

# User Manual Incucenter IC40, 80, 160, 240, 400

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**Important Information****Quick Information for Service**

Please fill out all necessary information for your Incucenter.  
It helps you when you contact your Dealer or Service department.

SERIAL NUMBER:	
PHONE NUMBER SERVICE	
PURCHASE DATE	
SOFTWARE VERSION (See Display on Power ON)	

Notes:

## Introduction

### Overview

The INCUCENTER is an Incubator with forced air and an intelligent control of fan-speed in a range between 0-100%. The control of ramping functions allows fast and accurate heating up procedure and therefore more applications available to users

Microprocessor-controller with enhanced Fuzzy-Logic - Allows precise ramping of temperature as well as an excellent reproduction of temperature distribution in the chamber.

Special Insulation - Less heat loss. Saves energy and costs. Ambient temperature of housing surface

Robust Swiss quality design – Made even for scientific applications

Work Chambers are of stainless steel and are provided with fully adjustable chromium plated rod shelves.

The chambers have well radiused corners for easy cleaning.

Exterior is of textured powder coated mild steel.

### Applications

The INCUCENTER is an extremely versatile incubator. It can be used Research & Development, Quality Control as well industrial applications. Some examples: Drying and sterilization applications in scientific as well as industrial usage suit well for this oven. A must when precise temperature distribution and a high accuracy are needed

**Note: The Incucenter incubators are not built to use substances which are explosible or let free explosible gases during the incubation process.**

### Controller

Fuzzy-Logic microprocessor controller with digital alphanumeric LCD-Display, real time clock, variable fan speed and temperature ramp.

Intelligent Fan-Speed control IntelliFan - Wide range of temperature ramping functions. More user application. In combination with Fuzzy-logic gives you an excellent stability of temperature distribution and accuracy of programmed ramp.

Brilliant LCD Display for user-dialog and easy to operate keypad for fast programming and operating.

User dialog with controller is displaying your local language. Up to five languages can be selected.

Easy to operate and programming with EasyMenu

It allows the storage of 50 programs and 15 program steps (a step = a ramp, a temperature, a fan-speed and a dwell time = Hold Time). The programs remain stored in memory even without external power (battery buffered).

Holding Time (dwell time) 0 - 999h 59m

The real time clock allows a process to be started at any time – i.e.: on January 6, 2002 at 5 30 in the morning.

RS-232 interface. All data can be protocolled with a printer or computer. Remote controlling and programming, Door-Switch - switch-off heater/fan by opening door

### Safety

DIN 12880 class 3.1 In case of over-temperature, a built in safety controller as a back-up circuit takes over the control of the heating and will shutdown the oven.

There is also an additional mechanical over-temperature device which shuts down the oven

High quality accurate PT 100 temperature sensors.

Superior "Swiss Made" manufacturing quality according ISO9001

## Getting Started

### Parts delivered

Your System will be delivered with following Parts:

- 1 Incucenter Unit
- 2 Shelves
- 1 Power Cord
- 1 User Manual

### Install requirements

Ensure that following conditions are met before you install the system.

Electric power connection as per type plate on inside of the door must meet your power connector.

For 230 V, 50/60 Hz min

For 115 V, 50/60 Hz min

The ambient temperature is min. +5° C ... max. 35° C (+40° F ... 95° F)

Leave at least 10cm space between system and walls or benches.

### Installing System

The System comes with two shelves. Place shelf in appropriate position.

Plug cord

Close door.

Switch power on

Display shows current Firmware Version see Power On Sequence

To start oven or program it see Chapter Operating Menus

### Cleaning System

To clean the system use mild detergents. No Acid or similar detergents should be used.

## System Components

- 1 Controller
- 2 Door Handle
- 3 RS232 Connector (rear)
- 4 Fan
- 5 Door Lock
- 6 Shelf



## Controller



To control the system the controller has few “easy to use” buttons on a foil keypad. Simply press desired button.

All information is displayed on a Liquid Crystal Display (LCD) with backlit. LED Indicators for status of Power, Heat and Program are used to indicate the main process status.

