datacolor

AHIBA TC MULTIPRECISE ®

USER'S GUIDE

User Documentation
Ahiba® MULTIPRECISE TC

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Safety Precautions and Warnings

Safety Precautions and Warnings

- The unit weight is approximately 68KG (149 lbs). It is recommended that a minimum of 4 persons lift the unit.

- To prevent an electrical shock or fire, have a qualified electrician connect the unit to the appropriate power source. Using an extension cord without protective grounding will invalidate protection.

- Only operate the equipment as instructed by the users manual. Uses of the equipment other than specified in this manual, will impair the instrument.

⚠ **WARNING**   For your safety, turn the power switch OFF, and remove the power cord from the electrical outlet before cleaning or performing maintenance on the Multiprecise TC.

To avoid electric shock or fire, all repairs to the electrical and mechanical components should be performed by a qualified service technician.

The following symbols appear on this equipment:

Surface is hot   **Caution**   **High Voltage**
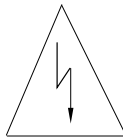
Please observe the following ideograms:

Indicates that a specific action is prohibited.

Indicates that the following function requires precautions.

Indicates important general information.

Important Notes:

☐ⅈ	Please complete the product quality survey form and return it to the address printed on the form. Thank you for helping us to evaluate the quality of our products and services.
☐ⅈ	This user's guide is an essential part of the AHIBA Multiprecise TC. Please retain a copy as a reference.
☐ⅈ	Carefully read the user's manual before installing and operating.

AHIBA Multiprecise TC:

☐ⅈ	Maybe operated, maintained and repaired only by authorized and trained personnel.
☐ⅈ	May be operated only if the unit functions properly.
☐ⅈ	May be operated as laboratory dyeing equipment.
☐ⅈ	Careful cleaning enhances the reliability and extends the service life of the equipment.
☐ⅈ	We reserve the right to make technical changes.
STOP	**Do Not touch the emerging cooling water !** **Caution: Hot !**
⚠	**This ideogram is a warning instruction.** **"Warning: Hot surfaces" DANGER OF BURN INJURIES !**
⚠	The AHIBA Multiprecise TC should only be operated when the high temperature lid and protective glass is in place (Danger of burn injuries from hot surfaces).
⚠	As soon as the dye bath sensor registers a temperature in excess of 140°C, the heaters are shut off automatically and the cooling water starts flowing.

The Ahiba Multiprecise TC should be operated only with filtered and deionized water. This prevents contamination of the valves, calcium deposits on parts in contact with the dye bath and in the cooling unit.

The dosing tube must always be filled with distilled or deionized filtered water.

The pressure relief valve connected to the drain manifold is set to automatically open automatically whenever as excess of 5 bar (tolerance ±0.5 bar) is reached.

Residual Risks:

Observe all auxiliary standards and regulations as cited in the material safety data sheets of all chemicals being used.

Datacolor assumes no responsibility for the handling of chemicals.

Introduction & Typical Applications

AHIBA Multiprecise TC has two independently operated dyeing chambers which continuously circulate the dyebath through the sample, duplicating a beam-and-package dyeing process.

Dyeing chambers may be configured as (2) 1 liter baths, (2) two liter baths or (1) one liter and (1) 2 liter baths. The unit has a variable speed pump that provides a gentle flow in an inside-to-outside direction, assuring level dyeings on all substrates.

The unit is designed to accurately simulate beam-and-package dyeing production in a laboratory environment. This versatile unit is capable of dyeing all types of substrates.

The Multiprecise TC may be purchased with an automatic dosing apparatus, allowing dosing of auxiliaries during the dyeing process. This unit uses a diaphragm metering pump to dispense the chemicals automatically (linear, progressive, degressive) into the dyeing chambers.

The Multiprecise TC utilizes one controller that independently operates the two dyeing chambers. Equipped with the latest controller technology, functions such as bath volume, pressure, flow speed, rinse cycle and end of process drains are programmed quickly and easily. The graphical interface displays information such as temperature, dosing time and amounts, and residual dyeing time for the operators reference.

The use of a memory card allows unlimited storage of dyeing programs and allows easy editing and copying functions to accommodate all dyeing processes.

In summary the Multiprecise TC features the following:

- MULTIPRECISE TC Package Dye Machine Base Unit
- Machine Exterior; Brushed Stainless Steel
- (2) 1 liter Dyeing Chambers That Are Independently Controlled
- (2) Safety Tested Pressure Lids
- (2) Magnetically Driven Centrifugal Pumps for Inside to Outside Flow
- Stainless Steel Hook for Sample Removal
- (2) Rubber Lids for Atmospheric Dyeing
- Electric Heating
- Water Cooling
- Direct Temperature Sensing in the Dyebath
- Control Unit with Graphical Display and Capacity for 60 Programs
- Programmable Functions Include: Cool and Warm Water Volume, Pressure and Vacuum, Flow Rate, Heating and Cooling, Drain and Overflow Rinse
- Memory Card for Additional Program Storage, 99 Programs
- Temperature Range: 25 to 140°C

Type of material:
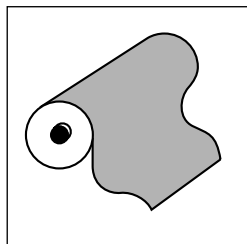
Piece
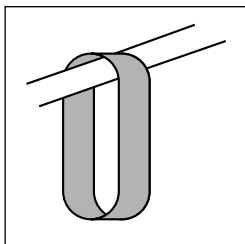
Skein
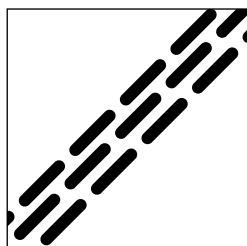
Tops
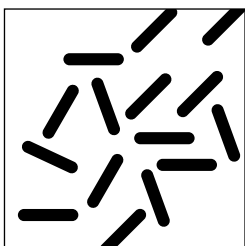
Loose Material

Type of fiber: Synthetic, Natural, Blends

Min. liquor ratio: 1 : 5

Main Components

1. Stainless Steel Outer Body
2. Memory Card Slot
3. Display Unit Indicator Switch
4. Keypad
5. Graphic Display
6. Alarm Indicator Lights
7. Status Panel Process Lights
8. Pressure Indicator Gauge
9. High Temperature Lid
10. Protective Lexan Glass
11. Inner Dyebath Glass
12. Dyebath Withdrawal Valve
13. Dosing Input Tubes (Option)
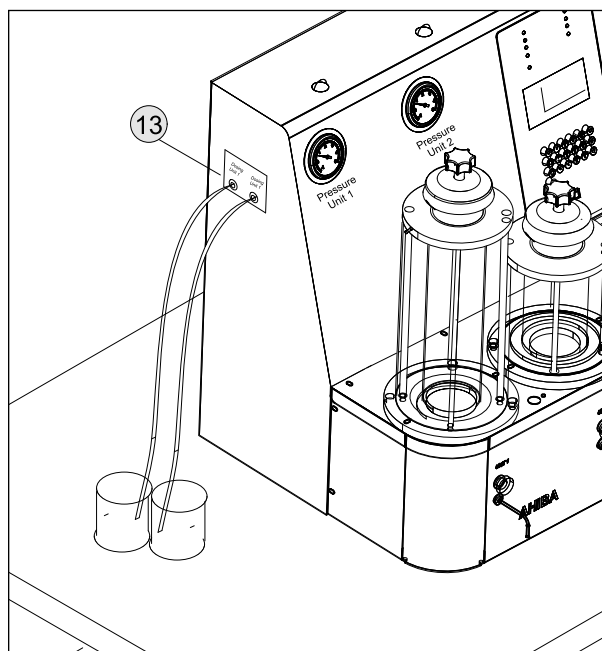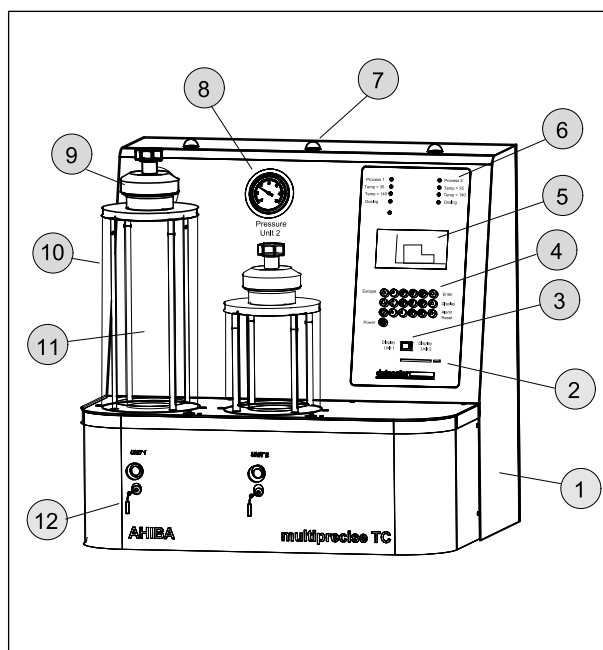
1. Power Line
2. Alarm Output
3. Printer
4. Cold Water Inlet
5. Hot Water Inlet
6. Drain
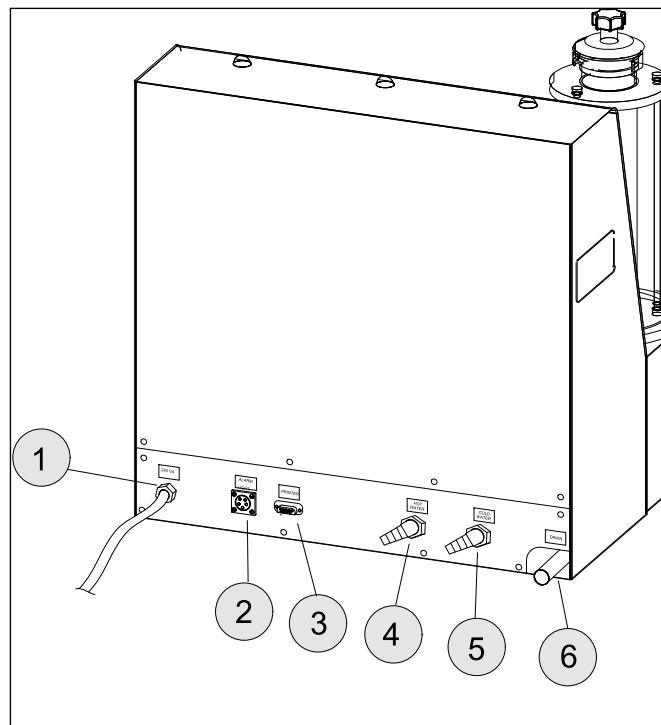
1 Control panel, consisting of LCD display, keyboard, control lights, beaker control switch, and memory card slot.

2 The dye container (1000 or 2000 ml volume) with high temperature lid is shielded by a protective lexan glass, thus providing additional safety for the user.

3 Use the dyebath withdrawal valve to withdraw bath samples from the dyebath. Place a container under the pipe bend and manual turn the knob counterclockwise to withdrawal sample.

