datacolor

Ahiba IR

USER'S GUIDE

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Ahiba IR User's Guide
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Contents

Ahiba IR

Overview

Ahiba IR is an infrared dyeing machine that handles a wide variety of processes in exhaust dyeing laboratories. It can be used as an atmospheric or high-temperature dyer. The unit can also be used to simulate wash fastness testing.

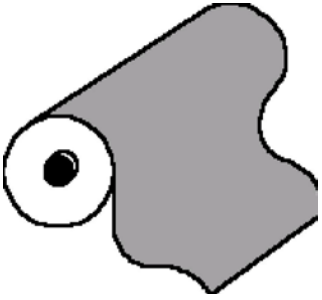
The Ahiba IR controller includes software that is used to program customized temperature/time sequences. Microprocessor technology ensures that the controller accurately follows the pre-defined dyeing curves.

The user interface employs a symbol-driven interface that removes all translation obstacles that exist with text-driven interface designs. A numeric keypad completes the data entry tools.

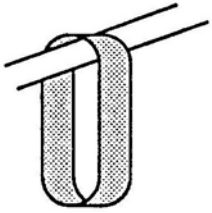
Features

- **Heating Source:** 3 1000W infrared quartz lamps.
- **Cooling Source:** Fresh air pulled into the unit via a CFM blower. Expelled through an exhaust channel on the back of the unit.
- **Temperature Monitoring:** Protects the equipment and samples from overheating.
- **Type of Fibers:** All fibers
- **Dyeing Positions:** Accommodates up to 20 dyeing positions
- **Types of Substrates:**

Piece

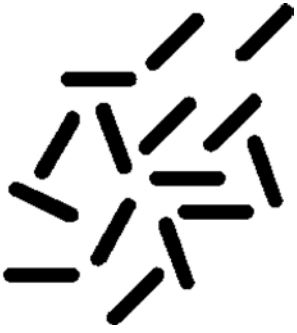


Hank



Combed Slivers

Loose Material



- **Liquor Ratio:**
  1:3 (Synthetics)
  1:5 (Natural)
- **Wash Fastness Testing.** Unit can also be used to simulate wash fastness testing.
- **User Interface:** Symbol-driven user interface. Maximum number of custom programs stored is 99, each containing a maximum of 15 steps.

Accessories

Standard Accessories

The following accessories are included with the system:

- Hex screwdriver for tightening and loosening beaker tops
- Reference beaker
- Complete set of beakers. Note: If optional dosing beakers are ordered, all necessary accessories to complete the dosing process will be included.
- Replacement set of o-rings for beaker lids
- Spare bayonet sensor
- Printed user's guide

Optional Accessories

Optional accessories for the Ahiba IR include the following:

- Beaker preparation basket
- Self-refilling dosing syringe
- Accessories for membrane dosing
- Accessories for injection dosing

These accessories can be ordered with the system, or ordered at a later time. *See also Appendix, Accessories List for details to order these accessories.*

About the Beakers

The Ahiba IR can work with several different beaker sizes. A standard unit includes a single set of beakers, and the beaker size is defined when the order is placed. The table below summarizes this information:

Beaker Size (Maximum)	Maximum Number of beakers that can fit into the unit	Ideal Sample Size
150 ml	20	5 grams
300 ml	15	10 grams
500 ml	8	25 grams
500 ml	10	25 grams
1000 ml	8	50 grams
5 liter	1	250 grams

INFORMATION

A unit can be equipped with either dosing or non-dosing beakers. Injection dosing or membrane dosing beakers are available.

Units equipped with a 5L drum should limit the heating gradient input to 2.5°C/min, this due to the mass of the beaker and to prevent “Temperature out of Range” errors.

A unit fitted with either dosing option will include all accessories required to accomplish the dosing (e.g. 10cc self-refilling dosing syringe, dosing adapter or needle pack).

The ideal sample size is based on 10:1 liquor ratio. The maximum fill volume of the beaker should be limited to less than 2/3 of the total beaker volume, to achieve maximum agitation of the sample and dyebath inside the beaker.

The number of beakers supplied is based on the number of dyeing positions ordered with the unit.

See also Appendix, Optional Accessories in this guide for a complete list of optional accessories.

Safety Labels and Precautions

The following symbols are found on the equipment and in the documentation:

Do Not Touch

Surface is Hot. There is a danger of burn injuries in the operation of this unit.

High Voltage

Hot Air Exhaust

Stop. Warning that a specific action is prohibited.

CAUTION. When this appears in the documentation, it indicates that the step to be performed requires precautions.

INFORMATION. Indicates there is additional information relevant to the topic..