Buzzer (not visible) is indicating audible Status or Alarm

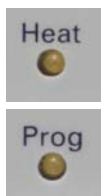
## Keypad & Display

### Buttons



▲	Up	You can scroll through the menu structure
▼	Down	You can scroll through the menu structure
↩	Enter	Confirm a menu selection, Confirm a value input or an answer choice
ESC	Escape	Cancel actual operation, Go back in Menu Structure, Quit actual state ....
+	Plus	Increase a value in flashing input fields , Select multiple Choices; Input Value must flash to make + button operable
-	Minus	Decrease a flashing value, Select multiple Choices; Input Value must flash to make + button operable
ON/OFF	Switch ON or OFF your System. When on LED is lit	

### LED Indicators



When **lit**: Heat Power is on

When **lit**: You are running a program

When **flashing**: A delayed start for program operation was entered.

## Operating

### How to interpret displays described in this manual...

#### Power ON Sequence



By pressing the power-on button, the display will show the software version. All standard, pre-setted or saved information will be loaded during this process. After a while display will show first Main Menu Point

#### Input Field



A input value which is underlayed with yellow(grey) background means this value is flashing on the real display.

#### Multiple Input Fields



If you reach a multiple input display first time, the first part (... of 3 in this example) of the input field is flashing to indicate input here.. Flashing input fields are changed with +/- keys

#### Multiple Choice Fields



In a multiple choice field the last actual setted (pre-set) option will flash. Change option with + or - and confirm with ↵

### Definitions of terms

#### What is a Set Temperature?

A Set Temperature is the target temperature you want operate the system with.

#### What is a Gradient?

A Gradient is the slope of the heating up process to the specific set temperature. It is indicated as °C / Minute. Negative Gradients are not allowed. The maximal value of a gradient is system depending and has a range and is pre-defined by factory. A system specific curve of gradient corridors see

#### What is a Fan Speed?

The Fan-Speed is a percentage of a range of rounds per minute. The minimal or maximal RPM Value is system depending. The % Value is based on this min/max range.

#### What is a Holding Time?

A timer is used to specify how long a set temperature has to be hold. The timer starts counting back when the set temperature is reached. The maximal time you can set is: 999 hours and 59 minutes. This equals a max time of 41 days 15 hours and 59 minutes

#### What is a Start Date/Time

If you are using a start date or time you will be able to set a future date/time to start the system with pre-setted parameters i.e. temperature, Gradient, Fan Speed, Timer

## Main Menu Overview

### General operation buttons

In general you can scroll through the menu points with the ▼ or ▲ button.  
Select the desired menu point with ↵

### 1 Temperature & Options

A screenshot of a monochrome LCD screen showing the text "Main Menu" on the first line and "Temp & Options" on the second line.

Manual operation with a set temperature. You can select options like gradient, hold-time (dwell-time), fan speed, pre-set start date/time.

Press ↵ to select ➔ 1.1

ESC returns to ➔ 1

### 2 Program

A screenshot of a monochrome LCD screen showing the text "Main Menu" on the first line and "Program" on the second line.

The menu Program is divided in menus for creating, editing, deleting and printing programs.

Press ↵ to select ➔ 2.1

ESC returns to ➔ 1

### 3 Configuration

A screenshot of a monochrome LCD screen showing the text "Main Menu" on the first line and "Configuration" on the second line.

This menu point allows you to configure the system

Press ↵ to select ➔ 3.1

ESC returns to ➔ 1

### 4 Service Mode

A screenshot of a monochrome LCD screen showing the text "Main Menu" on the first line and "Service Mode" on the second line.

This menu point is protected by an access-code and is available only for trained Service-Technicians.

Press ↵ to select ➔ 4.1

ESC returns to ➔ 1



## 1 Main Menu Temp & Options



Main Menu  
Temp & Options

Manual operation with a set temperature. You can select options like gradient, hold-time (dwell-time), fan speed, pre-set start date/time.

Press **↵** to select **➔ 1.1**

**ESC** returns to **➔ 1**

### 1.1 Set Temperature



Set Temperature  
120.0°C

+/- change desired value.