4 The dosing feed lines allow additions to the dyebaths from one or several dosing stations.
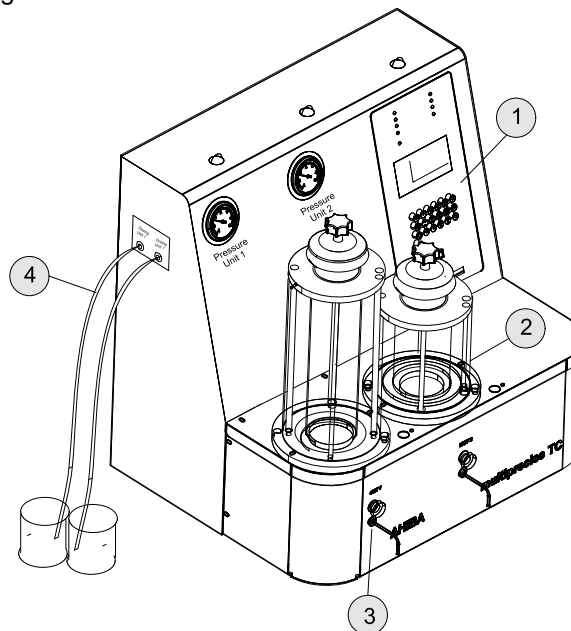
1 HT Lid

2 Dye Basket

3 Dye Glass

4 Pump

5 Motor

6 Magnetic Coupling

7 Metal Beaker

8 Circulation Direction (from inside out)

9 Dyebath
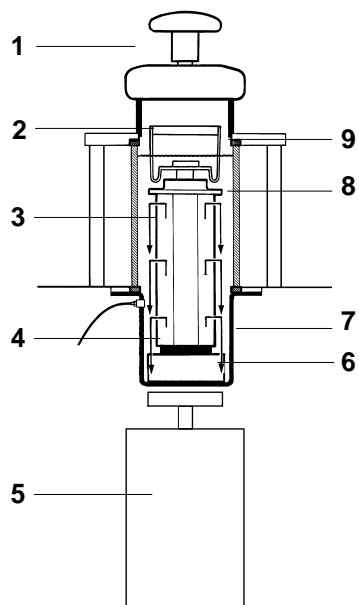
Function Principle

The function principle of the Ahiba Multiprecise TC is based on the centrifugal pump system, devoid of any lines and valves.
The magnetically driven pump feeds the treatment dye bath continuously through the material. During the process, the output of the pump may be regulated and programmed infinitely variably speed / amount up to a maximum output of 7 liters / minute (100% flow).

Dyebath circulates from the inside to outside.

The body of the pump is connected to the material carrier by a bayonet coupling and may be placed into the dye container as one complete unit. The carrier must be locked into position by rotating the carrier inside the beaker, using the loading hook. Two pins on the bottom surface of the pump will engage into slots at the bottom of the beaker and the pump will sit level inside the beaker.

Power up the pump motor only after inserting the body of the pump to ensure magnetic flow between drive and pump magnets.

$\boxed{i}$ *Do not drop pump - Blows may impair the strength of the magnet!*

Pump Complete

1   Bearing Journal

2   Glide Bearing

3   Pump Body

4   Bearing Disc

5   Paddle Wheel

6   Magnet (6-pole)
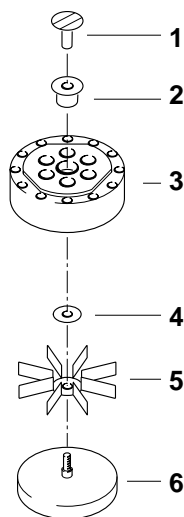
Diaphragm dosing pumps are used in the Ahiba Multiprecise TC allowing linear, progressive or degressive dosages.

The dosing inlets are located on the left side of the unit ensuring rapid distribution of the dosing liquid within the dye container.
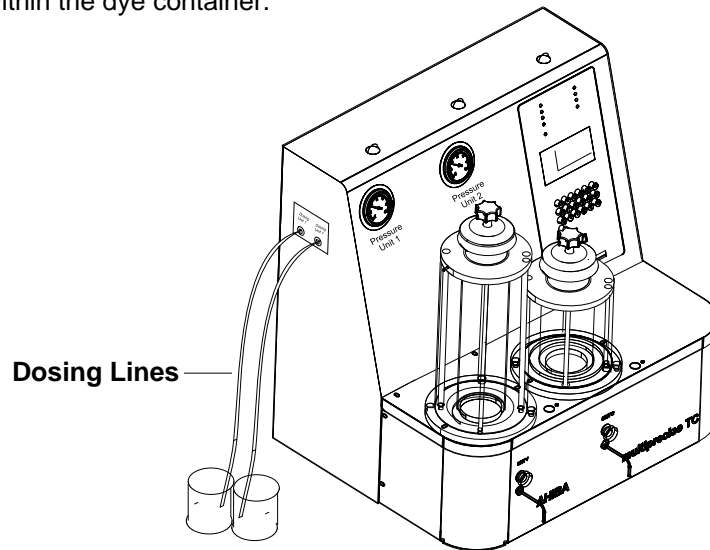
Dosing Lines

Attention:

Before running a process you must prime the dosing lines. This is controlled utilizing the controls on the front display panel. The lines must be completely filled up, so that no dosage errors will occur.

At the end of a process the dosage system must be cleaned thoroughly so that deposits of auxiliaries and or dyestuffs can be avoided in the next process.

The different material carriers and accessories are made of rust and acid-resistant stainless steel.

Loaded material carriers are coupled to the body of the pump and locked in place inside the dye container as one unit.

Example

1   Handle

2   Locking Screw

3   Locking Lid (Teflon)

4   Loaded Metal Dye Tube

5   Coupling

6   Body of the Pump
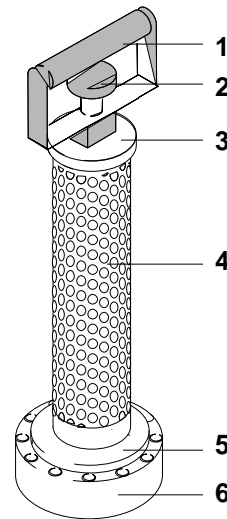
Installation and Start Up

- Setup and connect the warm water inlet supply

- Setup and connect the cool water inlet supply

- Connect the drain

  ⚠ **WARNING**   The tube from the drain outlet must be installed so that human contact with discharging water is impossible. (Danger of burnings) !

- Connect printer (optional)

- Connect the external alarm lamp (optional)

- Connect mains power

- Switch on power

- Application Information

Shown with dosing option
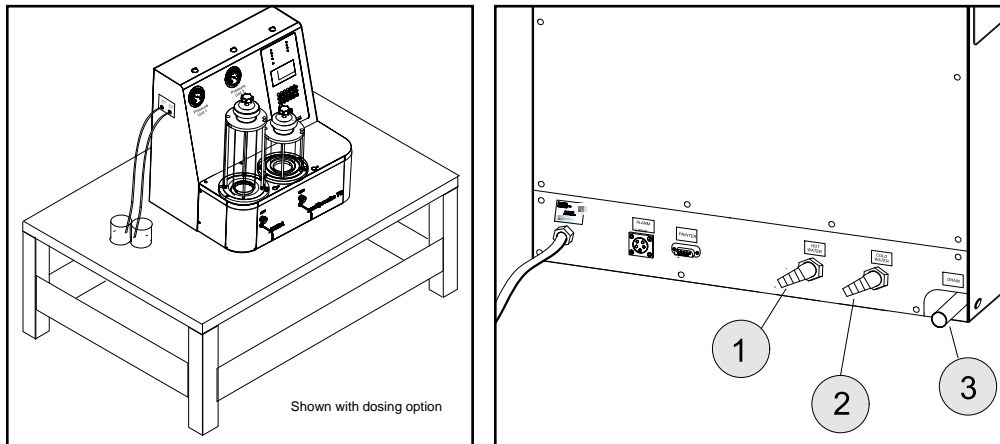
- Place the Ahiba Multiprecise TC on a sturdy / level table.

  ⚠️ **Note: Allow a minimum of 6 inches between the back of the unit and a wall to allow space for hoses. Choose a location in such a way that occurance of heat backup and for direct sunlight will be avoided.**

- Connect the [1] warm water inlet, [2] cold water inlet, and [3] drain hoses (see the following page).

⚠️ Use only filtered, softened cooling water <10°dH !

ⓘ Water filters (part number 942332) are available from Datacolor.

⚠️ The water pressure must be 5 bar (72.5 psi) or less, no less than 2.5 bar (36.25 psi). The water pressure must be consistant in order to achieve accuracy during a water fill. If pressure flucuates +/-2 psi (.14 bar) it is recommended that pressure regulating valves be installed on the hot and cold incoming water lines. Pressure regulating valves can be purchased from Datacolor #62-500048. Valves should be set for minimum pressure.

ⓘ The cooling water temperature should be < 20°C (68°F).

🛑 The tube from the drain outlet (3) must be installed so that human contact with discharging water is impossible. (danger of burnings) !
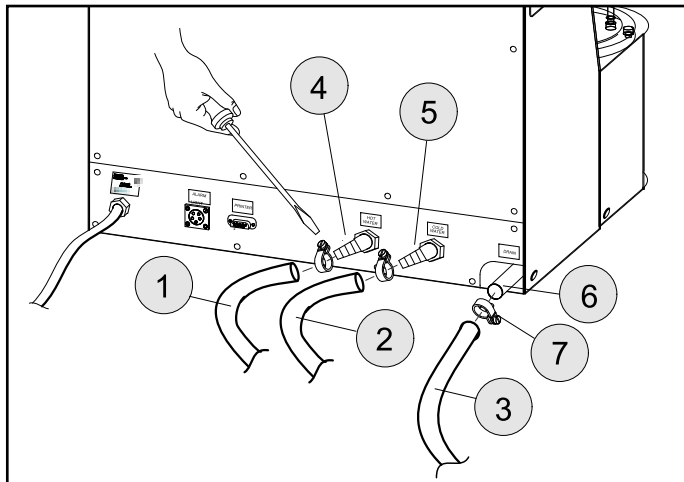
| i | Use pressure hoses [**1**and **2**] with a nominal inner diameter of (10mm / 3/8"). |

| i | Use pressure hose [**3**] with a nominal inner diameter of (25mm / 1"). The drain hose must be able to withstand temperatures up to 140°C (284°F). **If hot drops are performed drain should be hard plumbed.** |

- Hot water inlet nipple [**4**].
- Cold water inlet nipple [**5**].
- Drain nipple [**6**].
- Slide hoses [**1, 2** and **3**] over the hose nipples [**4, 5** and **6**] and secure with hose clamps [**7**].

⚠ **Important!! The drain connection must be lower than the Multiprecise drain output. This drain works on gravity. The drain cannot be level or higher.**
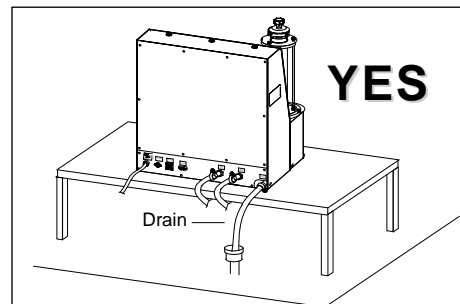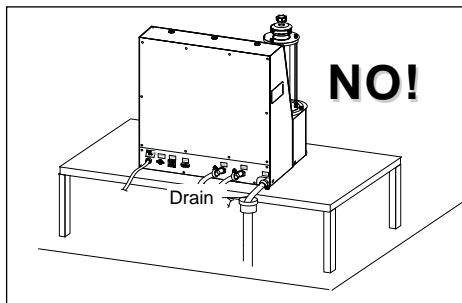
Establishing the power connection
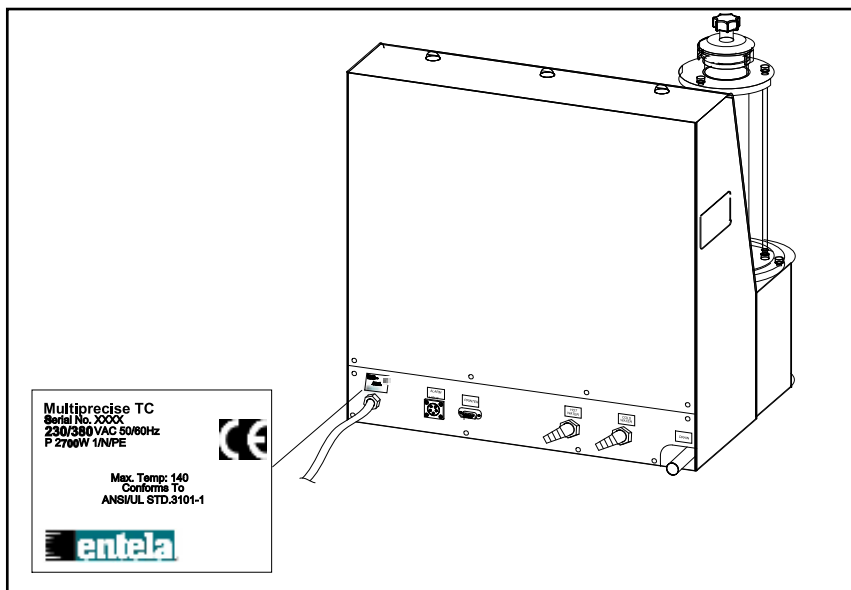
Prior to connecting the Ahiba Multiprecise TC, ensure that the local line voltage agrees with the line voltage specified on the name plate.