The precautions below should always be considered during the unit assembly, operation and maintenance.

General Precautions

- The equipment shall only be operated as instructed in this guide. If equipment is used in a manner other than that specified in this document, the protection provided by this instrument may be impaired.
- Read this user's guide carefully before placing the unit in service.
- This unit weighs 73kg. Any movement or relocation of the unit requires a minimum of four persons.

Electrical/Environmental Precautions

- To prevent an electrical shock or fire, be sure to use the power cord supplied by Datacolor.
- The power cord must be plugged into an outlet with a protective grounding terminal. Do not invalidate protection by using an extension cord without protective grounding.

CAUTION

Turn main power switch to **OFF** and remove the power cord from the electrical outlet before any internal service work is done.

Use Precautions

- Unit is to be used only as laboratory dyeing equipment.
- Continue operating only as long as the unit functions properly.
- Units equipped with a 5L drum should limit the heating gradient input to 2.5°C/min, this due to the mass of the beaker and to prevent "Temperature out of Range" errors.
- Certain internal parts may reach a temperature greater than 50°C/122°F. Unit can only be operated when the door is closed.

CAUTION

When door is opened, internal parts should only be handled after the unit has *cooled to* 50° C.

Maintenance Precautions

- Unit should be operated, maintained and repaired only by authorized, trained personnel.
- Careful cleaning of the unit enhances the reliability and extends the life of the equipment.

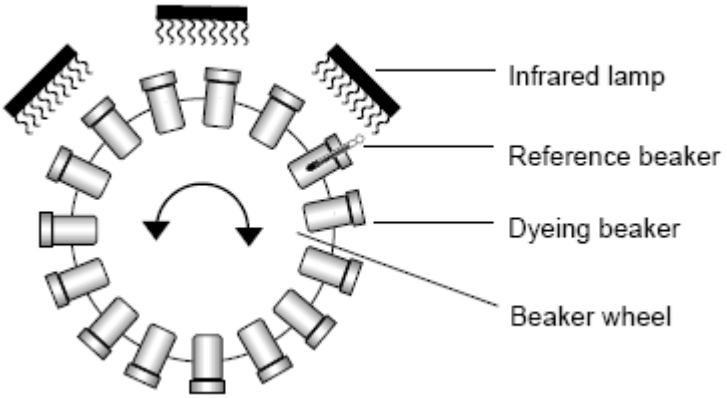
Chemical Handling Precautions

- Always observe the standards and regulations applicable to the chemicals being used.
- Datacolor assumes no responsibility for the handling of chemicals.

Operating Principles

Ahiba IR consists of a rotating wheel that accommodates a maximum of 20 beakers. The unit employs a radiant infra-red heating technology to heat the liquor in the beakers, and uses an air-cooling system. This design reduces energy consumption while providing temperature control and accuracy.

Heating and Cooling Schematic

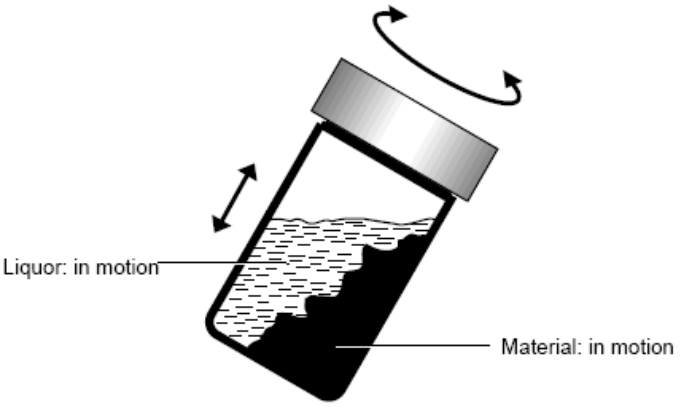


- Three (3) high-performance infrared lamps are used to heat the beakers. They are mounted at the top of the unit. The heat is transferred from the beaker to the dyebath liquor.
- The design of the beakers ensures accurate beaker-to-beaker temperatures.
- A reference beaker fitted with a temperature sensor is used to measure the dyebath temperature. The actual temperature is reported to the controller via a rotary switch.
- A high CFM blower fan is used to draw fresh air into the chamber, to cool the beakers. The hot air is released through an exhaust channel

at the back of the unit. The fan is cycled on and off as needed to regulate the temperature.

- A multiple back-up safety system monitors the temperature and protects the equipment and samples from overheating.