**↵** confirms and saves value **➔ 1.2**

**ESC** restores the old value or returns to **➔ 1**

### 1.2 Select Quick Start or Start with Options



Start ?  
Now Options

+/- Select desired answer

**↵** confirms and saves value

If **Now** selected: System will start immediately **➔ 6**

If **Option** selected **➔ 1.3**

**ESC** cancels and returns to **➔ 1**

### 1.3 Set Gradient



Gradient  
2.0°C/M

+/- Change value

**↵** confirms and saves the value **➔ 1.4**

**ESC** restores the old value or returns to **➔ 1**

**Note:** A value of **0,0** means maximal possible gradient value!

### 1.4 Set Holding Time (dwell time)



Hold Time  
HH:MM 105:00

+/- Change value

**↵** confirm value and skips to the next input field (HH **➔** MM) or stores the time and go to **➔ 1.5**

**ESC** restores the old value and skips back one input field (MM **➔** HH) or goes back to **➔ 1**

**Note:** A value of 0:00 means endless holding time

### 1.5 Set Fan Speed



Fan Speed  
100%

+/- Change value

**↵** confirms and saves the value **➔ 1.6**

**ESC** restores the old value or returns to **➔ 1**

**Note:** The minimal Fan Speed is depending on the system and is factory set.

### 1.6 Set Start-Date



+/- Change desired value

←confirm value and skips to the next input field (DD → MM, MM→YY) or stores the date and go to → 1.7

**ESC** restores the old value and skips back one input field (YY→MM, MM→ DD) or goes back to → 1

**Note:** The pre-set date is the actual date from the real-time clock.

### 1.7 Set Start Time



+/- Change desired value

←confirm value and skips to the next input field (HH → MM) or stores the time and go to :

If the Start Date and/or Start Time is in the **past**, the display will return back to → 1

If your Start Date and/or Start Time is in the **future** you will see the operating display → 5

**ESC** restores the old value and skips back one input field (MM→HH) or goes back to → 2.1

**Note:** The pre-set time is the actual time from the real-time clock.

## 2 Main Menu Program

A screenshot of a terminal window showing the text "Main Menu" on the first line and "Program" on the second line.

The menu Program is divided in menus for creating, editing, deleting and printing programs.

Press **↵** to select → **2.1**

**▼/▲** to scroll through the Main Menu

**ESC** return to → **1**

### 2.1 Menu Program - Start

A screenshot of a terminal window showing the text "Menu Program" on the first line and "Start" on the second line.

Start an existing program

**↵** confirm menu choice → **2.1.1**

**▼/▲** scroll through the Menu.

**ESC** return to → **2**

### 2.2 Menu Program - New

A screenshot of a terminal window showing the text "Menu Program" on the first line and "New" on the second line.

Create a new program

**↵** confirm menu choice → **2.2.1**

**▼/▲** scroll through the Menu.

**ESC** return to → **2**

### 2.3 Menu Program - Edit

A screenshot of a terminal window showing the text "Menu Program" on the first line and "Edit" on the second line.

Edit an existing program

**↵** confirm menu choice → **2.3.1**

**▼/▲** scroll through the Menu.

**ESC** return to → **2**

### 2.4 Menu Program - Delete

A screenshot of a terminal window showing the text "Menu Program" on the first line and "Delete" on the second line.

Delete an existing program

**↵** to select [Delete Program] → **2.4.1**

**▼/▲** scroll through the Menu.

**ESC** return to → **2**

### 2.5 Menu Program - Print

A screenshot of a terminal window showing the text "Menu Program" on the first line and "Print" on the second line.

