# Operating Manual

## APT.Line KB
## Cooled incubators

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## 1. Unpacking and check

After having unpacked the oven and accessories, please check, whether the consignment is complete and whether there are transport damages. In the latter case, please inform immediately your forwarding agent.

## 2. Introduction

WTB Binder Cooled Incuators series KB APT.Line have been carefully manufactured and developed by means of modern production facilities.

The cooled incubator is equipped with a multifunctional microprocessor-PID-controller with digital display (accurate to a tenth of a degree) and is subject to strict checking. Nevertheless, should you have reasons for complaint, please get in contact with your retailer.

The inner chamber as well as the preheating chamber and the inside face of the door are made of stainless steel (No. 1.4301). The housing is powder-coated with paint RAL 7035 and completely painted everywhere.

The model KB 720 is equipped with four wheels which may be locked.

## 3. Information for the user

Location:
The temperature specificaitons refer to an ambient temperature of 20° C. The cooled incubator should have a distance of approx. 160 mm to other appliances as well as to the wall.

Units being equipped with wheels can be locked by means of brakes.

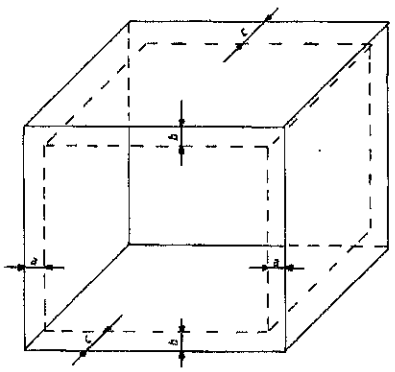
Charging:
If the cooled incubator is used to full capacity, differences between the actual and the specified heating-up rates/rates of cooling are possible, according to charging!

Cleaning of the unit:
The unit can be cleaned interiorly and exteriorly with normal, acid-free household cleaners. In the inner chamber also alcoholic solvents may be used.
For better cleaning of the inner chamber, the the inner chamber bottom and the right and left side part of the inner chamber can be dismounted.

Heating-up rate:
Approx. 1,1 up to1,6° C/min. (on average)

Cooling-down rate:
(Compressor switched on) approx. 0,5 up to 1,4° C/min. (on average)

Usable space
Recommended working area at different temperature observing the temperature the temperature precision.



10% specifications referred to height, width, depth.

**Attention!**

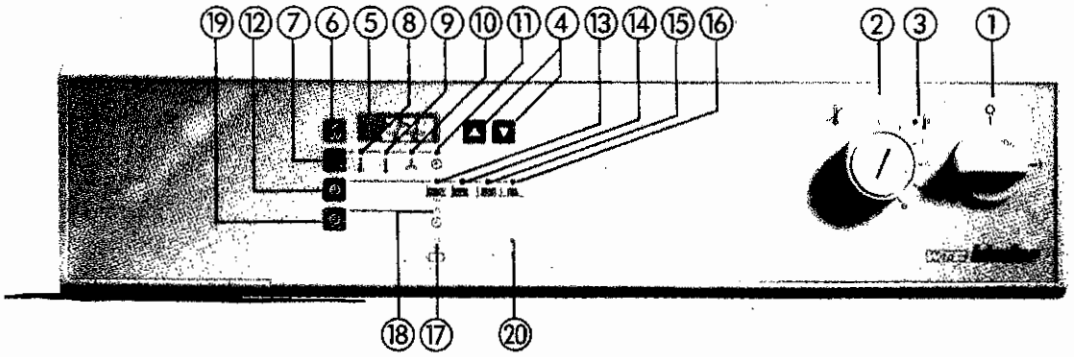
The cooled incubators may not be charged with inflammable and explosive substances. They are constructed according to the relevant VDE regulations and each unit is checked according to VDE 0113.

The cooled incubator series APT.Line knows the following operating modes:

a) Continuous operating mode in the cold/heat range
b) Timer mode in the cold/heat range
c) Delayed on/off, etc.

# 4. Control panel

## Operation of controller RD 2.1




| | |
|---|---|
| 1 | Main switch /on/off) |
| 2 | Safety device class 3.1 |
| 3 | Pilot lamp red |
| 4 | Up/down button |
| 5 | Digital display |
| 6 | Button for actual value and set point |
| 7 | Mode button (control key ) |
| 8 | Set luminous diode first set point |
| 9 | Set luminous diode secont set point (option) |
| 10 | Set luminous diode fan speed |
| 11 | Set luminous diode timer |
| 12 | Control key timer mode |
| 13 | Luminous diode continuous operating mode |
| 14 | Luminous diode timer mode delayed off |
| 15 | Luminous diode timer mode delayed on |
| 16 | Luminous diode temperature-dependent delayed off (if xd < 1K ) |
| 17 | Luminous diode heating active |
| 18 | Luminous diode timer mode |
| 19 | Button start/stop |
| 20 | Luminous diode green, ready for service |

## 5. Putting into operation

Check the main supply, see electrical data on the label of appliance.