Beaker Rotation



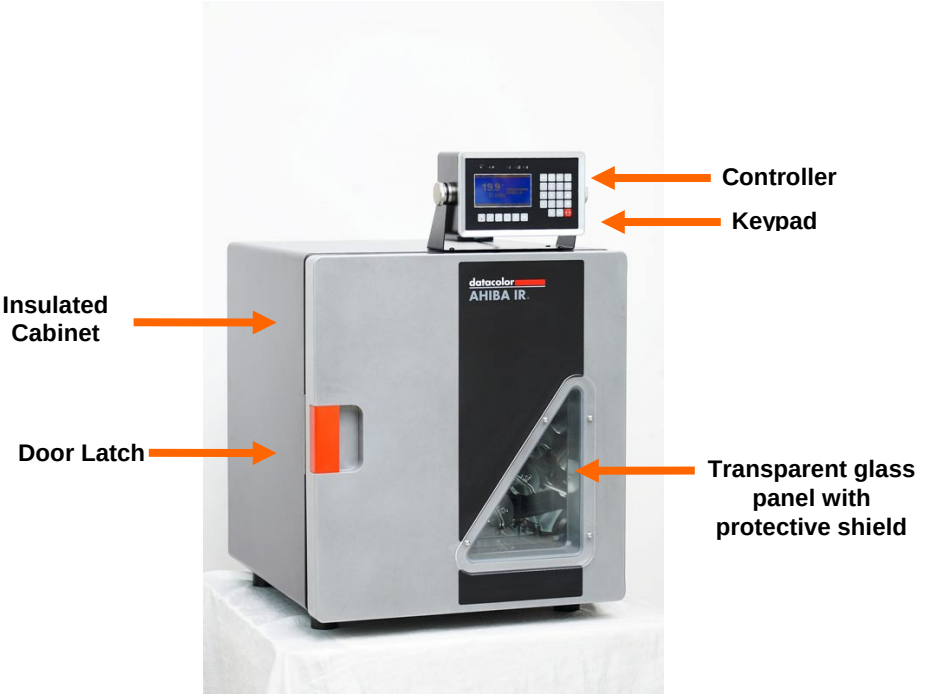
- **Rotation Speed:** 5 – 50 rpm (variable)
- **Beaker Movement:** Automatically reverses wheel direction every minute

Equipment Controls and Indicators

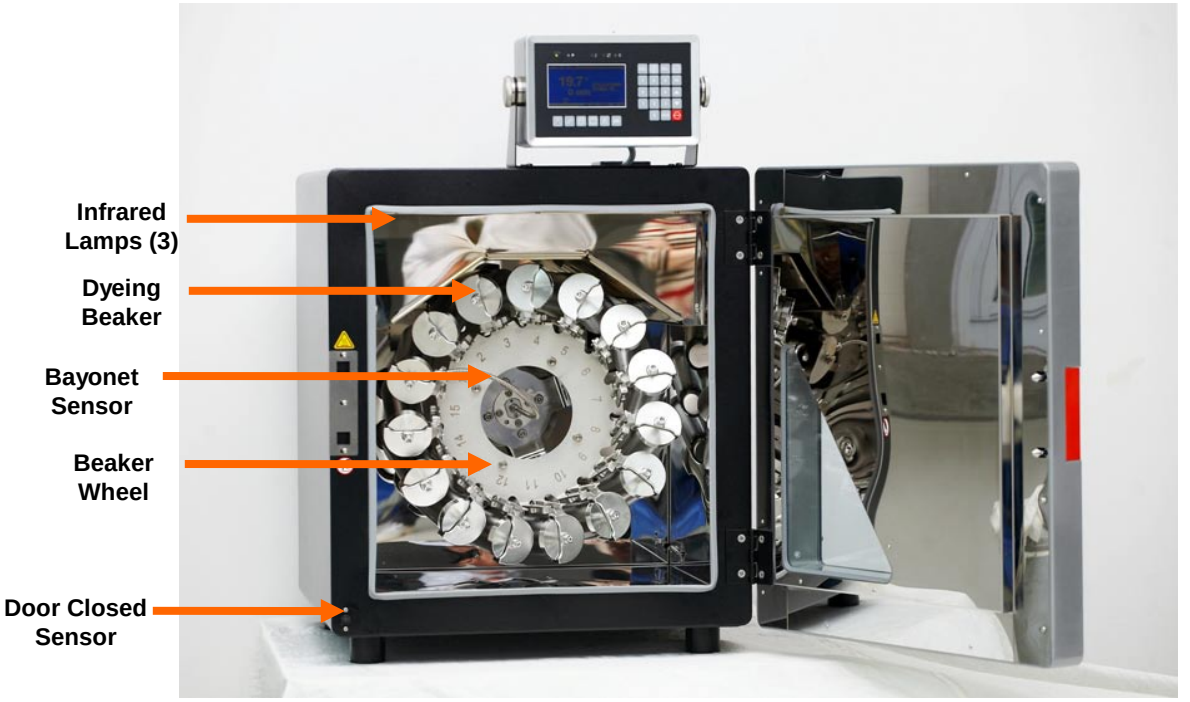
Overview

This section itemizes all of the controls and indicators included on the Ahiba IR.