A qualified electrician must connect the proper line receptacle to the end of the power cable, in order to meet local requirements. (See the diagrams on the following page for main power supply connections).

Main Power Supply Connection

The Ahiba Multiprecise TC is shipped without a power disconnect plug. A
certified electrician must install an appropriate plug that meets local
requirements.
The Plug must be rated for 20 amps, 480V minimum, 3L / N / GN.

For 380 V AC standard mains (e.g. Europe)
380 V AC, 3/N/PE, 50/60 Hz, 3300 W
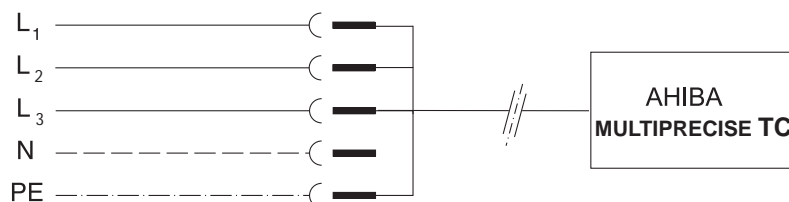
For 220 V AC high power mains (e.g. U.S.A., Canada, Japan)
220 V AC, 3/PE, 50/60 Hz, 3300 W
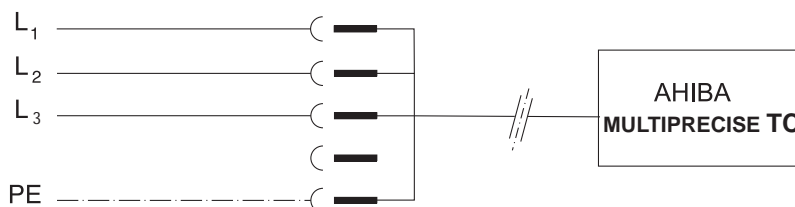
If the unit is connected permantly to the main power supply, then a
13 amp (minimum) circuit breaker must be installed as a mean for
disconnection.

The circuit breaker must be in close proximity to the unit and within easy
reach of the operator.

The circuit breaker should be marked as the disconnecting device for the
unit.

1. Connect the serial printer via the RS 232 printer cable to the printer port [**1**].

Supported printer types: HP Deskjet (or equivalent)
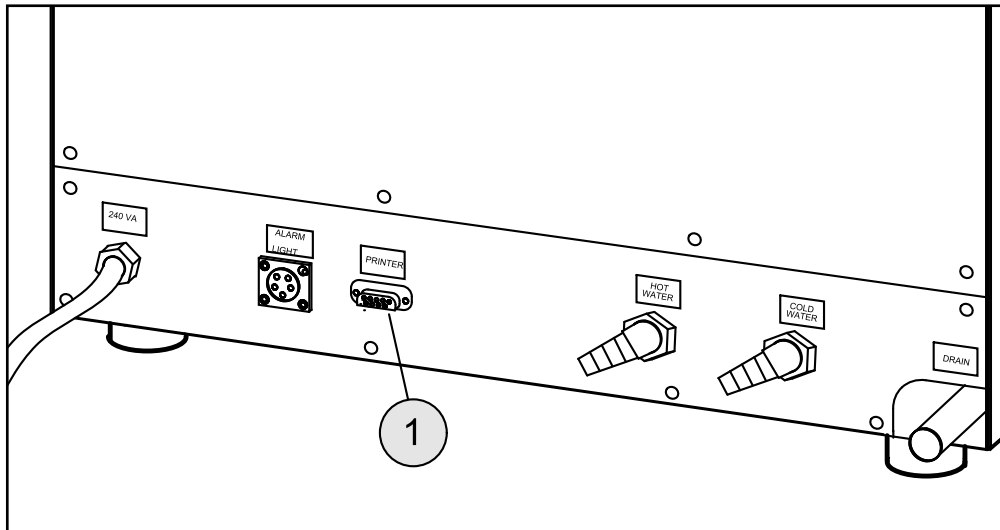
2. Configure the serial printer:
- 8 data bits
- 1 stop bit
- no parity bit

3. Set up the AHIBA Multiprecise TC control unit. See Table of Contents for chapter on programming the controller.

**Alarm Light
(Optional)**
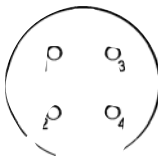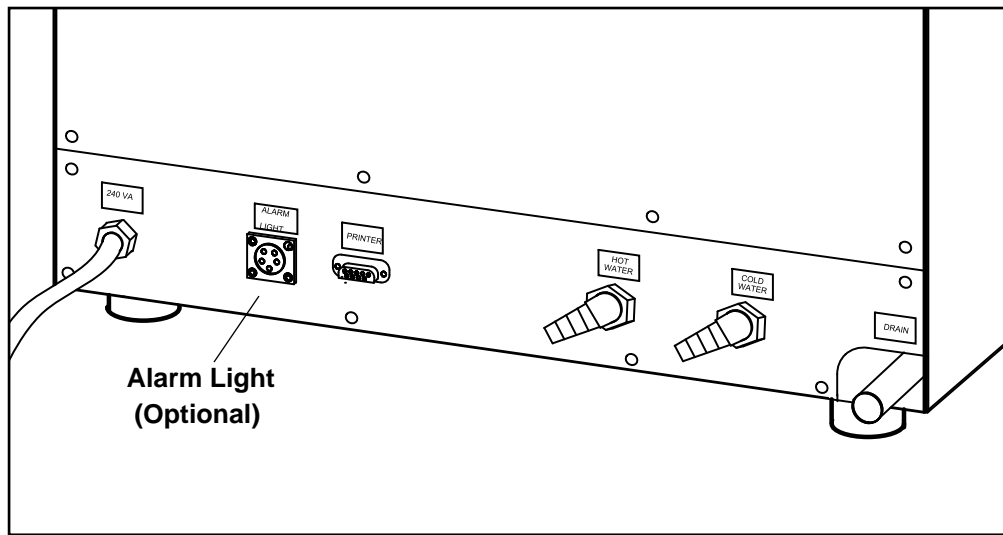
Pin 3 (+)
Pin 4 (-) $\}$ 24V

<u>**Instrument**</u>
Connector: Amp 206430-1
Pins: Amp 66101-2

<u>**Mating Connector**</u>
Connector: Amp 206429-1
Pin: Amp 66099-2

Technical Data

- External dimensions: 540 x 660 x 670 mm   (H x W x D)
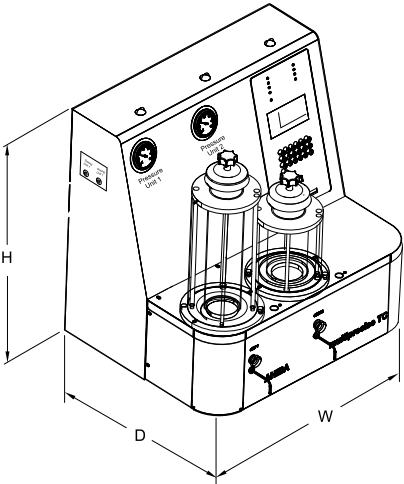
- Weight: 68 kg (150 lb)

- Connections: RS 232 C for printer
                                       (data format: 8 data bits
                                                             1 stop bit
                                                             no parity)
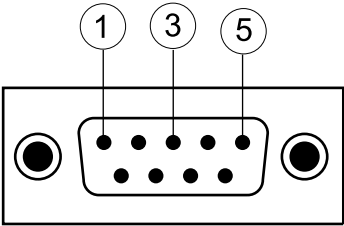
Pin no.	Signal	Description
1	CD	Input signal level
3	TXD	Output data
5	GND	Ground

C 91E/4pole plug for flashing alarm light

Electrical voltages / power

- Voltage: 230V ±10% or 380V ±10% 50/60Hz, 3 phase

- Max. heating power: 2800 W

- Total power input: 3300 W max.

Water

- Water pressure: 5 bar (72.5 psi) maximum

- Water hardness: <10° dH

- Water consumption: approx. 6.54L / min. (1.7 gpm)

- Water Connections: warm water inlet   10mm ID / 3/8"ID
                                                  cool water inlet   10mm ID / 3/8"ID
                                                  drain   25mmID / 1"mmID

Temperature:

- Operating: 5° C to 40° C, 80% max. relative humidity
                                                up to 31°C, 50% relative humidity up to
                                                40°C, altitude up to 2000 meters.

- Cooling water: < 20°C, ideal

- Accuracy: ±1.0°C

The following fuses are used for circuit protection:
Note: Fuses must be changed by a trained technician.

Power Interface Board

F1 = 6.3AT
F2 = 8AT

Main Fuse

F_{main} = 8AT

24V Unregulated Power Supply

F_{ps} = 25AT

Procedure for Dosing

Dosing can be activated from manual mode or program mode. In manual mode there is only one dosing step allowed, while in program mode dosing can be activated multiple times.

The MPTC dosing system is semi-automatic, this means that operator interaction is required. The controller will alert the operator with an alarm and with an instruction on the LCD display. There are only two types of action required. One is exchanging between chemical bottle and water. The second is keypad entries to continue the program.

Manual Mode

1 Before beginning a process:
- Ensure dosing tubes have been primed with water.
- Insert dosing tubes into the dosing auxiliary.

2 Process begins when "Dos Start" time is reached:
- Dosing pump turns ON at 80% pump power to fill tube (dead volume) with dosing solution.