Set on/off switch (1) to position I, green luminous diode (20) indicates that the unit is ready for operation.
The display shows the actual value and the timer mode set last.

**1) Set first set point**

Press mode button (7), luminous diode (8) lights up. Set desired set point with up/down button (4).

**Attention**
If the buttons are not pressed within 10 seconds, the display switches over automatically to the present actual value.

**2) Set second set point (option):**

(Only in combination with temperature cycle device and additional digital week program timer).
Press mode button (7) until luminous diode (9) lights up and the secont set point can the be set by pressing the buttons (4).

**3) Adjust fan speed:**

Press mode button (7) until luminous diode (10) lights up. Use buttons (4) to adjust the speed of the fan motor in steps of ten between 0° and 100%.

**4) Choose timer mode:** (Continuous operating mode, delayed on/off, temperature-dependent delayed off, see §5)

Press mode button (7) until luminous diode (11) lights up. Choose the desired timer mode with button (12). Use up/dows buttons (4) to set the desired time in hours and minutes.

**5) Display timer mode:**

The luminous diode (18) indicates the state of timer mode. If the luminous timer mode. If the luminous diode flashes, the controller waits. If the luminous diode constantly lights up, the controller heats up and adjusts to the set set point.

There are the following possibilities:
The time can be adjusted between 0-99 h and 59 min.

**In Biolab II work, a few tips to get microbial growth started at the right time:**

**1. Cool the cabinet in good time to eg + 5 ° C.**

**2. After inoculating the growth tubes, place them in a cabinet (and allow the cabinet to cool back to + 5 C)**

**3. Set the desired growth temperature, eg 30 C (Mode, first menu)** (button 8)

**4. Set the residence time after which the growth temperature turns on.** (Mode, 4th menu, button 11)

**5. Set the clock menu that describes the delay**

**6. Press the Start / Stop clock image to start the timer (the clock image LED flashes in standby mode and stays on when it is turned on)**

**a) Continuous operation mode:**
The set point is maintained interminably long. (Set timer mode to 0.00 - see §4).

**b) Delayed off:**
After lapse of time set, the heating, fan motor and compressor are switched off.

**c) Delayed on:**
After lapse of time set, the heating, fan motor and compressor are switched off.

**d) Temperature-dependent delayed off** (if xd 1° C):
The time set will only begin to expire, if the actual value is 1° C of the set point.

**6) Input temperature ramp (1-10° C)**

Press mode button (7) for longer than 5 seconds, after which the gradient of the set point, which then can be adjusted between 1° C up to 10° C per minute by means of mode button (4) (OFF - 100% heating capacity).

**Please note:** The maximum heating rate is approx. 2° C /min!

**7) Input heating capacity (0 - 100%):**

Press mode button (7) for longer than 5 seconds, after which the gradient appears in the display (5). If mode button (7) is pressed again, the heating capacity is indicated. The heating capacity can be adjusted from 0% up to 100% by means of mode button (4).

**8) Adjustment of print time via keyboard**

Input print time intervals (1-250 min). Press mode button for longer than 5 seconds, after which the gradient appears in the display (5). If mode button is pressed again, the heating capacity is indicated. After pressing again, the display shows „P" (Print Time).
Use button (4) to set the print time intervals. After approx. 10 seconds the controller switches over to the standard display.

**Printer interface RS 232C**

Connection cable printer interface for printing may not be longer than max. 2m, otherwise a connection cable with screening on both sides must be used.
Baudrate 9.600, Databits 8, 1 Stopbit, no parity.

**9) Pressing the button actual value/set point (6),** the display switches over to the basic position, i. e. to the actual value display.

**10) Start/stop of the controller:**

After having set all parameters, the controller, as well as the timer mode are started or stopped via button (19).

**11) Display „heating active“:**

The luminous diode (17) indicates „heating active“. If the luminous diode (17) flashes, the set set point is adjusted.

## 6. Safety device (TWW)

**as control function if temperature is exceeded**

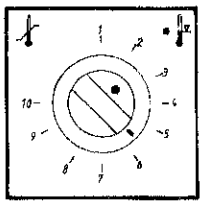
**Safety device class 3.1:**

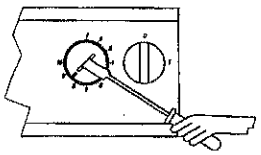
Protection of the cooled incubator, ist environment and load against inadmissible exceeding of the temperature.