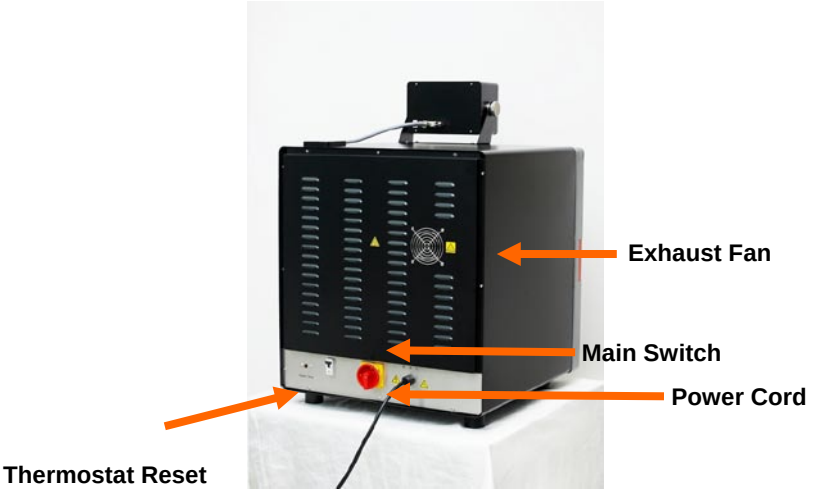
Front of Unit



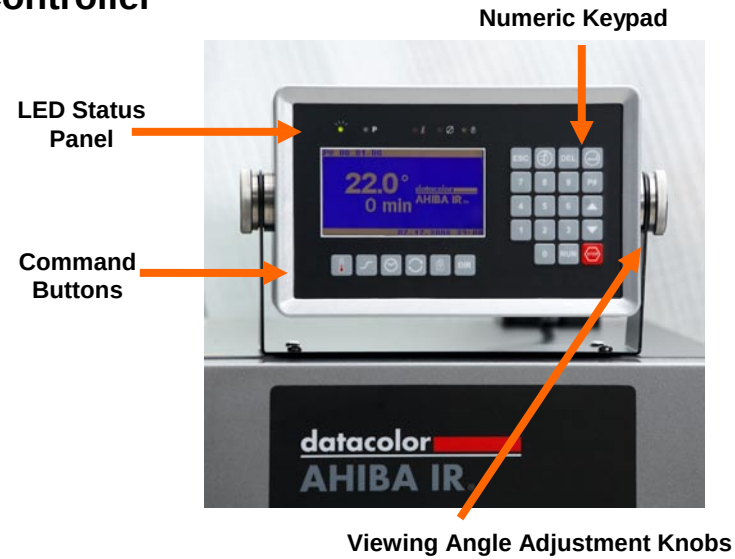
Inside of Unit



Back of Unit



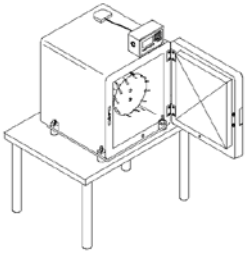
Controller



System Setup and Maintenance

The steps required to prepare the unit for operation include:

- Select a location
- Mount the controller to the machine (hardware provided)
- Connect main communication cable to the controller
- Connect unit to power source
- Beaker installation



System Location

The Ahiba IR should be placed on a stable, level table. The table should have sufficient height to allow for easy opening and closing of the door, and easy viewing of the controller.

CAUTION
There should be a minimum of 6 inches (152mm) between the back of the unit and the wall or any other obstacles, for proper venting of exhaust port.

Power Connections

The controller and the Ahiba IR unit have separate power controls.

Main Power Connection

You must connect the power cord to the unit, and to an electrical outlet.

CAUTION
The power connection should be made by a certified electrician.

INFORMATION
Prior to connecting the Ahiba IR unit, ensure that the local line voltage agrees with the line voltage specified on the name plate. *See also Main Power Supply Connection below for schematics.*

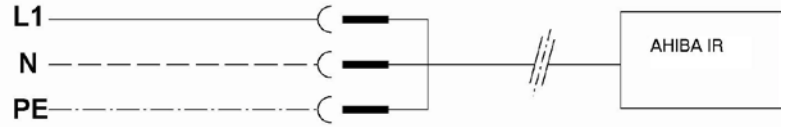
The Ahiba IR requires a proper earth ground.