Print a program

**↵** to select [Print Program] → **2.5.1**

**▼/▲** to scroll through the Menu.

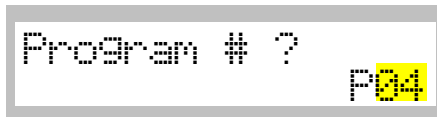
**ESC** return to → **2**

## 2.1 Menu Program Start



Start an existing program  
 ←confirm menu choice→ **2.1.1**  
 ▼/▲ scroll through the sub-menu.  
**ESC** returns to → **2**

### 2.1.1 Select Program #



+/- select desired program number  
 ←confirm value → **2.1.2**  
**ESC** returns to → **2.1**

**Note:** Only stored only program numbers with content will appear in the display. If no program exist a beep-message will displayed.

### 2.1.2 Choose type of program start



+/- select type of program start  
 ←accept choice  
 If **Now** selected: System starts immediately → **6**  
 If **Delayed** selected :→ **2.1.3**  
**ESC** returns to → **2.1**

### 2.1.3 Set Start Date



+/- Change desired value  
 ←confirm value and skips to the next input field (DD → MM, MM→YY) or stores the date and go to → **2.1.4**  
**ESC** restores the old value and skips back one input field (YY→MM, MM→ DD) or goes back to → **2.1**  
**Note:** The pre-set date is the actual date from the real-time clock.

### 2.1.4 Set Start Time



+/- Change desired value  
 ←confirm value and skips to the next input field (HH → MM) or stores the time and go to :  
 If the Start Date and/or Start Time is in the **past**, the display will return back to → **2.1.2**  
 If your Start Date and/or Start Time is in the **future** you will see the operating display → **7**  
**ESC** restores the old value and skips back one input field (MM→HH) or goes back to → **2.1**  
**Note:** The pre-set time is the actual time from the real-time clock.

## 2.2 Menu Program New

The storage capacity is 50 Programs with 15 Steps/Program. Each Step contains of a Set-Temperature, a Gradient, a Hold-Time and a Fan-Speed.

The sample here assumes creating a program #4 with 2 Steps



Create a new program  
 ⬅ confirm menu choice ➡ 2.2.1  
 ▼/▲ scroll through the Menu-Program.  
 ESC returns to ➡ 2

### 2.2.1 Create a new program



+/- select desired program number  
 ⬅ confirms the choice ➡ 2.2.2  
 ESC returns to ➡ 2.2

**Note:** Only free program numbers will appear in the display.

### 2.2.2 Set Temperature – Step 1



+/- change desired value. Pre-set value is the last used value in manual mode.  
 ⬅ confirm and saves ➡ 2.2.3  
 ESC restores the old value or returns to ➡ 2.2 and the step 1 as well as selected program number is not stored !

**Note:** Display 04/01 means actual program/step number.

### 2.2.3 Set Gradient – Step 1



+/- change desired value  
 ⬅ confirms the value ➡ 2.2.4  
 ESC restores the old value or returns to ➡ 2.2 and the step 1 as well as selected program number is not stored !

**Note:** A value of 0:0 means maximal gradient

### 2.2.4 Set holding time (dwell time) – Step 1



+/- Change desired value  
 ⬅ confirm value and skips to the next input field (HH ➡ MM) or stores the time and go to ➡ 2.2.5  
 ESC restores the old value and skips back one input field (M➡H) or goes back to ➡ 2.2 and the step 1 as well as selected program number is not stored !

**Note:** A value of 0:00 means endless holding time

### 2.2.5 Set Fan Speed – Step 1



+/- change desired value  
 ⬅ confirm value ➡ 2.2.6  
 ESC restores the old value or returns to ➡ 2.2

**Note:** The minimal Fan Speed is depending on the system and is factory set.

### 2.2.6 Choose if a additional step is required



+/- Select desired answer

↵accept

If **Yes** selected: step number will increment with 1 ➔ 2.2.7

If **No** selected: ➔ 2.2.12

### 2.2.7 Set Temperature – Step 2



+/- change desired value

↵confirm the value ➔ 2.2.8

**ESC** restores the old value or **if in step 2 and higher** returns to ➔ 2.2.6 but the actual step will not be saved !

**Note:** Display 04/02 means actual program/step number

### 2.2.8 Set Gradient – Step 2



+/- change desired value

↵confirm the value ➔ 2.2.9

**ESC** restores the old value or **if in step 2 and higher** returns to ➔ 2.2.6 but the actual step will not be saved !

### 2.2.9 Set Holding Time – Step 2



+/- Change desired value

↵confirm value and skips to the next input field (HH ➔ MM) or stores the time and go to ➔ 2.2.10

**ESC** restores the old value and skips back one input field (M ➔ H) or **if in step 2 and higher** returns to ➔ 2.2.6 but the actual step will not be saved !