**Attention!**
**Only allowed for non-dangerous loads**
(please see also directives for laboratories ZH 1/119).

**Function:**

The safety device is independent in function and electricity of the temperature control device and takes over the control in case of failure.





Setting the knob to the end, the safety device is used as protection of the oven. If, however, the safety device is set somewhat higher than the temperature cosen at the controller, the safety device serves as protection of the load.

If the safety device took over the control (red pilot lamp lights up), the following has to be done:

- disconnect the unit from the electrical supply
- the reason for the fault has to be found out and removed by a specialist
- again switch on the cooled incubator as described

**Setting:**

In order to check at which temperature the safety device switches on and in order to set it exactly, the cooled incubator has to be put into operation. Use a screwdriver to set the knob to the end (protection of the cooledi ncubator). When the pre-set set point has been reached, the safety device has to be put back to the switch point. If the safety device then starts working, the red pilot lamp lights up.

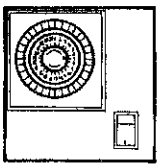
The optimal setting of the safety device is achieved by turning the knob back by afpprox. 1 scale line. The red pilot lamp stops lighting up.
The graduation on the scale from 1 to 10 corresponds to the temperature range from 5° C above ambient temperature up to 100° C.

Operation check:

The safety device has to be checked regularly regarding the functionning. We recommend to have this check also carried out by the authorized service staff, e. g. before starting a longer process.

## 7. Program timer with day program

**Function:**
For switching on/off of the heating, fan motor and compressor.



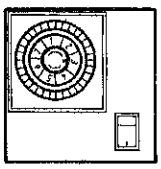
**Setting:**

When starting operation set actual time of day on the program disk by the turning to the right.
Choose desired switching times by catching the shiftable stops. The catched segments of the scale indicate the switching on time. Minimum switching frequency: 15 minutes.
If the switch is set to position „0", the unit operates in timer mode.

**Attention:**
The multifunctional timer is to be set to continuous operation mode.

## 8. Program timer with week program

**Function:**
For switching on/off of the heating, fan motor and compressor.

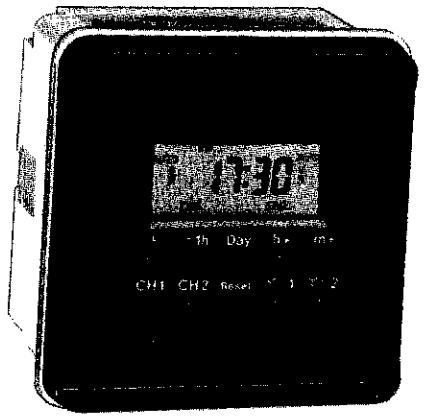


**Setting:**

Set actual time of day and days of the week on the program disk by turning to the right.
Choose desired switching times by catching the shiftable stops. Minimum switching frequency: 2 hours
If the switch is set to position „0", the unit operates in timer mode and the multifunctional timer is out of action.

**Attention:**
The multifunctional timer is to be set to continuous operation mode.

## 9. Temperature cycle device (option)



Those cooled incubators being equipped with a temperature cycle device offer the possibility to switch over between two set points by using a digital program timer with week program.

Switching over between two set points
- Switch on the cooled incubator
- Set switch of digital program timer with week program to position I
- Input the two desired set points at the controller (see putting into operation)
- Program timer with week program to the desired change-over times on channel 1 according to operating instruction
- Switching contact „0" (off) corresponds to the first set point and switching contact „1" (on) to the second set point
- In case of temperature cycle in the cold or cold/heat range, the compressor must be switched on via switch (21).
- If the switch of the digital program timer with week program is set to „0", the temperature cycle is out of action and only the first set point is working.

Use a pencil or similar to briefly operate hey „Reset". „OFF 00:00" appears in the display. The timer is now operating.

**Setting day and time**

1. Keep key pressed during the total duration of this setting operation.
2. Use key „Day" to set the actual day of the week.
3. Now use key ± 1h to advance time by 1 hour in the case of summer time (plus 1 hour ). The display shows symbol +1h and 01:00 (flashing dots).
4. Setting of actual time is achieved by additional operation of keys h+ and m+ (h = hour, m = minute).
5. After having set the actual time and day of the week, release key..... After a few seconds, a flashing colon will appear in the display.