Main Power Supply Connection

Below are the power connections that can be used.

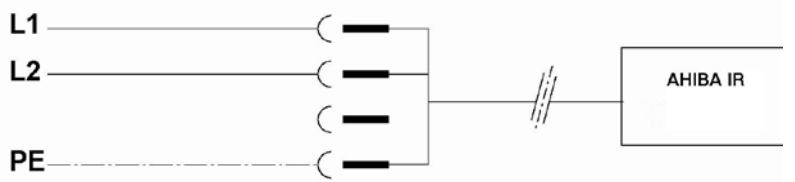
230V AC standard mains *(e.g., Europe)*

230V AC, 1N/PE, 50/60 Hz, 3850 W; Fuse: 15 A



230V AC high power mains *(e.g., US, Canada, Japan)*

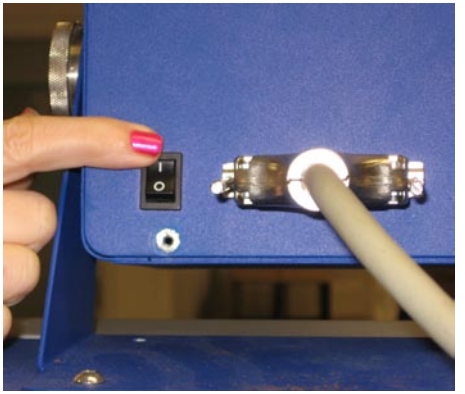
230V AC, 2/PE, 50/60 Hz, 3850 W; Fuse: 15 A



Controller Power Supply

The Ahiba IR controller is powered separately from the machine. Before turning the controller on, check that the power connection from the main power cord is completed and checked for correct voltage levels. When you have verified the connection:

1. Turn on the main power switch located on the back of unit.
2. Locate the controller power switch on the rear of the controller box:



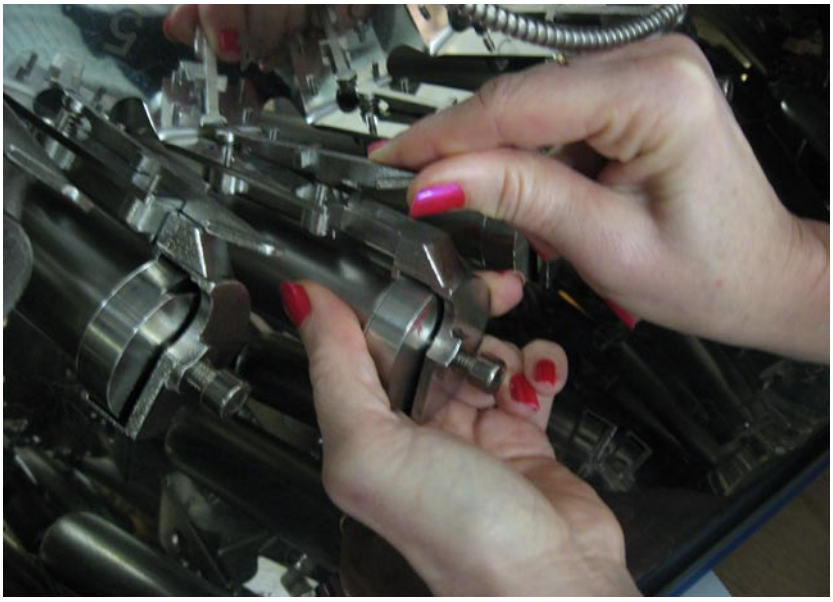
3. Press the top of the button to activate the controller. Press the bottom of the button to cut the power to the controller.

Beaker Preparation, Cleaning and Maintenance

Beaker Installation

The beaker wheel is fitted with a simple mechanical latching system to lock the beakers in place on the wheel. Beaker installation includes the following steps:

- Secure beaker lids. This is done each time a dyeing process is run.
- Install beakers
- Install/connect reference beaker



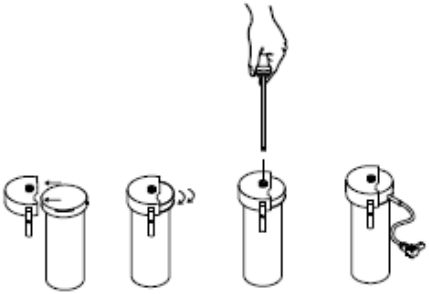
All of the steps described below must be performed for each dyeing cycle.

