option mechanical day program timer allows the unit to be turned on and off under program control. In this case, the day program timer turns the heating (and fan motor at FD) on and off. The temperature control display remains continuously active to permit readout of the current value.



Setting:
At start of operation, set the time of day on the program dial by turning to the right. Set desired timer on/off points by engaging the sliders. Engaged red segments of the scale show the on operating times. The minimum on/off frequency is 15 minutes. If the switch (K) is in position " | ", the unit is under timer control.

9.2 Mechanical program timer with week program

Function:
The option mechanical week program timer enables turning the unit on and off under program control. In this case, the week program timer turns the heating (and the fan motor at FD) on and off. The temperature control display remains continuously active to permit readout of the current value.



Setting:
At start of operation, set the time of day on the program dial by turning to the right. Set desired timer on/off points by engaging the sliders. The minimum on/off frequency is 2 hours. If the switch (K) is in position " | ", the unit is under timer control and the multifunction timer is inactive.

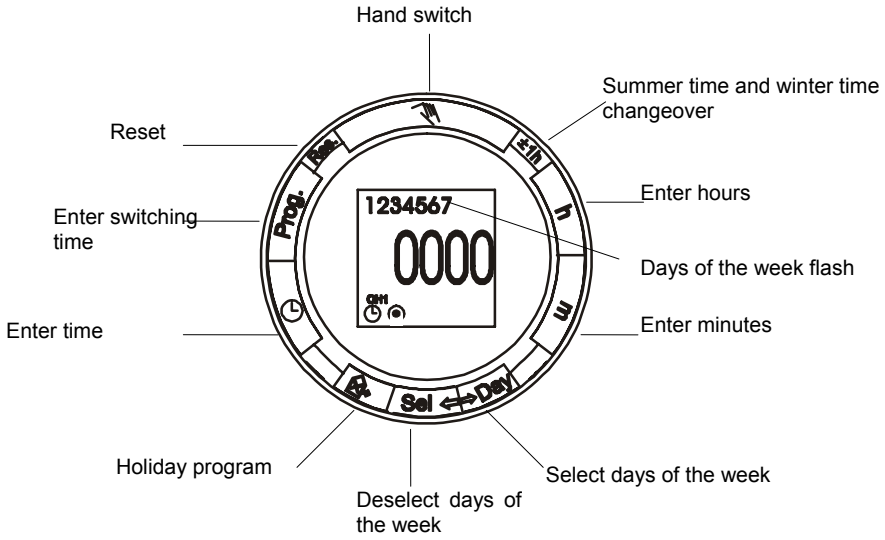
9.3 Digital program timer with week program

The switching function of the timer is only active if it is switched on at the switch beside the weekly program timer.

Function
The option digital week program timer enables turning the unit on and off under program control. In this case, the week program timer turns the heating (and the fan motor at FD) on and off. The temperature controller display remains continuously active to permit readout of the current value.

9.3.1 Operating the time switch

The steps marked with ➤ are required to execute a timer program.



9.3.2 Reset ➤

Press the **Res** button with a pencil or similar object. This will place the timer in the default state.

- before each restart
- to delete all on/off times and the time of day
- after approx. 2 seconds, **0000** appears in the display.

9.3.3 Enter time of day and current day of week ➤

1. After pressing the **Res** button (see 9.3.2)
2. During daylight saving time, press the **±h** button once
3. Hold the ◷ button down during steps 4-6
4. Use the **h** button: to enter the hour
5. Use the **m** button: to enter the minutes
6. Use the **Day** button: to enter the current day (1=Mo....7=Su)
7. Release the ◷ button

The colon now blinks at one-second intervals.

If the h/m buttons are pressed longer than 2 seconds, the values appear in rapid succession.

9.3.4 Entering on/off times ➤

You have 42 memory positions available.
Each on/off time requires one memory position.

1. Press the **Prog.** button repeatedly until an available memory position **--:--** is displayed.
2. Use the button to select the function ◉ =ON or ○ OFF.

3. Use the **h** button: to set the hours.
4. Use the **m** button: to set the minutes.

If an on/off command is to apply every day, continue with step 5. If an on/off command is to be issued on only one day or on certain days, skip step 5 and continue with step 6. If an on/off command is to issued every day, skip steps 6-8 and continue with step 9.