**Note:** A value of 0:00 means endless holding time

### 2.2.10 Set Fan Speed - Step 2



+/- change desired value

↵confirm the value ➔ 2.2.11

**ESC** restores the old value or **if in step 2 and higher** returns to ➔ 2.2.6 but the actual step will not be saved !

### 2.2.11 Choose if a additional step is required



+/- Select desired answer

↵accept

If Yes selected: step number will increment with 1 ➔ 2.2.7

If No selected: ➔ 2.2.12

### 2.2.12 End of programming sequence



+/- Select desired answer

↵accept

If Yes selected: ➔ 2.2.13

If No selected: ➔ 2.2.11

### 2.2.13 Confirming & Saving the new program



Displays confirmation that the new program has been stored.  
After a few seconds the display will return to ➔ 2.2

## 2.3 Menu Program Edit

The example assumes to edit the program #4 with 2 steps



Edit an existing program  
 ←confirm menu choice → **2.3.1**  
 ▼/▲ scroll through the Menu.  
**ESC** returns to → **2**

### 2.3.1 Choose program to edit



+/- select desired value  
 ←confirms the value and skips to the next field (P→S) or → **2.3.2** (to the selected Step Number respective)  
**ESC** returns to → **2.3**

**Note:** Only used program and step numbers will appear in the display

### 2.3.2 Edit Temperature – Step 1



+/- change desired value. Pre-set value is the last used value in manual mode.  
 ←confirms and saves the value → **2.3.3**  
**ESC** restores the old value or returns to → **2.3**  
**Note:** Display 04/01 means actual program/step number.

### 2.3.3 Edit Gradient – Step 1



+/- change desired value  
 ←confirms and saves the value → **2.3.4**  
**ESC** restores the old value or returns to → **2.3**

### 2.3.4 Edit Holding Time – Step 1



+/- Change desired value  
 ←confirm value and skips to the next input field (HH → MM) or stores the time and go to → **2.3.5**  
**ESC** restores the old value and skips back one input field (M→H) or returns to → **2.3**

### 2.3.5 Edit Fan Speed – Step 1



+/- change desired value  
 ←confirms and saves the value → **2.3.6 (next step)**  
**ESC** restores the old value or returns to → **2.3**

### 2.3.6 Edit Temperature – Step 2



+/- change desired value. Pre-set value is the last used value in manual mode.  
 ←confirms and saves the value → **2.3.7**  
**ESC** restores the old value or returns to → **2.3**  
**Note:** Display 04/01 means actual program/step number.



**2.3.7 Edit Gradient – Step 2**


+/- change desired value

↵ confirms and saves the value → 2.3.8

ESC restores the old value or returns to → 2.3

**2.3.8 Edit Holding Time – Step 2**


+/- Change desired value

↵ confirm value and skips to the next input field (HH → MM) or stores the time and go to → 2.3.9

ESC restores the old value and skips back one input field (M → H) or returns to → 2.3

**2.3.9 Edit Fan Speed – Step 2**


+/- change desired value

↵ confirms and saves the value → 2.3.10 (next step)

ESC restores the old value or returns to → 2.3

**2.3.10 Decide if a new step must be added**


+/- Select desired answer

↵ accept

If Yes selected: step number will increment with 1 → 2.3.6If No selected: → 2.3.11**2.3.11 Confirm end of editing program**


+/- Select desired answer

↵ accept

If Yes selected: → 2.3.12If No selected: → 2.3.10**2.3.12 Save program display**



Displays confirmation that the new program has been stored. After a few seconds the display will return to → 2.3