Securing the Beaker Lids

Before the beakers are attached to the wheel, the lids must be secured using the hex screwdriver supplied with the unit. To secure the lids:

1. Ensure beaker lid and beaker flange are a smooth and even seal.

2. Tighten the dog point socket head screws using the hex screwdriver provided with the unit.



CAUTION

Do not replace hex screwdriver with a hex key.

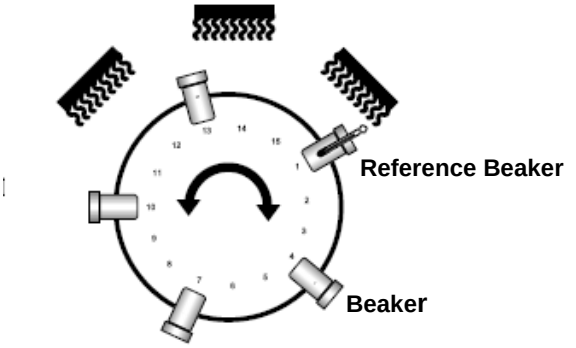
This will cause the lid to be over tightened.

3. Install the beakers on the wheel.

Use the following guidelines when installing the beakers on the wheel:

- Do not mix beaker sizes in a single process. All beakers loaded on the wheel must be the same size.
- The Ahiba IR uses custom designed pressure-tested beakers. The seal between the beaker and the lid is accomplished with an o-ring seal. This o-ring is a maintenance part and additional o-rings are supplied with the unit.
- Over tightening of the beaker will damage the o-ring and cause damage to the lid. If additional tightening is required to ensure the seal, it is time to replace the o-rings. *See also Appendix, System Maintenance for the maintenance schedule.*

- The beakers should be distributed evenly around the wheel. Do not overload one section of the wheel with the beakers (see diagram below).



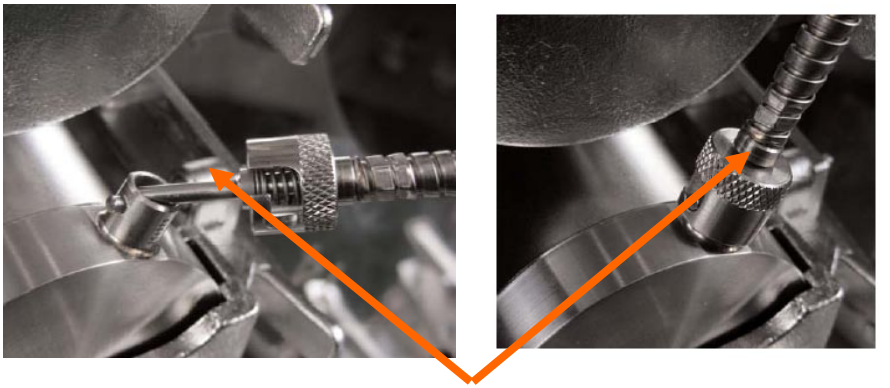
- All beakers must have the same liquor volume.
- All beakers should be the same approximate temperature as the reference beaker.

See also Appendix, Beaker Loads for minimum and maximum beaker load specifications.

Beaker Connections

Below are some guidelines to consider when connecting a beaker to the wheel:

- The sensor lead is connected and locked to the beaker by the rotating collar of the sensor.
- Continue turning the collar until the connection is locked.
- To insure that the cable is locked to the beaker lid, pull on it slightly.



INFORMATION

The reference beaker ALWAYS serves as a dyeing beaker. This ensures that all beakers have the same volume, and begin the process at the same temperature, and will result in accurate, repeatable dyeings.

Temperature Sensor Cable

The Bayonet PT-100 temperature sensor cable should remain connected to the machine at all times. The only reason for removal is for defect, and it must be replaced.

INFORMATION

The temperature sensor cable is plugged into the center of the drive shaft. It is secured by a holding clamp. This prevents accidental disconnection of the sensor from the plug.

The sensor should be connected to the reference beaker before installing the beaker on the beaker wheel. It should be removed prior to removing the reference beaker when the dyeing is completed.