3 Begin Dosing:
- Dosing begin with the speed (rate) as programmed.

4 When Dose amount is reached:
- An alarm message in the Status Line will appear "Press Esc or go to Run Program Menu".
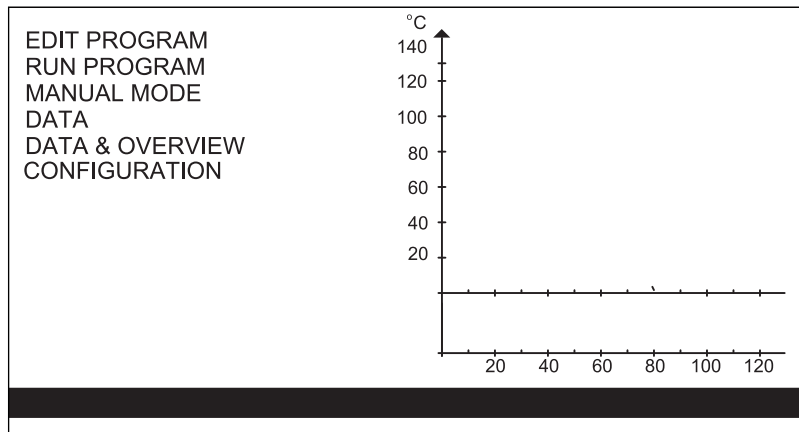
Fig. 1

- At this the desired dosing solution amount has been dosed out of the dosing beaker, but some of it still remains in the dosing tube.
- After pressing [Esc] key or go to Run Program Menu the message below will appear.
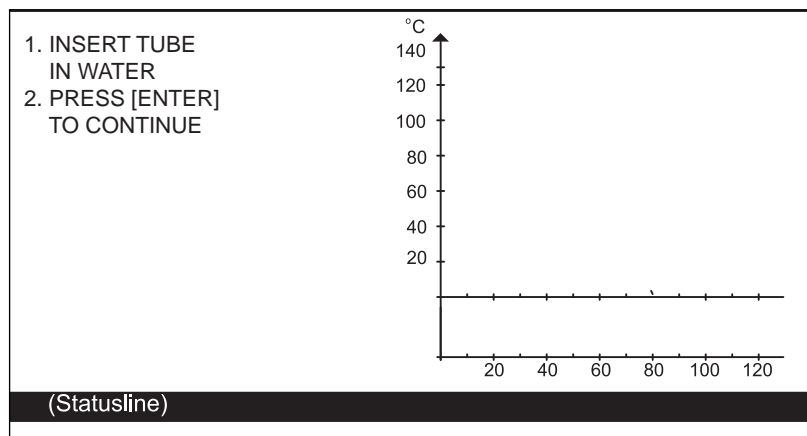
Fig. 2

· **Single Dosing**

Same operation as in manual mode.

· **Multiple Dosing**

1 Before beginning a process:
- Ensure dosing tube is filled with water.
- Insert dosing tube in the first dosing auxiliary.

2 Begin Process:
- When "Dos Start" time is reached the dosing pump turns on at 50% pump power to fill the tube (dead volume) with the first dosing auxiliary.

3 First dosing begins:
- Dosing begins with the speed (rate) as programmed.

4 When dosed amount is reached:
- An alarm message is displayed on the LCD display status line "Press Esc or go to Run Program Menu".
- At this time the first dosing solution has been dosed out of the dosing beaker, but some still remains in the dosing tube.
- After pressing [Esc] key or go to Run Program Menu, the message as shown in Fig. 2 will appear.
- Follow the instructions on the screen.

5 After pressing the [Enter] key, dosing continues for the remaining dosing auxiliary in the tube.

6 First dosing is completed. The desires amount of the first dosing auxiliary is now in the dyeing beaker and the dosing tube is filled with water.

7 An alarm message as in Fig. 1appears. After pressing [Esc] or go to Run Program Menu, the display will appear as shown in Fig. 3.

8 After pressing the [Enter] key, the process continues.

9   Second dosing begins (repeat steps 1-7).

10 All dosing will repeat steps (1-7) except the last dosing (steps 1-6).
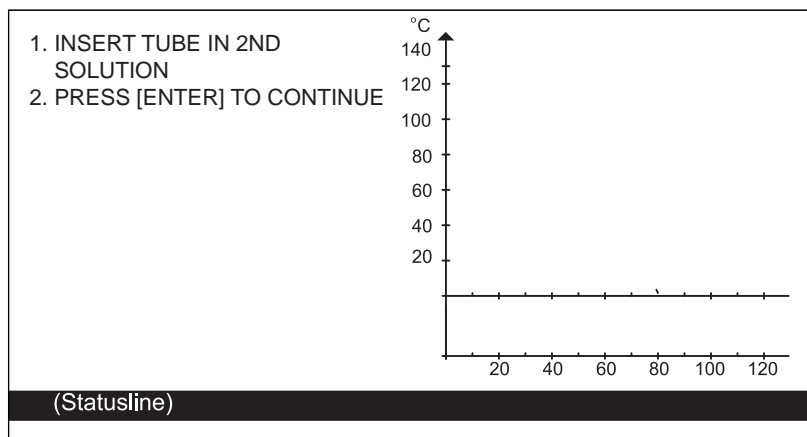
Fig. 3

Calibration

Water Flow Meter Calibration:

A. Ensure tube is filled with water.
    Go to: **MANUAL MODE, MANUAL FUNCTION, FILL CW 50ml** to fill tube with
          water.

B. Drain beaker.
    Go to: **MANUAL MODE, MANUAL FUNCTION, DRAIN XXsec.** Ensure
          the beaker lid is on to build pressure up so water is pushed out of the
          beaker.

C. Release pressure in the chamber by pressing the manual "Pressure Relief" valve
    switch located next to the chamber as shown below.
    **Note: It is important to maintain atmospheric pressure during calibration for
          accuracy.**
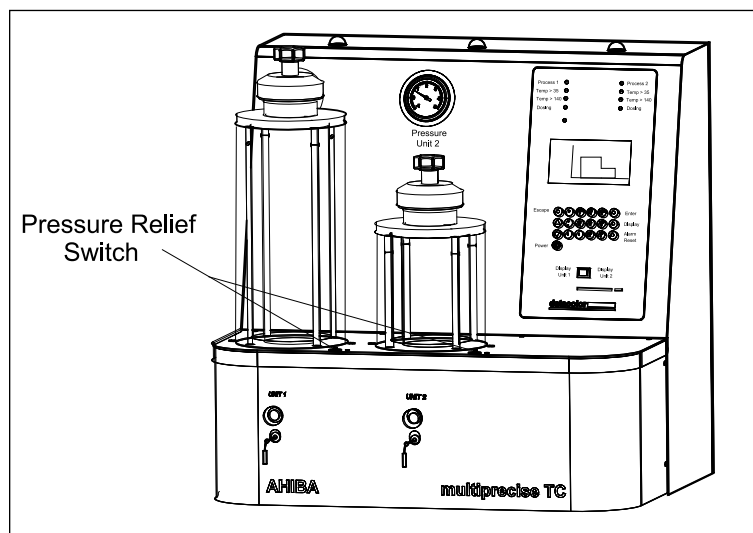
Calibration:

A. Go to: **CONFIGURATION, USER SETUP, CAL WATER FLOW**

B. The menu as shown below appears:

> **PULSE / ltr   2220**
> **EXECUTE**

Move cursor to **EXECUTE** and press [Enter].

C. Measure the water in the beaker. To measure the water, drain the water by opening the manual valve withdrawal knob. To help push water out, close the lid and go to **MANUAL, FUNCTION, PRESSURE**. The volume should be 200 ± 2% ml. Repeat to ensure that the first data is correct.

D. If the measured volume is differnet and exceeds the tolerance, then enter the new value per the following formula:

$$(1 + \frac{200-XXX}{200}) \; * \; 2220 = YYYY$$

> Where: XXX is the measured volume drained out of the beaker. And YYYY is the new value to be entered in Pulse / Ltr.

E. The newly enter value has not been saved. To save value, press **EXECUTE** again. When finished, press [Esc] twice. Press [Enter] when confirmation menu appear.

> SAVE PARAMETERS
> Yes, press [Enter]
> No, press [Esc]

Verify Calibration Result:

F. Go to **MANUAL FUNCTION, FILL CW 100ml.**

G. Verify that the volume is 100ml ± 2%.

H. Repeat for 200ml and 400ml.

I.   If necessary repeat steps D - F above.

General Instruction:

- The dosing accuracy of fluids is dependent on the type of chemicals as well as thier stock solution concentration (specific gravity).

- The Ahiba MPTC is calibrated with water at the factory. It is required for the operator to recalibrate the unit with the chemical to be used.

- By means of calibration, the exact quantity can be dosed (varying specific gravities can therefore be calibrated out).

Equipment needed:

Measuring cylinder (graduated beaker).
Recommeneded beaker size is 50ml for better accuracy.

1. **CALIBRATE**

   a. Ensure tube is primed with water. If not go to [**CONFIGURATION**], [**DOSAGE**], [**PRIME TUBE**].
   b. Fill graduated beaker with 50ml of water and insert dosing tube into the beaker.
   c. Go to [**CONFIGURATION**], [**DOSAGE**], [**CALIBRATE**], press [Enter] key.
   d. When finished record the volume dosed (Volume dosed = 50ml - remaining volume in the beaker).
   e. Repeat and calculate the average value. Enter the average value in "MEASURED XX.Xml" and press [Enter] key.
   f. Press [Esc] to exit and then [Enter] key to save value.

2. **DOSING VERIFICATION**

   a. Fill graduated beaker with with 50ml of water and insert dosing tube in the beaker.
   b. Go to [**CONFIGURATION**], [**DOSAGE**], [**DOS VERIFICATION**], enter 10ml and press [Enter].
   c. Verify that the dose amount is 10ml ±0.5ml, increase the "MEASURED XX.Xml" by 0.3 in step d. Decrease the value if the opposite is true. Verify again until the dose volume is within tolerance.

   The tolerance is XXml ±0.5ml or XX ±2%

Controller

Elements above the display:

(1) Process LED   Flashes when a process (program) is running
(2) Rotary knob   Display contrast control
(3) Switch   Display unit selector switch

Keypad:

[POWER]	On / Off switch
[▲]	Move cursor upward
[▼]	Move cursor downward
[ESCAPE]	Return to previous menu
[F]	Function key
[+/-]	Invert sign
[0] - [9]	Alpha-numeric keys
[ENTER]	Confirm input
[DELETE]	Cancel a keypad entry or a program
[ALARM RESET]	Cancel the alarm

Keys

0	0 and space
1	. , ? ! - & %
2	a b c
3	d e f
4	g h i
5	j k l
6	m n o
7	p q r s
8	t u v
9	w x y z

Function keys

[F] [▲]	Jump cursor to beginning of previous step
[F] [▼]	Jump cursor to beginning of next step
[F] [0]	Go to start of virtual screen
[F] [9]	Go to end of virtual screen
[F] [2]	A B C
[F] [3]	D E F
[F] [4]	G H I
[F] [5]	J K L
[F] [6]	M N O
[F] [7]	P Q R S
[F] [8]	T U V
[F] [9]	W X Y Z

STOP Do not proceed unless the unit has been installed according to the
installation instructions. Switch on the unit by pressing the power [on / off]
button.

The display is activated. After a few seconds the self diagnostic program is executed.
The main menu is displayed.

```
                                    °C
EDIT PROGRAM                       140
RUN PROGRAM
MANUAL MODE                        120
DATA                               100
DATA & OVERVIEW                     80
CONFIGURATION
                                    60
                                    40
                                    20


                            20   40   60   80  100  120
```
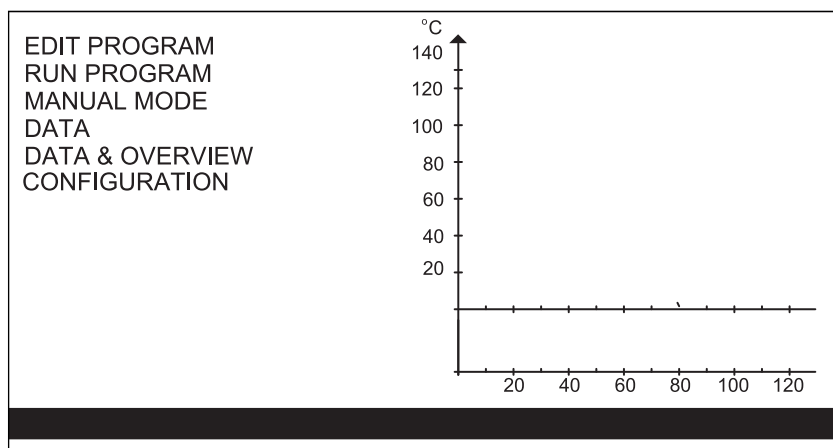
Status line

Time, error and status messages are displayed in the status line. The last character of the status line indicates if a process is running.