## 2.4 Menu Program Delete



Delete an existing program  
 ←select menu → 2.4.1  
 ▼/▲ scroll through the menu.  
 ESC returns to → 2.4

### 2.4.1 Choose program # to be deleted



+/- select desired program number  
 ←accept → 2.3.2  
 ESC returns to → 2.4

**Note:** Only used program numbers will appear in the display

### 2.4.2 Deletion confirmation will be displayed



+/- Select desired answer  
 ←accept  
 If Yes selected: → 2.4.3  
 If No selected: → 2.4

### 2.4.3 Deletion confirmation will be displayed



Display confirms that the selected program has been deleted.  
 After a few seconds it will go to → 2.4

If you delete a program means you delete all steps associated to this program number. After deleting, the number is now available in the list of free program numbers.

## 2.5 Menu Program Print



Print a program  
 ←to select [Print Program] → 2.5.1  
 ▼/▲ to scroll through the Menu.  
 ESC return to → 2

### 2.5.1 Choose program # to be printed



+/- select desired program number  
 ←accept → 2.5.2  
 ESC return to → 2

**Note:** Only used program numbers will appear in the display

### 2.5.2 Displaying print in progress



Display confirms that the program has been printed. After a few seconds it will return to → 2.5

For an example of printout and printer connection refer section Printer Operation

### 3 Main Menu Configuration

Configuration of the system by the user



In this menu point you can define and set system options

Press **←** to select **→ 3.1**

**▼/▲** scroll through the menu.

#### 3.1 Select language



+/- Select the desired language

**←** confirm selection **→ 3.2**

##### Attention:

After confirmation the selection all subsequent dialogs are displayed in the selected language.

#### 3.2 Set actual date for internal real-time clock



+/- change value

**←** accept value and skips to the next input field ((DD **→** MM, MM **→** YY) or saves the date and goes to **→ 3.3**

**ESC** restores the old value and/or skips back one input-field (YY **→** MM, MM **→** DD)

#### 3.3 Set actual time for internal real-time clock



+/- change value

**←** accept value and skips to the next input field ((HH **→** MM) or saves the time and goes to **→ 3.4**

**ESC** restores the old value and/or skips back one input-field (MM **→** HH)

#### 3.4 Set allowed max Temperature



Set the maximal possible temperature value for manual operation.

+/- change value

**←** accept value **→ 3.5**

**ESC** restores value

#### 3.5 Set print interval for printer log via serial RS232 Interface



Set the Print Interval time. A value of 00:00 will disable printout of operating values.

+/- change value

**←** accept value and skips to the next input field ((HH **→** MM) or saves the time and goes to **→ 3.4**

**ESC** restores the old value and/or skips back one input-field (MM **→** HH)

### 3.6 Set automatic interval to scroll status displays



Display Interval  
Yes No

Select if operation displays will switch automatically instead of manually switching by ▼/▲ keys  
+/- toggle answer  
↵accept ➔ 3.7

### 3.7 Select Baud Rate for serial RS232 Interface



RS232 Baud Rate  
1200

Available Baud Rate are 1200/2400/4800/9600.  
+/- select value  
↵accept ➔ 3.8

### 3.8 Set Program End Buzzer



Buzzer Prog End  
Yes No

Buzzer sends a signal if a program has finished signal.  
+/- toggle option  
↵accept ➔ 3.9

### 3.9 Set Safety Alarm-Buzzer



Buzzer SafetyBon  
Yes No

In any case of an over temperature alarm situation, the Buzzer will give an audio signal.  
+/- toggle option  
↵accept ➔ 3.10

### 3.10 Set LCD Display contrast



Display Contrast  
75%

+/- change value  
↵accept ➔ 3.11  
ESC restores value

### 3.11 Set Offset between internal PT100 Sensor and actual display



Sensor Offset  
00.0°C

Offsets the internal PT100 sensor with the actual displayed temperature. Calibrate with an external temperature sensor.  
+/- change value  
↵accept ➔ 3.12  
ESC restores value

### 3.12 Confirmation display of storing entered values



Configuration  
Stored...