5. Use the **Prog.** button to save
   or
6. Use the **Day** button to select a day on which the command is not to be issued (cursor blinks)
7. Use the **Sel** button to confirm this day (day of week and cursor blink)
8. Press the **Day** button (day is deselected). Repeat steps 6-8 for each day that is to be repeated
9. Use the **Prog.** button to save (the next memory position will be displayed)
   or
10. Save using the ◷ button

The timer switches to the automatic state and displays the current time.
Begin each additional on/off time and the corresponding setting ◉ = ON or ○ = OFF with 9.3.2.

If an entry is incomplete, the display segments not yet selected will blink.

If you have deselected a day on which the on/off command should be issued:

1. Use the **Day** button to reselect the deselected day (day of week and cursor blink)
2. Use the **Sel** button to confirm this day (cursor blinks)
3. Press the **Day** button (day is again selected)
4. Use the **Prog.** button to save (the next available memory position will be displayed.

or

5. Use the ◷ button to save

Example
The heating (and the fan at FD) is to be activated at 9 p.m. and disabled again at 6 a.m.

- Press the **Prog.** button
- Press the button until ◉ appears
- Enter 21^{00} with the **h** and **m** buttons (2nd set-point)
- Press the **Prog.** button again.
- Press the button until ○ appears
- Enter 06^{00} with the **h** and **m** buttons (first set-point)
- Start automatic operation with the ◷ button.

9.3.5 Additional functions

9.3.5.1 Setting daylight saving and standard time

Press the ± **1h** button once.

9.3.5.2 Inactivating the automatic time change

1. Press the ± **1h** and **Day** buttons once simultaneously
2. Press the h button until **- -** appears (after the last day in the respective month)
3. Press the ◷ button. The timer switches to the current operational state.

At this point, the time change can be performed manually by pressing the ± **1h** once, or new data can be entered.

9.3.5.3 Manual on/off toggling

The ✋ button can be used at any time to toggle the current switch state. The entered on/off program, however, is not changed as a result.

Automatic operation ◷	Manual operation ✋	Continuous operation [◉] [○]
◷ ◉ = ON	◉ ✋ = ON	[◉] = Continuous ON
◷ ○ = OFF	○ ✋ = OFF	[○] = Continuous OFF
The on/off times corresponding to the entered program	If the current on/off state is changed manually, the next on/off command is carried out automatically after the entered program.	Return to automatic operation from states [◉] or [○] possible only by pressing the ✋ button

9.3.5.4 Retrieving the programmed on/off times

1. Press the **Prog.** button repeatedly
   - displays all entered on/off times beginning with the first memory position
   - thereafter, the first available memory position **--:--** is shown
   If all memory positions are assigned, **FR 00** appears in the display.
2. Press the ◷ button.

The timer switches to automatic operation and shows the current time.

9.3.5.5 Changing the programmed on/off times

Press the Prog. button repeatedly until the on/off time to be changed is displayed.
The new data can then be entered as described under 9.3.4.

Note on saving on/off times
If, after entering on/off times (9.3.4), programming is not terminated with the ◷ button, an automatic save of the entire on/off command is nevertheless performed after about 90 seconds. The timer then switches to automatic operation and again shows the current time.

9.3.5.6 Deleting individual on/off times

1. Press the Prog button repeatedly until the on/off time to be deleted is displayed.
2. Use the h or m button to set **- -** and press the ◷ button for about 3 seconds.

The on/off time is deleted. After releasing the button, the current time is displayed.

9.3.5.7 AM/PM time display

If the ± **1h** and **h** buttons are pressed simultaneously, the time display switches to AM/PM mode.

9.3.5.8 Holiday program

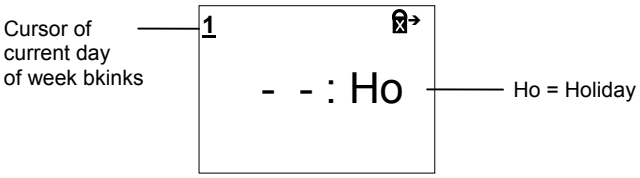
The holiday program has priority over the standard week program. The holiday program can be entered only when all 7 days (1,2,3,4,5,6,7) are selected.

Entry of on/off times as described under 9.3.4, points 1-4

For each on/off time, the button must be pressed as well. Save the holiday on/off times with the **Prog.** or ◷ buttons.