No process:	´ ´	(blank)	no «M», «P» or «H» blinking
Manual process:	´M´	(blinking)	when a process is running
Automatic process:	´P´	(blinking)	when a program is running
Hold process:	´H´	(blinking)	when a program has been halted
Delayed run process:	´D´	(blinking)	when a program is set to run at a later time

Time display

Time is displayed in the status line
in the following format: **MM-DD-yyyy hh:mm**
e.g. : 03-02-2001 15:37

MM:	month
DD:	day
yyyy:	year
hh :	hour
mm :	minute

Status messages

A status message is acknowledged by pressing any key. It is then replaced by the current time.

Error messages

An error message will remain displayed until it is acknowledged by [ALARM RESET] and the fault is remedied. If more than one alarm is issued, the alarm with the greatest priority will be displayed. The current time will not be displayed until all faults are corrected.

General remarks

The AHIBA MPTC controller can store up to 99 dyeing programs. Each program may contain up to 60 Time / Temp steps. Up to 99 additional programs may be stored on the memory card. Programs remain stored, even during a power failure.

Limit values

During programming all entries are checked against the following limits:

TEMPERATURE: +20   …   +140° C

TIME in min.   000   …   180

GRADIENT: -6.0   …   +6.0° C/min.

FLOW: 10…100%

HOLD: 0…1

FILL CW   1...2000ml

FILL WW   1...2000ml

RINSE CW   1...6500ml

RINSE WW   1...6500ml

PRESSURE   1...120sec

VACUUM   1...120sec

DRAIN   1...120sec

Enter a gradient only when an exact ramp is required. For maximum heating or cooling rate, enter (0) for a gradient.

General Information

• The local memory can accommodate up to 99 programs.
• The memory card can accommodate up to 99 programs.
• A program may contain up to 60 steps.
• A step consists of two types, a Function or a Process. A step for a Process consist of Temperature, Gradient, Time, Flow, and Dosing. A step for a Function can be any one of these function: FILL, RINSE, PRESSURE, VACUUM, DRAIN, HOLD.

Note: Programming can be executed from either active unit.

Procedure:

1 With cursor **[▲] / [▼]** choose EDIT PROGRAM in the main menu. Press **[ENTER]** to activate the submenu.

2 Choose DIR PROGRAMS. Press **[ENTER]** to activate the program directory submenu.

3 The display now shows a complete overview of the program memory positions that have been used.

4 Press **[ESC]** once to return to the **EDIT PROGRAM** menu.

5 With the cursor **[▲] / [▼]** choose **EDIT PROGRAM No._.**

6 Enter the number of the program to be created or the number of an existing program. Press **[ENTER]**. The first step is displayed.

7 The first step is to name the program. The default name "NEW" will appear. See section Menu: "Edit Program names". Press **[ENTER]** to accept file name and proceed with program editing.

8 Enter the program values by referring to the example on the following page. This is a simple example of a dyeing process. Try to program this example.

Introduction

The Multiprecise TC is a dual unit machine. Each unit runs independently and controlled by a single controller. The control function for both units can be accessed by switching the display information via the display unit selector switch. The active unit information is shown on the display indicated by "UNIT X" at the top right of the LCD display, where X indicates if Unit 1 or 2 is being displayed.

Program Example

ADD NEW FUNCTION		[Enter]
STEP 01		
FILL	600ml	[Enter]
NEW PROCESS		
STEP 02		
HOLD		[Enter]
NEW PROCESS		[Enter]
STEP 03		
Temp	60.0°C	[Enter]
GRAD	+6.0°C/Min	[Enter]
TIME	10 Min	[Enter]
FLOW	70%	[Enter]
DOSAGE	1 LIN	[Enter]
DOS START	1 Min	[Enter]
DOS VOL	20 ml	[Enter]
DOS TIME	20 min	[Enter]
STEP 04		
Temp	80.0°C	[Enter]
GRAD	+4.0°C/Min	[Enter]
TIME	30 Min	[Enter]
FLOW	70%	[Enter]
DOSAGE	2 PROG	[Enter]
DOS PROGR	70%	[Enter]
DOS START	5 Min	[Enter]
DOS VOL	5 ml	[Enter]
DOS TIME	25 min	[Enter]

STEP 05

TEMP	80.0°C	[Enter]
GRAD	+4.0°C/Min	[Enter]
TIME	30 Min	[Enter]
FLOW	70%	[Enter]
DOSAGE	3 DEGR	[Enter]
DOS DEGR	70%	[Enter]
DOS START	5 Min	[Enter]
DOS VOL	20 ml	[Enter]
DOS TIME	25 min	[Enter]

STEP 06

DRAIN	30 sec	[Enter]

STEP 07

RINSE CW	2000 ml	[Enter]

STEP 08

DRAIN	30 sec	[Enter]

```
                              °C
  EDIT PROGRAM              140
  RUN PROGRAM
  MANUAL MODE              120
  DATA                     100
  DATA & OVERVIEW           80
  CONFIGURATION
                            60
                            40
                            20

                                 20   40   60   80  100  120
```
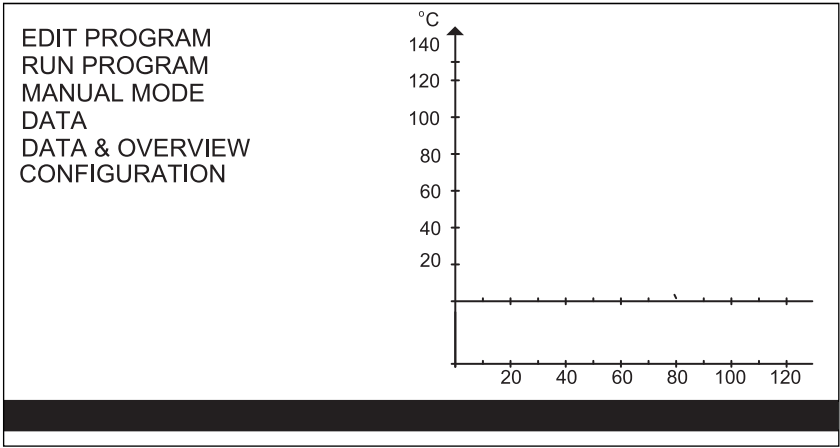
By positioning the cursor **[▲] / [▼]** at the desired command line you can branch to the following sub-menus:

EDIT PROGRAM   Menu for editing, deleting, copying programs.

RUN PROGRAM   Menu for running programs (process).

MANUAL MODE   Menu for editing and starting a manual process (only 1 step).

DATA   Display the current temperature or current condition.

DATA & OVERVIEW   An enlarged display of temperature and remaining time of the program.

CONFIGURATION   Menu for changing the equipment configuration.

```
┌─────────────────────────────────────────────────────┐
│                                          UNIT 1      │
│  DIR PROGRAMS                   °C                    │
│  EDIT PROGRAM NO._            140                     │
│  DELETE PROGRAM NO._          120                     │
│  DELETE ALL PROGRAMS          100                     │
│  PRINT PROG. NO_               80                     │
│  COPY PROGRAM                  60                     │
│  DIR MEM CARD                  40                     │
│  LOAD FROM MEM CARD            20                     │
│  DEL MEM CARD PRG_                                    │
│  DEL ALL MEM CARD                                     │
│                              P1    20  40  60  80 100 120 │
│                                                      │
│ ▌(Statusline)                                        │
└─────────────────────────────────────────────────────┘
```
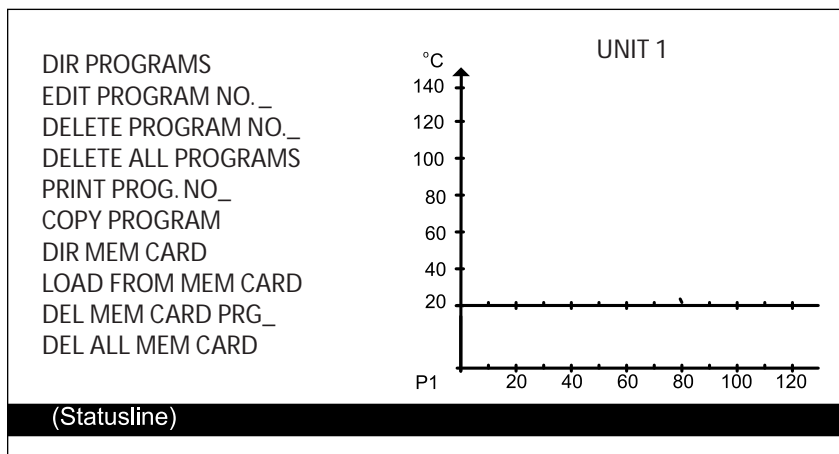
By positioning the cursor **[▲] / [▼]** at the desired command line the following manipulations can be performed with the programs.

DIR PROGRAMS   Displays the programs locations in the local memory.

EDIT PROGRAM No._   Input a new or select an existing program by entering the corresponding program number (1...99). Press **[ENTER**] to activate the program. (see section on Edit Program Number").

DEL PROGRAM No._   Choose a program to be deleted by entering its number (1...99). Press **[ENTER**] to call up the program. Answer the confirmation prompt by **[ENTER**] or reject the command by pressing **[ESC**].

DEL ALL PROGRAMS   Deletes all programs in the memory by pressing **[ENTER**]. Call up the function by **[ENTER**]. Answer the confirmation prompt by **[ENTER**] or reject the command by **[ESC**].

PRINT PROG No._   Choose the program to be printed by pressing a program number (1..99). Call up the program by **[ENTER]**   . Answer the confirmation prompt by **[ENTER]** or reject the command by **[ESC]**.

COPY PROGRAM   Copies a program from a local memory position to a different one. Call up the sub-menus by **[ENTER]**.

DIR MEM CARD   Displays the directory of the memory card. Unassigned locations = dot; assigned locations = number 1-99. Call up the function by **[ENTER]**.

LOAD FROM MEM CARD   Copies program from the memory card to the local memory. Press **[ENTER]** to call up the submenu.

SAVE TO MEM CARD   Saves the program in the local memory to the memory card. Press **[ENTER]** to call up the function. Answer the confirmation prompt by pressing **[ENTER]** or reject the command by **[ESC]**.

DEL MEM CARD PRG_   Deletes a program on the memory card [1...99]. Press **[ENTER]** to call up the function. Answer the confirmation prompt by **[ENTER]** or reject the command by **[ESC]**.

DEL ALL MEM CARD   Deletes all programs on the memory card. Press **[ENTER]** to call up the function. Answer the confirmation prompt by **[ENTER]** or reject the command by **[ESC]**.