**Attention!**
If keys h+ or mk+ are kept pressed for more than 2 seconds, a rapid advance of figures will result.

**Programming of switching times:**

For 2 switching channels - independent circuits can be switched - 8 switching-on and 8 switching-off times each (2x16=32 storage spaces) are available.
For the programming of the switching-on and switching-off commands resp., it is necessary to press either key „CH1" or „CH2" first. The display shows „CH1 or CH2 --:--". Now use keys h+ and m+ to set the exact switching on time and operate key „DAY" to establish the day on which the command is to be executed. Following this setting operation, again briefly operate key „CH1" or „CH2" resp. (acc. to inital choice), in order to transfer the switching-on command into the storage compartment. Symbol „CH1 or CH2 resp. OFF --:--" appears. As in the case of the switching-on time, proceed now to program the corresponding switching-off time via key h+, m+ and „DAY". Following this operation, again briefly press key „CH1" and „CH2" resp., the switching-off time is stored. The display now shows „CH1" or „CH2" resp. „ON --:--).
If further switching-on and switching-off times are to be added, keys „CH1" and „CH2" resp. are to be operated repeatedly to call up the next free storage space (--:--).

**Multiple day switching groups**
It is possible to combine switching commands within the switching time program if they are to be executed at the same time on different days of the week. For this purpose your unit offers the following possibilites:

| | |
|---|---|
| Constant daily repetition: | Monday - Sunday (Mo - Su) |
| Weekdays only: | Monday - Friday (Mu - Fr) |
| Weekend only: | Saturday - Sunday (SA - Su) |

These weekday cominations can be called up with key „DAY" (e.g.Mo , Tu, We, Th, Fr) during the programming operation of switching times.

Thus the switching time carried out for instance Monday - Friday at 13.00 h requires only one storage space.

**Actual switching condition**

Following the programming of the time and switching times, the time switch automatically establishes the switching condition, which - acc. to program - corresponds to the „actual position".
If the switch is set to position „0", the unit opertes on timer mode and the multifuntional display is out of action.

**Attention!**

The multifunctional timer is to be set to continuous operation mode. In the c ase of the digital program timer with week program, only the switching channel „CH1" is occupied.

## 10. Special notes concerning low temperature operation

In case of operation below the ambient temprature, the cooling machine has to be switched on and the desired set point is set as described in §5.

**Attention:** Constant working with switched on cooling at a working temperature of more than +50° C can considerably shorten the durability of the cooling set.

**Defrosting**

WTB Binder Cooled Incubators are very impermeable to diffusion concerning construction. Because of the detrimental effects on the temperature precision, the units are not equipped with an automatic cyclic defrosting device. Nevertheless, the humidity in the air condeses on the evaporator.

The more often the door is opened, the larger the quantity of humidity covery the evaporator with ice will be.
**Therefore, always keep the door closed!**

Two cases have to be distinguished:
At temperatures above +%° C the coating of ice will be automatically and continuously melt off by the air.

At lower temperature, the evaporators will be covered with ice. In this case, the unit should be defrosted from time to time, e. g. when the cooled incubator is just empty. For this purpose, open the door and switch off the cooling machine. Set temperature to 30-40° C for a period of 15-30 min., after which the unit will be defrosted.

A shortage of the cooling capacity is the result of a icy evaporator.

## 10.1 Dimensions and weights

| **Type** | **Inner chamber** (w x h x d mm) | **Housing** (w x h x d mm) | **Weight** kg net |
|---|---|---|---|
| KB 53 | 400 x 400 x 330 | 634 x 778 x 575 | 72 |
| KB 115 | 600 x 480 x 400 | 834 x 858 x 645 | 97 |
| KB 240 | 800 x 600 x 500 | 1034 x 978x 745 | 151 |
| KB 720 | 1000 x 1200 x 600 | 1234 x 1686 x 865 (incl. Rollen) | 268 |

## 10.2 Shelves, loadings and connected loads

| **Type** | **Shelves** max. | **Loadings** total | **Connected loads** |
|---|---|---|---|
| KB 53 | 2/4 | 15/40 kg | 600 W, 230 V 50Hz, +/- 10% 1/N |
| KB 115 | 2/5 | 20/50 kg | 650 W, 230 V 50Hz, +/- 10% 1/N |
| KB 240 | 2/7 | 30/70 kg | 930 W, 230 V 50Hz, +/- 10% 1/N |
| KB 720 | 2/16 | 45/120 kg | 1200 W, 230 V 50Hz, +/- 10% 1/N |

## 11. Warranty

We guarantee for faultless operation of this cooled incubator, provided that it is treated properly and connected acc. to the directives of this operation manual.

The warranty period is **18 months** as from date of delivery.

In case of complaints, the warranty is restricted to subsequent mending resp. repair free of charge or delivery of a new unit, being however our decision.
Defective parts will be repaired or replaced free of charge, provided that the proof is delivered that a failure or defect traces back to defects of material or manufacture.

In case of return, the cooled incubator must be packed into the original or an equivalent packing.

Further claims for damages are excluded!

**Important note**

Repairs may only be carried out by specialists being authorized by WTB Binder Labortechnik GmbH. Repaired units must correspond to the quality standard being pre-set by WTB Binder Labortechnik GmbH.