Entering duration and start of holiday program

1. After entry of on/off times for the holiday program
2. Press button once. The following graphic appears:



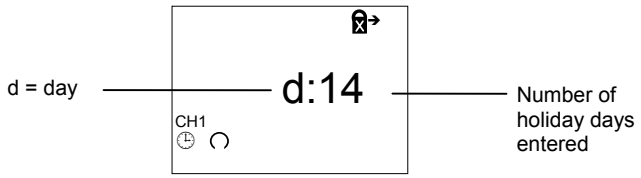
Graphic 1

3. If the holiday program is to begin on a day other than the current day - max. 6 days in advance - use the **Day** button to select the day on which the holiday program is to start. If the holiday program is to apply for up to 99 days, continue with steps 4 and 5. If the holiday program is to apply indefinitely, omit step 4 and continue with step 5.

4. With the **Sel.** button,. enter the desired number of holiday days (1 to at most 99 days)

5. Press the ◷ button to save the entries.

If the current day is given as the holiday start, the display shows:



Graphic II

Graphic II remains until the holiday days have been worked off. For example, d:10, d:09, d:08....., etc.
By again pressing and holding the ◷ button, the day of the week, time of day, and current on/off state - ◉ = ON or ○ = OFF - can be queried.

If a day other than the current day was specified as the holiday start, the current time is displayed after the ◷ button is pressed. At the start of the selected day, the holiday program is then started at midnight and the duration shown (**Graphic II**).

After the entered holiday days have passed, the display shows the current time.

Canceling the holiday program

- **If the holiday program has started, press the button once.**
- **If the holiday program has not yet started, press the button twice.**

10. Maintenance / Service

All work must be carried out only by qualified electricians or by technicians authorized by BINDER. Before maintenance work is performed, the unit must be de-energized. BINDER has established a maintenance interval of one year.

Service hotline:	0 74 62 / 94 73-99
Service fax:	0 74 62 / 94 73-98
Service e-mail:	service@binder-world.com

11. Cleaning and Decontamination

Danger of electric shock!

If the unit will become wet during operation or cleaning, the user is in danger of electric shock !
Water or cleaning agents must not be spilled over the inner and outer surfaces. In order to clean the unit, it has to be free of voltage and must be completely dry before switching it on again.
The outside and the inside of the unit may be cleaned with a moist cloth. In any case you may not pour any water into the oven. Also from the outside the unit may not be washed down or spilled over with water.

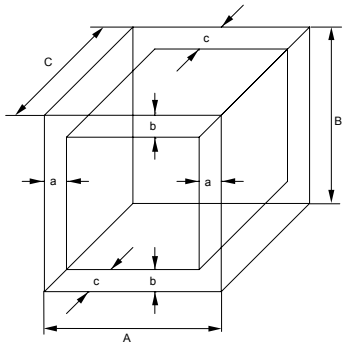
In case of impurity of the interior with biological or chemical hazardous goods there are three possible procedures. For every decontamination method must be taken care for adequate personal safety. The correct procedure depends on the constitution of the contamination and the loaded material.

- Units of series ED and FD can be hot air sterilised at 190°C for at least 30 minutes. All inflammable goods must be removed from the interior before.
- The inner chamber can be sprinkled with standard acid-free disinfectants. The unit must be disconnected from the power supply during the decontamination. The power plug must be pulled! Before start-up the unit has to be absolute dried out and ventilated, because explosive gases might be built during the decontamination process.
- Strongly contaminated inner chamber parts can be remove if necessary by an engineer for cleaning, or to remove them for new parts. The inner chamber parts can be sterilised in a sterilizer or autoclave

12. Technical data

12.1 Effective working space

The effective working space illustrated below is calculated as follows:



A, B, C = Internal dimensions (W, H, D)
a, b, c = Wall clearances

a = 0.1*A
b = 0.1*B
c = 0.1*C

V_{WORK} = (A-2 * a) * (B-2 * b) * (C-2 * c)

The technical data are related to the so defined usable space.
Do not place samples outside this usable volume.
Do not load this volume more than half to enable sufficient air flow inside the chamber.
Do not separate the usable volume into different parts with large area samples.