The screen below is the default screen for a new program. Additional screen information will appear as program steps are added.

```
Program Name                    °C
                               140

xxxxxxxxxxxxxxxxxxx            120
ADD NEW PROCESS               100
ADD NEW FUNCTION               80
INSERT PROCESS 0
INSERT FUNCTION 0              60
DEL LAST STEP                  40
DEL STEP 0                     20
END


                          20   40   60   80  100  120
    Statusline)
```
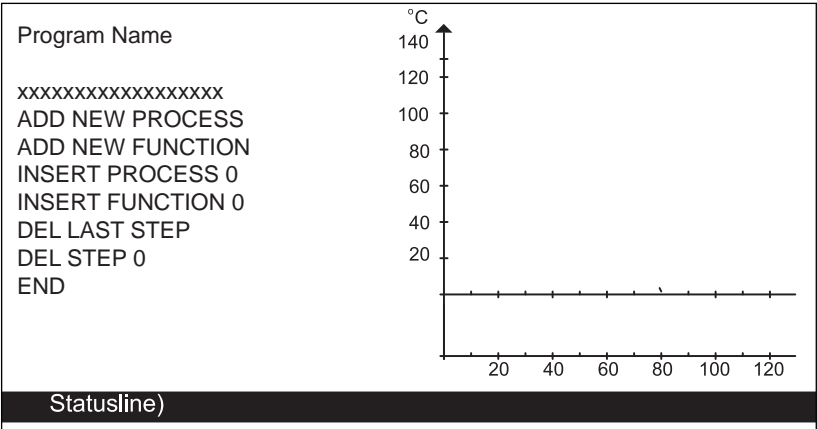
Program names can be added for easy identification of a process job. A maximum of 18 characters including spaces can be typed in via the control panel keypad.

Note:
Program name: The default name is "New". The program name can be entered using the keypad, which is similar to that of a telephone. See below for more information.

Key	**Press Repeatedly**
0	space
1	. , ? ! - & %
2	A B C
3	D E F
4	G H I
5	J K L
6	M N O
7	P Q R S
8	T U V
9	W X Y Z

The F_key acts as a caps lock. In addition the F_key also can change the functionality of the "delete" key. Pressing the "F" and "delete" keys together will change the "delete" key to either "delete" or "backspace".

In the RUN PROG menu you can start or stop a program. The subsequent menu depends upon whether or not a process is running.

If no process is running, the following menu is displayed:

```
RUN PROG          No._        °C
DELAYED RUN P.    No._    140
DATA AND OVERVIEW        120
DATA                    100
                         80
                         60
                         40
                         20
                             P1    20    40    60    80   100   120
   (Statusline)
```
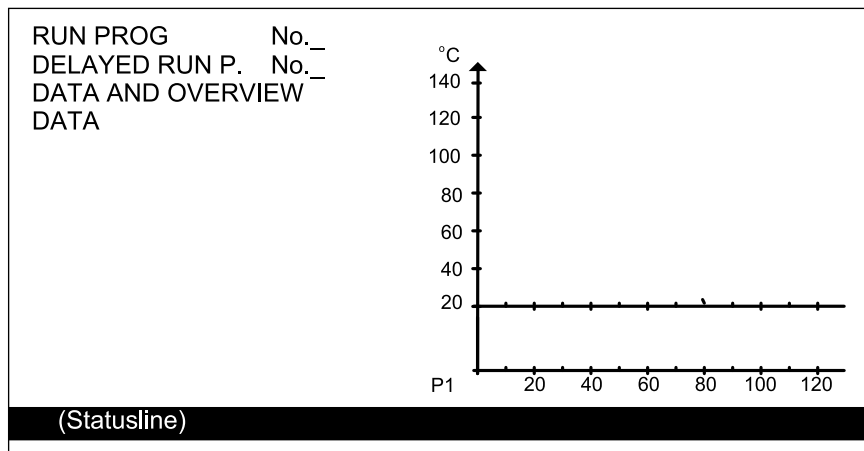
RUN PROG NO._   Start a program. Enter the desired program number. Press **[ENTER]** to start the program. Befoer the program starts, a submenu will appear to allow the program to be started at any step. The default step is 1.

DELAYED RUN NO._   Delays the start of a program. Enter the desired program number. Press **[ENTER]** to call up the function. Enter the start date and time (mm-dd-yyyy hh/mm)and press **[ENTER].**

DATA & OVERVIEW   Activate the overview mode. Press **[ENTER]** to call up the function.

DATA   Display the detailed data menu. Press **[ENTER]** to call up the function.

If process is running the following menu is displayed:

```
DATA & OVERVIEW
DATA
END
HOLD - CONTINUE




        (Statusline)
```

DATA & OVERVIEW   Activate the overview mode. Press **[ENTER]** to call up the function.

DATA   Display the detailed data menu. Press **[ENTER]** to call up the function. (See the following page: "Display Actual Values")

END   Terminate the current process. Press **[ENTER]** to end the process. Answer the confirmation prompt by **[ENTER]** or reject the command by **[ESC].**

HOLD - CONTINUE   Hold the current process. (Also used to continue a process after a programmed HOLD). Depending upon the initial situation either the HOLD or the CONTINUE menu is activated. Press **[ENTER]** to call up the function. Answer the confirmation prompt by **[ENTER]** or reject the command by **[ESC]**.

When the DATA menu is selected, the actual process values are displayed. This display can only be exited with [ESCAPE]. Depending upon the operating mode (M or P), the values are displayed as follows (refer to Appendix 4):

No process running

If no process is running, the ACTUAL temperature is displayed as follows:

Tis   +___•_°C   Actual temperature

Automatic process running (P)

The current program step is displayed in every line. The following values are displayed:

Tis   +___•_°C   Actual temperature

Tset   +___•_°C   Set temperature of the step

TIME   ___ min   Duration of Tset to be maintained (starts when the Tset temperature is reached)

GRAD   +_•_°C/m   Nominal gradient (°C/min)

POWER   +___%   Current heating or cooling power (+ Heating, - Cooling)

FLOW   __ %   Motor RPM, %

HOLD   _   Will stop process when the nominal value is reached (0/1 = OFF/ON)

START-TIME
MM-DD-yy hh:mm   Starting time of the currently running program

PROGRAM No._   Number of the currently running program

STEP No._   Current step in the process

Manual process (M)

The following process values are displayed:

Tis   +___•_°C   Actual temperature

Tset   +___•_°C   Set temperature of the step

Time   _ min   Duration of Tset to be maintained

GRAD   +_•_°C/m   Nominal gradient (°C/min)

POWER   +___%   Current heating or cooling power (+ Heating, - Cooling)

FLOW   __ %   Motor flow

HOLD   _   Will stop process when the nominal value is reached (0/1 = OFF/ON)

START TIME
MM-DD-yy hh:mm   Starting time of the currently running program

In the MANUAL menu you can start and stop a 1 step dyeing process. The menu below is displayed when you enter into the MANUAL menu.

```
                              °C
                             140
    MANUALPROCESS            120
    MANUAL FUNCTION          100
                              80
                              60
                              40
                              20
                             P1    20   40   60   80  100  120
 (Statusline)
```
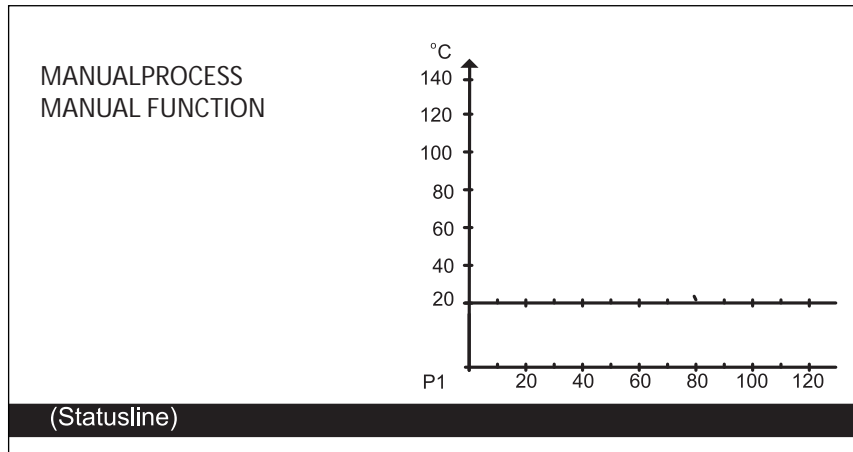
MANUAL PROCESS   Press **[ENTER]** to call up the submenu as shown
                            below.

                            TEMP   +20.0°C
                            GRAD   +0.0°C / min
                            TIME   0 min
                            FLOW   10%
                            DOSAGE   0 NONE
                            RUN PROCESS
                            END PROCESS
                            DATA

MANUAL FUNCTION   Press **[ENTER]** to call up the function.

                            FILL CW   0 ml
                            FILL WW   0 ml
                            RINSE CW   0 ml
                            RINSE WW   0 ml
                            VACUUM   0 sec
                            PRESSURE   0 sec
                            DRAIN   0 sec
                            END FUNCTION

In this menu, you can configure your equipment to suit your application. See appendix 6.

```
SET TIME
COMMUNICATIONS
DOSAGE
USER SETUP
INSTALLATION
```

°C
140
120
100
80
60
40
20

P1   20   40   60   80   100   120

(Statusline)
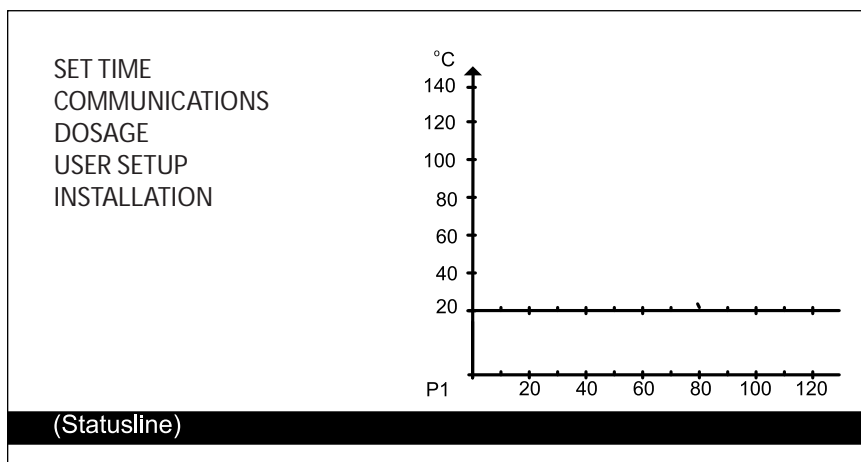
SET TIME	Enter the system time and date. Press **[ENTER]** to call up the function. To store the data press **[ENTER]**.
COMMUNICATION	Select the printer type (Epson FX80, HP Deskjet, or equivalent). Select the baud rate setting for printer. Select an interval for which the data is to be printed out.
DOSAGE	This menu allows the user to perform dosing related functions such as RINSE, DRAIN, and CALIBRATION. See appendix 7.
INSTALLATION	Call up the installation menu.

⚠ **Access is restricted to factory an DCI personnel!**

USER SETUP	Here you can choose the setting of the alarm beeper, the sensor offset, and the menu language.

```
PRINTER BAUD RATE          °C
PRINT INTERVAL 00:00      140
                         120
                         100
                          80
                          60
                          40
                          20
                         P1      20   40   60   80   100  120
```

(Statusline)
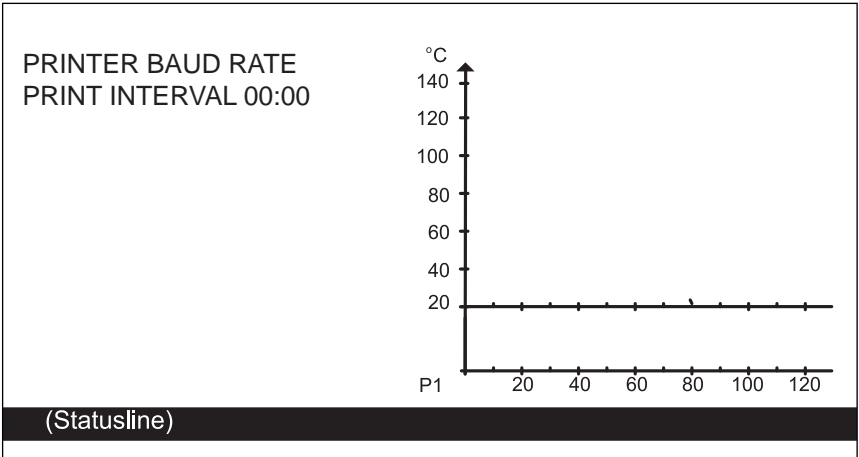
PRINTER BAUD RATE   Pressing **[ENTER]** on the selected field will activate the selection. The baud rate options are 300, 1200, 2400, 4800, 9600, and 19200. Use ▲ or ▼ and press **[ENTER]** to make selection.