The Display confirms that the Configuration has been Stored.  
After a few seconds it will return to ➔ 3

## 4 Menu Service Mode



Main Menu  
Service Mode

This menu point is protected by a code and is only available for trained Service-Technicians.

## Operating Displays

### General

Change the display with ▼/▲ keys or set Display Interval to yes in Menu Configuration to let change the display automatically every 10 sec.

### 5 Operating Display: Manual Mode Delayed Start



```
Start-Date
09.09.04 13:10
```

Here you can see the actual Start Date and Time.  
Press ▼ to get next set of operating displays.



```
SetTemp 110.0°C
Holdtime 105:00
```

Here you can see the Set Temp and the Hold Time (dwell time).  
Press ▼ to get next set of operating displays.



```
Fan 100%
Gradient 2.0°C/M
```

Here you can see the Fan-Speed and gradient  
Press ▼ to get next set of operating displays.

### 6 Status Display: Normal Mode Running



```
Set Temp 110.0°C
Act Temp 35.5°C
```

Here you can see the Set Temp and the Actual Temp. Press ▼ to get more information's of the Operating Display.



```
Fan Speed 100%
Timer 105:00
```

Here you can see the Fan Speed and the Timer. Press ▼ to get more information of the Operating Display.



```
Date 05.05.03
Time 14:18
```

Here you can see the actual Date and Time. This is the last information of the Operating Display. Press the ▼ button to see first display again

## 7 Status Display: Program mode Delayed Program Start

If the programmed Start Date/Time has achieved the Display switches to ➔ 8



The „Prog“ LED is flashing, this means there is delayed program start entered

```
Start Date   P04
09.09.04    13:10
```

Here you can see the actual Start Date and Time. Press ▼ to get more information of the Operating Display.

## 8 Status Display: Program mode Program Running

```
Set Temp    90.0°C
Act Temp    35.5°C

Program      04
Step         01

Fan          100%
Gradient    2.0°C/M

Hold Time   120:30
09.09.04    14:09
```

Here you can see the Set Temperature and the Actual Temperature of the Program Step. Press ▼ to get more information of the Operating Display.

Here you can see the Program Number and the Step. Press the ▼ button to get more information of the Operating Display.

Here you can see the Fan Speed and the Gradient. Press the ▼ button to get more information of the Operating Display.

Here you can see the Hold Time and actual Date and Time in the format DD.MM.YY. This is the last information of the Operating Display. Press the ▼ button to see first display again

If the programm has ended a beep tone (5x) will sound and following display will shown:

```
Status#
Program finished
```

Status Message can be confirmed by pressing the ↵key.

## 9 Cancel a running process by ESC Key

A running system is stopped by pressing ESC.

### 9.1 Safety question when stopping a running system

```
Stop Process?
Yes  No
```

+/- Select desired answer

↵accept

If Yes selected: ➔ 9.2

If No selected: ➔ **Back to running status**

### 9.2 Conformation of canceling a process

```
Process stoped
```

Display confirms that the running process has been canceled. After a few seconds it will return to Main Menu ➔ 1

## 10 Messages and Errors

The messages and Errors are announced with a beep tone (5x) and can be confirmed by pressing the ↵ Key.

Errors are severe system failures and must be fixed by trained service people.

### Messages

Message: No Program	Indicates that no program is in memory
Message: Memory Full	Indicates that the program memory is full
Message: Door Open	Indicates that the door is open while you try to start the system (TC40,TC100 only)

### Errors

Error: PT100	PT100 Sensor or cable defect. Call Service
Error: Safety Bond	Safety Controller was active. Call Service
Error: Tnf out of range	Temperature exceeded security range level. Cool down oven. If error persists call Service
Unexpected Error	Call Service

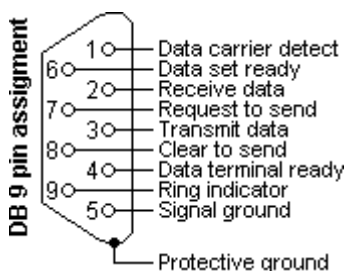
## Printer Operation

### Connecting a Printer

#### Printer Requirements

In order to connect a printer with the serial RS232 Interface of the System following requirements must be fulfilled : Serial RS232 Interface, Min. 1200 Baud Transfer Rate