12.2 Electrical connection data CUL-Version

(Units for USA and Canada)

ELECTRICAL CONNECTION DATA BD

Volume	**53**	**115**	**240**	**400**	**720**
Tension	115 V	115 V	115 V	115 V	115 V
Frequency:	60 Hz	60 Hz	60Hz	60 Hz	60 Hz
Nominal power:	0,30 kW	0,40 kW	0,68 kW	0,85 kW	1,25 kW
Nominal current:	2,6 A	3,5 A	5,9 A	7,4 A	10,9 A

ELECTRICAL CONNECTION DATA ED

Volume	**53**	**115**	**240**	**400**	**720**
Tension	115 V	115 V	208V 3N	208 V 3N	208V 3N
Frequency:	60 Hz	60 Hz	60Hz	60 Hz	60 Hz
Nominal power:	1,20 kW	1,60 kW	2,70 kW	3,40 kW	5,00 kW
Nominal current:	10,5 A	14,0 A	11,2 A	10,6 A	15,6 A

ELECTRICAL CONNECTION DATA FD

Volume	**53**	**115**	**240**
Tension	115 V	115 V	208V 3N
Frequency:	60 Hz	60 Hz	60Hz
Nominal power:	1,20 kW	1,60 kW	2,70 kW
Nominal current:	10,5 A	14,0 A	11,2 A

Installation category acc. to IEC 1010-1: II
Pollution degree acc. to IEC 1010-1: 2

12.3 Technical data APT.Line series BD

		BD 53	BD 115	BD 240	BD400	BD720
Exterior dimensions						
Width	mm	634	834	1034	1234	1234
Height (inclusive feet/castors)	mm	617	702	822	1030	1530
Depth	mm	575	645	745	765	865
incl. door handle, I-panel and exhaust duct	mm	85	85	85	85	85
Wall clearance rear	mm	100	100	100	100	100
Wall clearance side	mm	160	160	160	160	160
Steam space volume	l	70	142	283	457	808
Interior dimensions						
Width	mm	400	600	800	1000	1000
Height	mm	400	480	600	800	1200
Depth	mm	330	400	500	500	600
Interior volume	l	53	115	240	400	720
Number of shelves	standard / max.	2/4	2/5	2/7	2/10	1/16
Load per shelf	kg	15	20	30	35	45
Permitted total load	kg	40	50	70	90	120
Weight (empty)	kg	43	64	104	145	180
Temperature data						
Temperature range, 5°C above ambient up to	°C	99,9	99,9	99,9	99,9	99,9
Temperature variation at 37°C	± °C	0,5	0,4	0,5	0,5	0,5
at 50°C	± °C	1,1	0,8	0,9	0,9	0,8
Temperature fluctuation at 37°C	± °C	0,1	0,1	0,1	0,1	0,1
Heating up time [2)] at 37°C	Min	36	90	98	105	47
Recovery time after door was opened 30 sec [2] at 37°C	Min	5	6	5	6	16
at 50°C	Min	7	7	6	29	16
IP-System of protection acc. To EN 60529	IP	20	20	20	20	20
Nominal voltage (±10 %) 50/60 Hz	V	230	230	230	230	230
Nominal power	W	400	400	680	850	1250
Energy consumption at 37°C	W	11	20	33	56	80
Installation category acc. to IEC 1010-1		II	II	II	II	II
Pollution degree acc. to IEC 1010-1		2	2	2	2	2
Number of doors	standard/max.	1	1	2	2	2
Equipment						
Microprocessor temperature controller with LED-display		●	●	●	●	●
Temperature safety device cl. 3.1 acc. to DIN 12880, part 1		●	●	●	●	●
Inner glass door		●	●	●	●	●
Exhaust duct ø 50 mm with ventilation flap and ventilation slide		●	●	●	●	●
Castors with brakes (4 pieces)		-	-	-	-	●
Options/Accessories						
Shelves chrome-plated or stainless steel		❍	❍	❍	❍	❍
Temperature safety device cl. 3.3 acc. to DIN 12880, part 1		❍	❍	❍	❍	❍
Lockable door		❍	❍	❍	❍	❍
Measurement and protocol acc. to DIN 12880, part 2		❍	❍	❍	❍	❍
Waterproof interior socket		❍	❍	❍	❍	❍