PRINT INTERVAL 00:00   This option allows actual data to be printed out via RS232 port at an interval specified by the user.

DOSE VERIFICATION
RINSE   0ml
DRAIN   0ml
CALIBRATE

°C
140
120
100
80
60
40
20

P1   20   40   60   80   100 120

(Statusline)
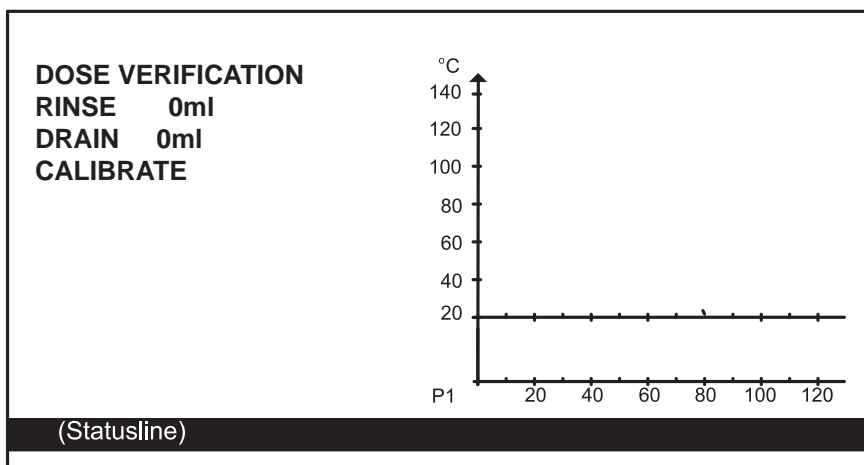
DOSE VERIFICATION   Menu to verify calibration result. Enter desired
                               volume and press [Enter].

                               DOS VOL 0.0ml
                               EXECUTE

RINSE   0ml   Used for rinsing dosing tube or fill (prime) the tube
                               with water. After entering the desired volume and
                               pressing [Enter], a confirmation menu will appear.

> **TIP:** *Always perform this rinse at the end of the day. This action will
> prevent chemicals from crystalizing in the dosing tubes and
> dosing pump diaphragm thus prolonging the life of the dosing
> pump.*

DRAIN   0ml   Used for draining the remaining liquid in the tube.
                               Key in the desired volume and press [Enter]. The
                               total volume in the tube is approximately 6ml.

CALIBRATE   Menu for calibrating the dosing pump.

> **TIP:** *If more than one dosing is in a process, select one solution for
> calibration. However during   Dose Verification   as above, test all
> dosing solutions for accuracy. There may be a slight difference
> in the volume due to solution concentration and viscosity. If the
> difference is out of the required tolerance, adjust the dosing
> volume during programming to compensate.*

```
BUZZER PROG END    _          °C
BUZZER SAFETYBOND  _        140
OFFS.  SEN    +_._°C        120
MAX. FILL        XXXX ml    100
CALL WATER FLOW             80
PASSWORD SETUP             60
LANGUAGE                   40
                           20

                           P1    20  40  60  80  100  120
   (Statusline)
```
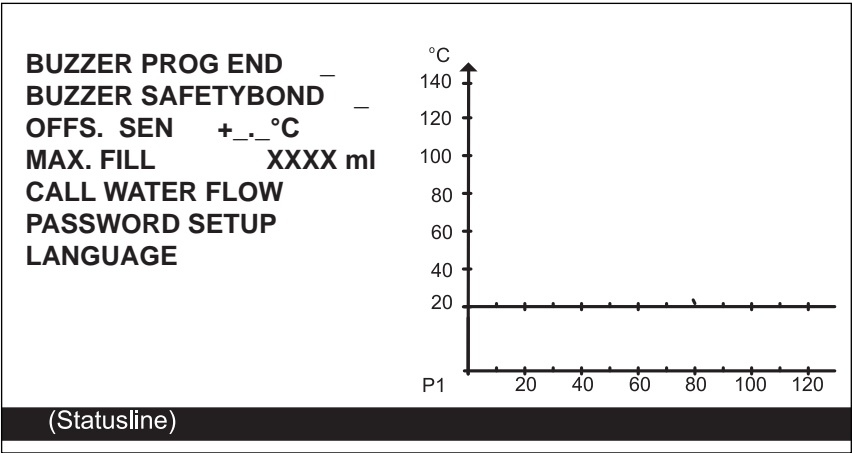
Buzzer ProgEnd _   Set "Beep duration" at end of program.
                                  Input value 0 = 15 sec. "Beep"
                                  Input value 1 = 15 min. "Beep"

Buzzer SafetyBond   Beep alarm when the temperature is out of tolerance
                                  0 = OFF, 1 = ON.

Offs. Sen. +_._°C   Recalibration of the offset temperature. Input in +/-
                                  10.0 °C.

MAX. FILL xxxx ml   Sets maximum water fill in the beaker.

CAL WATER FLOW   Calibrating water flow meter. To ensure accuracy,
                                  calibrate at leat every six months.

PASSWORD SETUP   Installing a password will prevent accidental deleting
                                  of programs in the controller memory or memory
                                  card.

LANGUAGE   Changing menu text from english to a different a
                                  available language. See appendix 6.

Display Info	Description	Action
Restricted access	**Limmited data that can be edited during the program.**	**Stay within the limits**
New program	**Program to be edited will be created as new.**	**N/A**
Old program	**Program to be edited exists**	**N/A**
Memory full	**No further programming steps available.**	**Note the maximum allowable program size.**
Program non-existing	**Program does not exist.**	**N/A**
Program existing	**Program can not be copied because target program exists.**	**Select a new memory position.**
Program busy	**Program is currently being executed. Editing is not possible.**	**Wait for program to end or exit existing program.**
MEMORY CARD READ ONLY.	**Memory card is write protected. (see back of memory card)**	**Insert the memory card without write protection.**
INSERT MEMORY CARD	**No memory card inserted**	**Insert memory card**
PRINTER BUSY	**Program is currently printing and can not be started yet.**	**Wait for end of printing.**
Printer not ready	**Printer is not connected, turned off, out of paper**	**Reset printer**
Invalid value in step _	**Value entered is out of limit or not valid**	**Re-enter correct value**
Found lost programs	**Controller information message**	**"Info" only**

Empty Database	There is no program in memory or all programs have been deleted	3)
Incorrect Password	Incorrect password	Re-enter password
Invalid Memory Card - Incompatible Memory Card	Wrong memory card size (should be 256k)	Use correct memory card
Unknown Fault	Controller internal failure	1)
Please wait....	Program is loading	Wait for program to load
Completed	Process is done	"Info only"

1) Press [**POWER**] - wait 10 sec. - press [**POWER**] - O.K. ? - If the problem is not solved consult Datacolor "Ahiba" customer service. The nearest office can be found through the "Datacolor Worldwide Office Locator" at www.datacolor.com, or by contacting Datacolor Corporate Headquarters (609) 924-2189, and asking for customer support or email Hwsupport@datacolor.com.

2) Continue the process by pressing [**CONTINUE**] or cancel by pressing [**END**].

3) Press [**ALARM RESET**] key.

Display Info	Description	Action
STATUS ERROR	**Internal fault in the controller.**	**1)**
PARAMETER FAILURE	**EEPROM parameter not OK or lost. Parameters must first be programmed.**	**1)**
DATABASE FAILURE	**Program memory error, all programs have been deleted.**	**3)**
HIGH TEMPERATURE	**Temperature is too high. The monitor controller has been triggered. Heater is turned off.**	**1)**
PWR FAILURE AT hh:mm	**Prower outage exceeds 2 minutes.**	**2)**
FLOW MOTOR FAILURE	**Controller does not detect motor movement.**	**1)**
PT100 FAILURE	**Temperature sensor failed.**	**Replace sensor or 1)**
Tist OUT OF RANGE.	**Temperature monitoring has tripped.**	**"INFO"**
STACK UNDERFLOW	**Internal program error.**	**1)**
LOW BATTERY	**Battery low. Programs can be lost.**	**Save the programs and call Datacolor customer support.**
Press Esc or goto RUN menu	**Expecting user action to continue dosing operation.**	**Follow instructions on the display.**
Process held	**Undefined error**	**1)**
WATER FLOW FAILURE	**Controller does not receive motor signal**	**1)**

Protection

Excess Temperature

As soon as the dye chamber sensor registers a temperature in excess of 140°C, the heater is shut off automatically and cooling water starts flowing.

Excess Pressure

An automatic pressure relief valve inside the unit is set to automatically release pressure at 5 bar ± 0.5 bar.
A manual pressure relief valve located in front of the beaker may be activated by pushing down the button. It will release excess pressure to the drain manifold.

| i | Before opening a beaker lid, hold down the manual pressure relief valve and watch the pressure gauge on the front of the unit. Make sure the pressure reading is at "0" before opening the beaker lid. |

Glass Protection

The dye chamber is protected by inside and outside lexan protective tubing. The inside protective tube must not be removed from the beaker. The outside protective tubing must remain installed if dyeing is done under pressure or if dyeing temperature is above 85°C (185°F).

Maintenance

Dye chamber

Rinse the dye beaker thoroughly after each processing action.

Datacolor does not recommend using brushes for manual cleaning, since brush hairs may become stuck in the drain valve resulting in leaks in the system.

Outer Casings

The outer skins of the Ahiba Multiprecise TC are made of stainless steel . Use a mild, non-abrasive detergent or glass cleaner to clean any spills that mat occur

Front Display Panel

The front display panel is a powder coated stainless steel. Use a mild, non-abrasive detergent or glass cleaner to clean any spills that occur. Extra care should be taken in this area due to electronics.