CAUTIONS

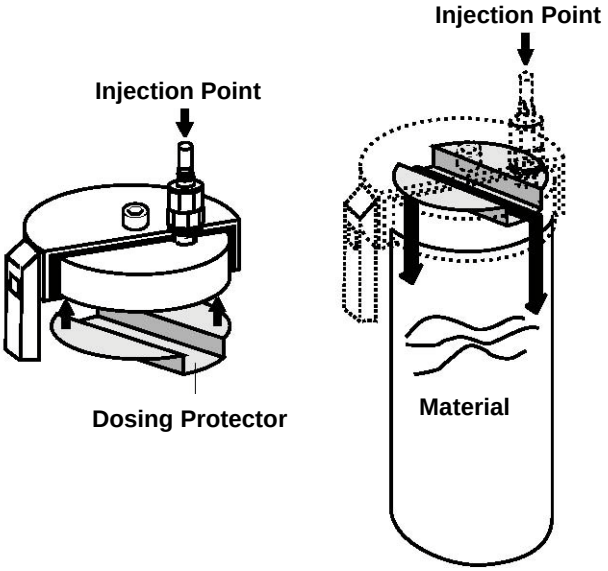
- Avoid pulling hard on the temperature sensor cable.
- Avoid wetting the temperature sensor cable with water.
- The reference beaker lid can be heated to a maximum of 140°C (284°F)
- Do not connect the temperature sensor cable to the reference beaker lid until the lid is completely dry.

Beaker Dosing

The Ahiba IR can be ordered with custom beaker lids that allow you to inject liquid chemicals into the beakers during the dyeing process. Dosing is done using a self-refilling, manual dosing syringe, an optional accessory available with the unit.

All dosing beakers are fitted with a dosing protector that diffuses the flow of the liquor onto the substrate. This prevents the chemical from coming into direct contact with the substrate.

Below are drawings of the installation of the dosing protector:



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INFORMATION

When dosing a beaker, the liquid chemical being dosed should not come into direct contact with the substrate. All dosing beakers are fitted with a dosing protector, which diffuses the flow of the liquor onto the substrate. This prevents the substrate from being directly contacted with the chemical.

Thoroughly rinse the injection nipples with warm water after each use. This cleans the working parts, extends the life of the seals and prevents clogging due to dried chemicals.

Self-Refilling Dosing Syringe

A self-refilling dosing syringe can be used with Ahiba IR. *See also Appendix, Accessories, Dosing Syringe Accessories for details on replacement parts.*

Beaker Preparation Basket

An optional beaker preparation basket is available with the unit. If this is included with your unit, you must assemble it. *See also, Accessories, Beaker Preparation Basket for a picture.*

Beaker Cleaning and Maintenance

All beakers must be removed and cleaned after each dye cycle. In most cases cleaning with water after each dye cycle should be sufficient. However if dyestuff is still present, a chemical cleaning should be performed to remove and residual dyestuff remaining in the beaker. The beakers, lids and brackets can be cleaned in a washing machine (e.g. glass washing machine, ultrasonic cleaner, etc.)

All beaker lid o-rings should be inspected prior to use and replaced if any sign of wear such as flattening, tears or cuts are observed. *See also Appendix, Maintenance Schedule for maintenance information.*

NOTES

Program Controls

Overview

The Ahiba IR employs a simple user interface that communicates programming and system information, using internationally-recognized symbols and icons. Because of this design, Ahiba IR employs a limited number of screens which reduces the amount of user training required to operate the equipment.

An LED status bar visually displays important information about the process. The controller also has a variable audible alarm system that alerts the operator to the conditions and status of the process. Sophisticated firmware runs monitoring and controls in the background, ensuring the proper operation and control of the process. When an error occurs, the controller communicates the error via icons, audible alarms and LED status lights.

The Ahiba IR works with stored programs that contain customized time and temperature dyeing sequences. The unit can hold a maximum of 99 programs, each having a maximum of 15 steps. A stored program remains in the system memory until it is deleted by the operator. Programs can be edited to change processing specifications, or to add or remove steps.

One step in a program includes the following inputs:

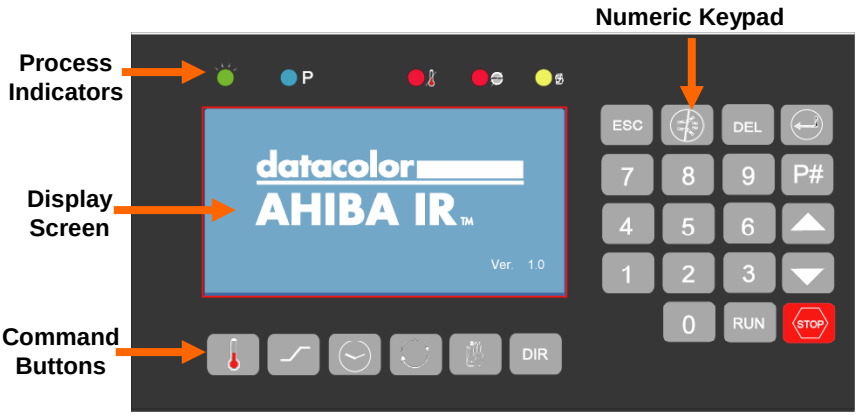
- Temperature
- Gradient
- Time at temperature
- Speed of rotation
- Hold process step (if needed)

This information is entered through command buttons on the keypad and icons on the display screen.