12.4 Technical data APT.Line series ED

		ED 53	ED 115	ED 240	ED400	ED720
Exterior dimensions						
Width	mm	634	834	1034	1234	1234
Height (inclusive feet/castors)	mm	617	702	822	1030	1530
Depth	mm	575	645	745	765	865
incl. door handle, I-panel and exhaust duct	mm	85	85	85	85	85
Wall clearance rear	mm	100	100	100	100	100
Wall clearance side	mm	160	160	160	160	160
Exhaust duct	outer– ∅ mm	52	52	52	52	52
Steam space volume	l	70	142	283	457	808
Interior dimensions						
Width	mm	400	600	800	1000	1000
Height	mm	400	480	600	800	1200
Depth	mm	330	400	500	500	600
Interior volume	l	53	115	240	400	720
Number of shelves, chrome-plated	standard/max	2/5	2/6	2/7	2/10	2/16
Load per shelf	kg	15	20	30	35	45
Permitted total load	kg	40	50	70	90	120
Weight of the unit (empty)	kg	41	60	96	140	174
Temperature data						
Temperature range, 5°C above ambient up to	°C	300	300	300	300	300
Temperature variation [1] at 70°C	± °C	2	1,5	1,5	1,7	1,5
at 150°C	± °C	3,2	2,5	2,5	3	2,8
at 300°C	± °C	4,5	4,5	5,0	5,0	5,0
Temperature fluctuation	≤± °C	0,4	0,4	0,4	0,4	0,4
Heating-up time [2] to 70°C	min	14	15	15	20	20
to 150 °C	min	27	29	30	43	43
to 250°C	min	61	66	61	90	100
Recov. time after door was opened for 30 sec. [2] at 70°C	min	2	2	7	4	4
at 150°C	min	7	10	16	20	24
at 300°C	min	10	15	22	24	26
Air change at 70°C	X/h	8	12	11	11	10
at 150°C	X/h	19	10	10	10	9
at 300°C	X/h	20	10	9	9	8
IP-System of protection acc. to EN 60529	IP	20	20	20	20	20
Nominal voltage (±10 %) 50/60 Hz	V	230	230	230	400 3/N	400 3/N
Nominal power	W	1200	1600	2700	3400	5000
Energy consumption at 70°C	W	56	90	143	201	220
at 150 °C	W	188	300	447	672	750
at 300 °C	W	320	360	700	1000	1200
Installation category acc. to IEC 1010-1		II	II	II	II	II
Pollution degree acc. to IEC 1010-1		2	2	2	2	2
Number of doors	standard/max.	1	1	2	2	2
Equipment						
Microprocessor temperature controller with LED-display		●	●	●	●	●
Timer 0 – 24 h		●	●	●	●	●
Safety device class 2 acc. to DIN 12880, Part 1		●	●	●	●	●
Exhaust duct ø 50 mm		●	●	●	●	●
Adjustable ventilation slide		●	●	●	●	●
Lockable castors (4 pieces)		–	–	–	–	●

	ED 53	ED 115	ED 240	ED400	ED720
Options / Accessories					
Shelves, chrome-plated resp. stainless steel	O	O	O	O	O
Safety device cl. 3.1 acc. to DIN 12880, Part 1	O	O	O	O	O
Door with window and interior lighting	O	O	O	O	O
Lockable door	O	O	O	O	O
Viton gasket (temperature resistant up to 220° C max.)	O	O	O	O	O
Closable access ports	O	O	O	O	O
Program timer with day or week program mechanical/digital	O	O	O	O	O
Measuring protocol acc. to DIN 12880, Part 2	O	O	O	O	O
Calibration certificate	O	O	O	O	O

12.5 Technical data APT.Line series FD

			FD53	FD115	FD240
Exterior dimensions					
Width		mm	634	834	1034
Height (inclusive feet/castors)		mm	617	702	822
Depth		mm	575	645	745
incl. door handle, I-panel and exhaust duct		mm	105	105	105
Wall clearance rear		mm	100	100	100
Wall clearance side		mm	160	160	160
Exhaust duct		outer– ∅ mm	52	52	52
Steam space volume		l	77	158	308
Interior dimensions					
Width		mm	400	600	800
Height		mm	400	480	600
Depth		mm	330	400	500
Interior volume		l	53	115	240
Number of shelves, chrome-plated		standard/max.	2/5	2/6	2/7
Load per shelf		kg	15	20	30
Permitted total load		kg	40	50	70
Weight of the unit (empty)		kg	46	62	98
Temperature data					
Temperature range, 5°C above ambient up to °C		°C	300	300	300
Temperature variation [1]	at 70°C	± °C	0,8	0,7	0,8
	at 150°C	± °C	2	1,8	2
	at 300°C	± °C	3,7	3,9	4
Temperature fluctuation		≤± °C	0,4	0,4	0,4
Heating-up time [2]	to 70°C	Min	6	7	12
	to 150 °C	Min	24	30	27
	to 250°C	Min	45	49	50
Recov. time after door was opened for 30 sec. [2]	at 70°C	Min	2	2	2
	at 150°C	Min	5	8	10
	at 300°C	Min	10	15	16
Air change	at 70°C	x/h	59	29	19
	at 150°C	x/h	64	32	20
	at 300°C	x/h	53	26	18