Dismantling the Body of the Pump

There may be two reasons why the body of the pump may have to be dismantled.

a) Cleaning of individual parts

b) Replacement of worn parts

To do so, use a slotted screwdriver or a coin to undo the bearing neck (1). Following this, bearing disk (5), impeller (6) and magnet (7) may be removed from the body of the pump (3). Remove the bearing nut (4) by rotating it counterclockwise from the side socket (2).
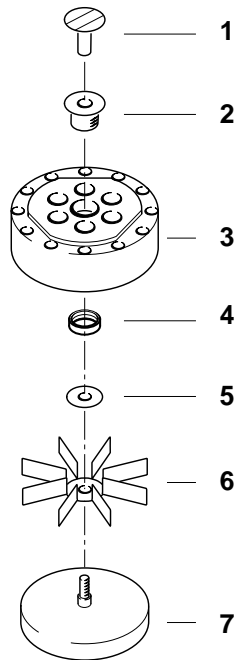
Replace Glass

1. Drain dye chamber
   (function DRAIN)

2. Remove protective glass (1) by pulling it
   up.

3. Use 6mm socket wrench and remove the
   4 csk. hex socket screws (2) on the flange
   (3) above the glass cylinder.

4. Remove inside protective glass (4) by
   pulling it up.

5. Remove beaker glass (5) by pulling it up.

6. Replace glass and two seals and center
   it on the edge of the thermal bowl.
   Re-install inner protective glass.

7. Re-install outside protective glass
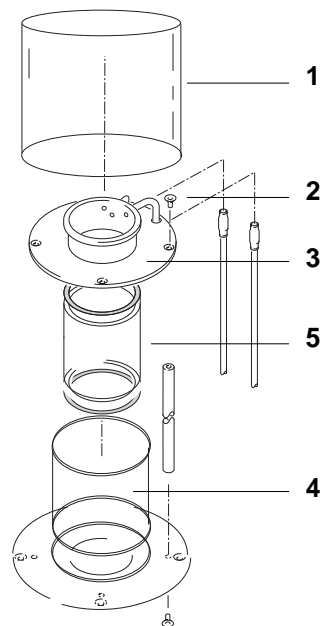
Leak Test

If any element has been replaced, proceed as follow:

- Fill dye container up to the level of the upper glass seal.

- Close the lid and build up pressure to 3 bar (function PRESSURE).

⚠ For safety reasons, leak test may be performed only in dye chamber filled with water.

The inside and outside protective glass must be in place.

- For approximately 3 minutes, check the pressure gauge on the front of the unit. If a loss of pressure or a leak in the dye chamber is obvious, the dye chamber (mounting, glass, seals) must be checked and replaced if necessary).

Maintenance List

Legend: U = User
                   S = DCI Service Support

		After Use	Quarterly	Yearly
Accessories Wash thoroughly.	U	X		
Machine Keep the exterior surfaces clean	U	X		
Dyeing Chamber Check for leaks and cracks in glass. Replace seals or glass if necessary	U	X		
Cooling Water Inlet, Warm Water Inlet, and drain Check that tubing is securely fastened onto plumbing nipples.	U		X	
Lid Check o-ring, ensure lid seals properly, check for leaks If necessary, replace o-ring.	U	X		
Manual Pressure Relief Valve With pressure in chamber press button and ensure gauge drops pressure. Adjust check valve if necessary.	S			X
Internal Plumbing Check for leaks.	S			X
Water Flow Meter	S			X
Dyeing Beaker Temperature Calibration Check the beaker temperature and adjust if necessary. Use calibrated temperature sensor.	S			X
Dosing Pump Check for leaks. Check calibration sing calibrated beaker tubes.	S			X
Dosing Tubes Rinse with warm water.	U	X		

Appendices

```
     Main Menu                Edit Program Menu

┌──────────────────────┐    ┌──────────────────────┐      ┌──────────────────────┐
│ EDIT PROGRAM         │───▶│ DIR PROGRAMS         │      │ PRORAM NAME:         │
│ RUN PROGRAM          │    │ EDIT PROGRAM No.__   │─────▶│ XXXXXXXXXXXXXXXXX    │
│ MANUAL MODE          │    │ DEL PROGRAM   No.__  │      │ 01 TEMP   +___._°C   │
│ DATA                 │    │ DEL ALL PROGRAMS     │      │ 01 GRAD +_._°C/min   │
│ DATA & OVERVIEW      │    │ PRINT PROG   No.__   │      │ 01 TIME     ___ min  │
│ CONFIGURATION        │    │ COPY PROGRAM         │      │ 01 FLOW      ___%    │
└──────────────────────┘    │ DIR MEM CARD         │      │ 01 HOLD       _      │
                            │ LOAD FROM MEM CARD   │      │ 01 DOSAGE   2 PRGR   │
                            │ SAVE TO MEM CARD     │      │ 01 DOS PROGR  50%    │
                            │ DEL MEM CARD PRG__   │      │ 01 DOS START _min    │
                            │ DEL ALL MEM CARD     │      │ 01 DOS VOL    _ml     │
                            └──────────────────────┘      │ 01 DOS TIME   _min   │
                                                          │ ADD NEW PROCESS      │
┌──────────────────────┐    ┌──────────────────────┐      │ ADD NEW FUNCTION     │
│ PROG M-CARD   No.__  │    │ COPY PROG   No.__    │      │ INSERT PROCESS 0     │
│ PROGRAM       No.__  │    │ DESTINATION No.__    │      │ INSERT FUNCTION 0    │
│ LOAD FROM MEM CARD   │    │ COPY PROGRAM         │      │ DEL LAST STEP        │
└──────────────────────┘    └──────────────────────┘      │ DEL STEP 0           │
                                                          │ END                  │
┌──────────────────────┐    ┌──────────────────────┐      └──────────────────────┘
│ PROGRAM       No.__  │    │ PRINT PROG  No.__    │
│ PROG M-CARD   No.__  │    │ Yes, press [Enter]   │      ┌──────────────────────┐
│ SAVE TO MEM CARD     │    │ No,  press [ESC]     │      │ DEL PROGRAM No.__    │
└──────────────────────┘    └──────────────────────┘      │ Yes, press [Enter]   │
                                                          │ No,  press [ESC]     │
┌──────────────────────┐                                  └──────────────────────┘
│ DEL MEM CARD PROG __ │
│ Yes, press [Enter]   │                                  ┌──────────────────────┐
│ No,  press [ESC]     │                                  │ DEL ALL PROGRAMS     │
└──────────────────────┘                                  │ Yes, press [Enter]   │
                                                          │ No,  press [ESC]     │
┌──────────────────────┐                                  └──────────────────────┘
│ DEL ALL MEM CARD     │
│ Yes, press [Enter]   │
│ No,  press [ESC]     │
└──────────────────────┘
```

Main Menu

```
EDIT PROGRAM
RUN PROGRAM
MANUAL MODE
DATA
DATA & OVERVIEW
CONFIGURATION
```

See Appendix 5

Run Program Menu

```
RUN PROGRAM No.___
DELAYED RUN No.___
DATA & OVERVIEW
DATA
```

```
END PROG No.___
Yes, press [Enter]
No,  press [ESC]
```

```
Enter time:
MM-DD-YYYY hh:mm
RUN PROG    No.___
```

See Appendix 4

```
HOLD PROG No.___
Yes, press [Enter]
No,  press [ESC]
```

```
CONT PROG No.___
Yes, press [Enter]
No,  press [ESC]
```

```
RUN STEP    No.___
RUN PROGRAM No.___
```

```
DATA & OVERVIEW
DATA
END
HOLD - CONTINUE
```

See Appendix 5

```
              Main Menu
       ┌────────────────────┐
       │ EDIT PROGRAM       │
       │ RUN PROGRAM        │              Manual Mode Menu
       │ MANUAL MODE        │         ┌────────────────────────┐      ┌────────────────────────┐
       │ DATA               │────────▶│ MANUAL PROCESS         │─────▶│ TEMP    +___._ °C      │
       │ DATA & OVERVIEW    │         │ MANUAL FUNCTION        │      │ GRAD    +_._°C/min     │
       │ CONFIGURATION      │         └────────────────────────┘      │ TIME       ___ min     │
       └────────────────────┘                 │                       │ FLOW        ___%       │
                                              │                       │ DOSAGE    2 PROG       │
       ┌────────────────────┐                 │                       │ DOS PROGR    __%       │
       │ FILL CW     0ml    │◀────────────────┘                       │ DOS START  __min       │
       │ FILL WW     0ml    │                                         │ DOS VOL     __ml       │
       │ RINSE CW    0ml    │                                         │ DOS TIME   __min       │
       │ RINSE WW    0ml    │                                         │ RUN PROCESS            │
       │ VACUUM    0sec     │                                         │ END PROCESS            │
       │ PRESSURE  0sec     │              See Appendix 4     ◀───────│ DATA                   │
       │ DRAIN     0sec     │                                         └────────────────────────┘
       │ END FUNCTION       │
       └────────────────────┘
```

Main Menu

```
EDIT PROGRAM
RUN PROGRAM
MANUAL MODE
DATA
DATA & OVERVIEW
CONFIGURATION
```

No Running Process

```
Tis              +_
```

Automatic Process

```
new
Tis    +___._°C
Tset   +___._°C
TIME       ___min
GRAD +_._°C/min
POWER   +/-___%
FLOW         __%
HOLD          _
DOSAGE   2 PROG
DOS PROGR   __%
DOS START __min
DOS VOL    __ml
DOS TIME  __min
START TIME
 MM-DD-YYYY hh:mm
PROGRAM  No.__
STEP     No.__
```

Manual Process

```
Tis     +___._°C
Tset    +___._°C
TIME       ___min
GRAD  +_._°C/min
POWER    +___%
FLOW        __%
HOLD         _
DOSAGE    1 LIN
DOS START __min
DOS VOL    __ml
DOS TIME  __min
START TIME
 MM-DD-YYYY hh:mm
```

Main Menu

EDIT PROGRAM
RUN PROGRAM
MANUAL MODE
DATA
DATA & OVERVIEW
CONFIGURATION

No Process Running

120.0° END

Manual/Automatic Process

120.0° 180 min

```
Main Menu

EDIT PROGRAM
RUN PROGRAM
MANUAL MODE
DATA
DATA & OVERVIEW
CONFIGURATION
```

```
Configuration Menu

SET TIME
COMMUNICATION
DOSAGE
USER SETUP
INSTALLATION
```

```
SET TIME

02-08-2000    13:26
MM-DD-YYYY   hh:mm
```

```
PRINTER TYPE
PRINTER BAUDRATE
PRINT INTERVAL00:00
```

```
Epson Fx80    _
HP DeskJet    _
[ENTER] = select
```

```
300 BAUD   _
1200 BAUD  _
2400 BAUD  _
4800 BAUD  _
9600 BAUD  _
19200 BAUD _
[ENTER] = select
```

```
See Appendix 7
```

```
Access Restricted to
DCI Personnel Only
```

```
PULSES/ltr  2220
EXECUTE
```

```
Buzzer ProgEnd     _
Buzzer SafetyBond  _
Offs. Sen.  +_._°C
CAL WATER FLOW
PASSWORD SETUP
LANGUAGE
```

```
NEW PASSWORD  _ _ _ _
RE-ENTER NEW  _ _ _ _
```

```
LANGUAGE
English    [Enter]
Deutsch    [Enter]
Francais   [Enter]
Italiano   [Enter]
Espanol    [Enter]
Portuges   [Enter]
```

```
When exiting
User Setup
```

```
SAVE PARAMETERS
Yes, press [Enter]
No,  press [ESC]
```

```
      Configuration Menu
 ┌──────────────────────┐        ┌──────────────────────┐        ┌──────────────────────┐
 │SET TIME              │        │DOSE VERIFICATION     │        │DOS VOL    0.0ml      │
 │COMMUNICATION         │        │                      │        │                      │
 │**DOSAGE**            │───────►│RINSE        0ml      │───────►│EXECUTE               │
 │USER SETUP            │        │DRAIN        0ml      │        └──────────────────────┘
 │INSTALLATION          │        │CALIBRATE             │
 └──────────────────────┘        └──────────────────────┘

 ┌──────────────────────┐                                        ┌──────────────────────┐
 │DRAIN        __ml     │◄───                                    │RINSE        __ml     │
 │Yes, press[Enter]     │                                        │Yes, press[Enter]     │
 │No,  press  [ESC]     │                                        │No,  press  [ESC]     │
 └──────────────────────┘                                        └──────────────────────┘

 ┌──────────────────────┐
 │CALIBRATE   __.__ml   │◄───
 │MEASURED   __.__ml    │
 └──────────────────────┘
```