#### Pin Layout RS232 DB9 Connector System:



Used Pins: 2:TxD , 3:RxD and 5:Signal Ground

Data format: 8 Data Bits, 1 Stop Bit, No Parity

#### Sample printout of a stored program

See also [ Print Program ] ➔ 2.5

```

Program #1

Step: 1
Set Temperature: 100.0 °C
Gradient         1.5 °C/Min
Hold Time:      2:30 HHMM
Fan Speed       100 %

Step 2
Set Temperature: 100.0 °C
Gradient         1.5 °C/Min
Hold Time:      0:45 HHMM
Fan Speed       100 %
.....
.....

```

#### Sample printout of a running log

See also Print Interval ➔ 3.5

```

100403, 09:34

Set Temperature: 100.5 °C
Act Temperature: 100.6 °C
Gradient         1.5 °C/Min
Hold Time:      1:00 HHMM
Fan Speed       94 %

100403, 09:35

Set Temperature: 100.5 °C
Act Temperature: 100.5 °C
Gradient         1.5 °C/Min
Hold Time:      1:00 HHMM
Fan Speed       94 %
.....
.....

```



## Appendix A

### Menu Structure & Input Fields

\* = Menu Point

□ = Input Field

◇ = Decision Input

⊙ = Display only

	Pt		To pt
*	1	Main Menu Temp & Options	
□	1.1	Set Temperature	1.2
◇	1.2	Quick Start? Now Options	6 1.3
□	1.3	Gradient	1.4
□	1.4	Hold Time	1.5
□	1.5	Fan Speed	1.6
□	1.6	Start Date	1.7
□	1.7	Start Time	6 or 7

	Pt		To pt
*	2	Main Menu Program	
*	2.1	Start Program	
□	2.1.1	Select Program	2.1.2
◇	2.1.2	Start Program? Now Delayed	6 2.1.3
□	2.1.3	Set Start Date	2.1.4
□	2.1.4	Set Start Time	8
*	2.2	New Program	2.2.1
□	2.2.1	Select Program	2.2.2
□	2.2.2	Set Temperature	2.2.3
□	2.2.3	Gradient	2.2.4
□	2.2.4	Hold Time	2.2.5
□	2.2.5	Fan Speed	2.2.6
◇	2.2.6	New Step? Yes No	2.2
◇	2.2.7	End of Program Yes No	2.2 2.2.6
⊙	2.2.8	Program stored..	2
*	2.3	Edit Program	2.3.1
□	2.3.1	Select Program / Nr	2.3.2
□	2.3.2	Set Temperature	2.3.3
□	2.3.3	Set Gradient	2.3.4
□	2.3.4	Set Hold Time	2.3.5
□	2.3.5	Set Fan Speed	2.3.6
◇	2.3.6	New Step? No Yes	2.3.7 2.3.1
◇	2.3.7	End of Program No Yes	2.3.6 2.3
⊙	2.3.8	Program stored..	2
*	2.4	Delete Program	2.4.1
□	2.4.1	Select Program	2.4.2
◇	2.4.2	Delete Program Yes No	2.4.3 2.4.1
⊙		Program Deleted	2.4
*	2.5	Print Program	2.5.1
□	2.5.1	Select Program	2.5.2
⊙	2.5.2	Program Printing	2.5

	Pt		To pt
	3	Main Menu Configuration	
□	3.1	Language	3.2
□	3.2	Date	3.3
□	3.3	Time	3.4
□	3.4	Max. Temp	3.5
□	3.5	Print Interval	3.6
□	3.6	Disp Interval	3.7
□	3.7	Rs232 Baud Rate	3.8
□	3.8	Buzzer Prog End	3.9
□	3.9	Buzzer Safety	3.10
	3.10	Display Contrast	3.11
□	3.11	Sensor Offset	3.12
⊙	3.12	Configuration stored	3