		FD53	FD115	FD240
IP-System of protection acc. to EN 60529	IP	20	20	20
Nominal voltage (+10 %) 50/60 Hz	V	230	230	230
Nominal power	W	1200	1600	2700
Energy consumption at 70°C	W	145	230	370
at 150°C	W	300	544	850
at 300 °C	W	720	1100	1400
Installation category acc. to IEC 1010-1		II	II	II
Pollution degree acc. to IEC 1010-1		2	2	2
Number of doors	standard/max.	1	1	2
Equipment				
Microprocessor temperature controller with LED-display		●	●	●
Timer 0 – 24 h		●	●	●
Safety device cl. 2 acc. to DIN 12880, Part 1		●	●	●
Exhaust duct ø 50 mm		●	●	●
Adjustable ventilation slide		●	●	●
Options / Accessories				
Shelves, chrome-plated resp. stainless steel		○	○	○
Safety device cl. 3.1 acc. to DIN 12880, Part 1		○	○	○
Door with window and interior lighting		○	○	○
Lockable door		○	○	○
Viton gasket (temperature resistant up to 220° C max.)		○	○	○
Fresh air filter		○	○	○
Increased air change through stronger fan		○	○	○
Closable access ports		○	○	○
Program timer with day or week program mechanical/digital		○	○	○
Measuring protocol acc. to DIN 12880, Part 2		○	○	○
Calibration certificate		○	○	○

Legend :

- ● Standard equipment
- ❍ Optional
- \- Not available

1) value without outer glass window
2) up to 98 % of the set value

All of the technical data is the same for standard devices, operating in an area temperature of +22°C and with a main voltage fluctuation of ± 10%. The temperature data is according to DIN 12880, part 2 is established and oriented according to the recommended distance to the wall to 10% height, width and depth of the inner area. All of the data supplied represents the mean value for standard series production. Technical changes are reserved.

13. Declaration of harmlessness

Unbedenklichkeitsbescheinigung

Declaration regarding the safety and the sanitary harmlessness
Erklärung zur Sicherheit und gesundheitlichen Unbedenklichkeit

The safety and health of our collaborators, the regulation ” harmful material GefStofV ” and the regulations regarding working place security make it necessary that this form is completed for all products returned to us. Without presenting this completed form, we are not able to effect any repair.
Die Sicherheit und Gesundheit unserer Mitarbeiter, die Gefahrstoffverordnung GefStofV und die Vorschriften zur Sicherheit am Arbeitsplatz machen es erforderlich, dass dieses Formblatt für alle Produkte, die an uns zurückgeschickt wird. Ohne Vorliegen des vollständig ausgefüllten Formblattes ist eine Reparatur nicht möglich.

a) A completed copy of this form should be sent to us in advance by telefax (No ++49 (0) 7462/947398) or by post, so that we have the information at our disposal before the unit/part has arrived. Another copy should be sent together with the unit/part. Eventually the carrier should be informed.
Eine vollständig ausgefüllte Kopie dieses Formblattes soll per Telefax (Nr. ++49 (0) 7462/ 947398) oder Brief vorab an uns gesandt werden, so dass die Information vorliegt, bevor das Gerät/Bauteil eintrifft. Eine weitere Kopie soll dem Gerät/Bauteil beigefügt sein. Ggf. ist ach die Spedition zu informieren.

b) Incomplete indications or non – compliance with this process will lead to considerable delays. We would like to ask for your comprehension for measures which are beyond our influence and please help us to expedite the procedure.
Unvollständige Angaben oder Nichteinhalten dieses Ablaufs führen zwangsläufig zu beträchtlichen Verzögerungen in der Abwicklung. Bitte haben Sie Verständnis für Maßnahmen, die außerhalb unserer Einflussmöglichkeiten liegen und helfen Sie mit, den Ablauf beschleunigen.

c) Please fill in completely!
Bitte unbedingt vollständig ausfüllen!

1. Unit/part-type: / Gerät/Bauteil – Typ:
2. Serial – No./ Serien – Nr.:
3. Details about the substances / biological materials used / Einzelheiten über die eingesetzten Substanzen/biologische Materialien:
3.1 Designation / Bezeichnungen: a) ..... b) ..... c) ..... d) .....

3.2 Precautions to follow when handling these materials / Vorsichtsmaßnahmen beim Umgang mit diesen Stoffen:

a) .....

b) .....

c) .....

d) .....

3.3 Measures in case of skin contact or release / Maßnahmen bei Personenkontakt oder Freisetzung:

a) .....

b) .....

c) .....

d) .....

3.4 Further important information or regulations to follow / Weitere zu beachtende und wichtige Informationen:

a) .....

b) .....

c) .....

d) .....

4. Declaration regarding the risk of these materials (please tick) / Erklärung zur Gefährlichkeit der Stoffe (bitte Zutreffendes ankreuzen) :

❑ **4.1 for non toxic, non radioactive, biologically non dangerous materials** / für nicht giftige, nicht radioaktive, biologisch ungefährliche Stoffe:

We assure, that the above – mentioned unit/part:./ Wir versichern, dass o.g. Gerät/Bauteil...

❑ does not contain any toxic or other dangerous materials / weder giftige noch sonstige gefährliche Stoffe enthält

❑ that eventual reaction products are neither toxic nor represent any risk / auch evtl. entstandene Reaktionsprodukte weder giftig sind noch sonst eine Gefährdung darstellen

❑ eventual residues of dangerous materials were removed / evtl. Rückstände von Gefahrstoffen entfernt wurden.

❑ **4.2 for toxic, radioactive, biologically risky resp. dangerous materials or other dangerous materials** / für giftige, radioaktive, biologisch bedenkliche bzw. gefährliche Stoffe oder anderweitig gefährliche Stoffe.

❑ We assure, that the dangerous materials with which the above-mentioned unit/part was in contact, are mentioned in 3.1 and that all indications are complete / Wir versichern, dass die gefährlichen Stoffe, die mit dem o.g. Gerät/Bauteil in Kontakt kamen, in 3.1 aufgelistet sind und alle Angaben vollständig sind.

5. Kind of transport/forwarding agent / Transportweg/Spediteur:

Transport by (means and name of forwarding agent, etc.) Versendung durch (Name Spediteur o.ä.)

.....

Date of shipment to BINDER GmbH / Tag der Absendung an BINDER GmbH:

.....

We declare, that the following measures have been taken / Wir erklären, dass folgende Maßnahmen getroffen wurden:

- ❑ the unit/part was cleaned from dangerous materials, so that there will be no risk for the corresponding persons upon handling/repairing / das Gerät/Bauteil wurde von Gefahrstoffen befreit, so dass bei Handhabung/Reparaturen für die betreffenden Person keinerlei Gefährdung besteht
- ❑ the unit was carefully packed and completely marked / das Gerät wurde sicher verpackt und vollständig gekennzeichnet.
- ❑ the forwarding agent has been informed – if regulations require – about any risk relatingto the shipment / der Spediteur wurde (falls vorgeschrieben) über die Gefährlichkeit der Sendung informiert.

We assure, that we will be liable for any damage cause to BINDER GmbH by any incomplete of incorrect indications and that we indemnify BINDER against eventual claims by a third party. / Wir versichern, dass wir gegenüber BINDER für jeden Schaden, der durch unvollständige und unrichtige Angaben entsteht, haften und BINDER gegen eventuell entstehende Schadenansprüche Dritter freistellen

We have been informed, that according to German law (§ 823 BGB) we are directly liable to any third party – including BINDER's staff, especially occupied with handling/repairing the unit/part. / Es ist uns bekannt, dass wir gegenüber Dritten – hier insbesondere mit der Handhabung/Reparatur des Geräts/des Bauteils betraute Mitarbeiter der Firma BINDER - gemäß §823 BGB direkt haften

Name: .....

Position: .....

Date / Datum: .....

Signature / Unterschrift: .....

Company's seal / Firmenstempel:

The declaration of harmlessness must be filled in and enclosed to the appliance when sending it back to the factory for repair. In case the service or maintenance works are carried out locally this declaration must be handed over to the service engineer prior to work. Without this declaration no service or maintenance works can be carried out.