INFORMATION
Reversing time is not needed. The Ahiba IR automatically reverses rotation every minute.

Controller and User Interface

The Ahiba IR interface is separated into four main groups. These are the display screen, the command button group, the process indicators group and the numeric keypad. The following sections will describe each.



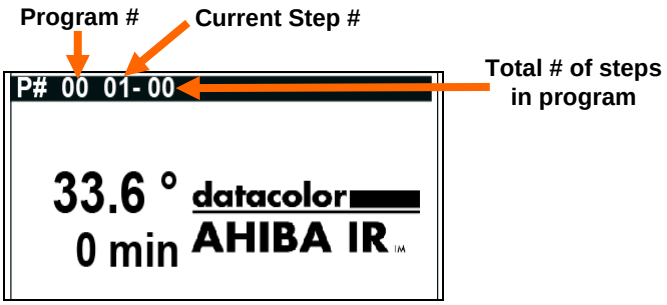
Display

The Ahiba IR display consists of 5 main screens:

- System Idle Screen
- Program Maintenance Screen
- Data Entry Screen
- Program Directory Screen

System Idle Screen

The System Idle screen is displayed when the system is powered. It is also displayed when no process is running.

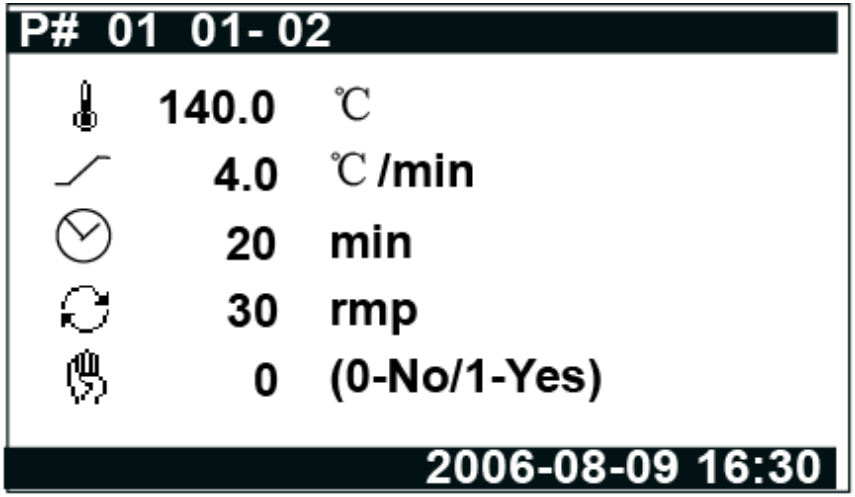


Program Maintenance Screen

The Program Maintenance screen allows the user to create new programs, edit existing programs, delete programs and perform system maintenance.

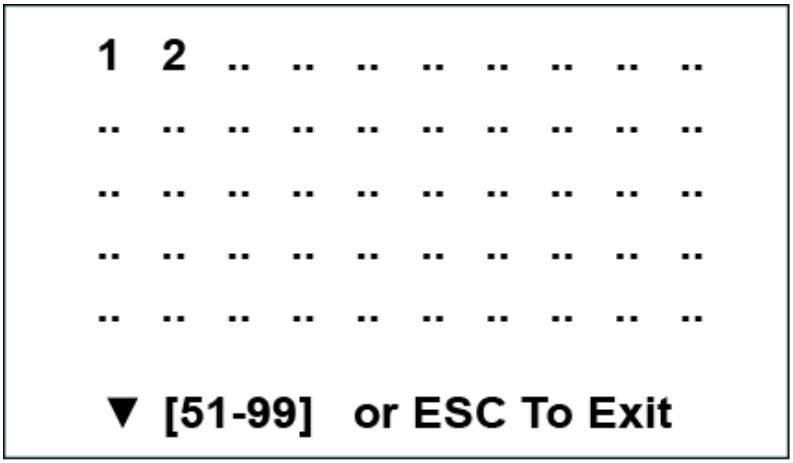
Data Entry Screen

The Data Entry screen will display all the editable parameters for a given step in a program. The program number and the current step are displayed in the upper left corner.



Program Directory Screen

The program directory screen displays all available program slots. If the slot is already occupied, a number will be displayed. If no program exists in a slot," " will display for the slot. The directory consists of 2 screens to accommodate all 99 program slots.



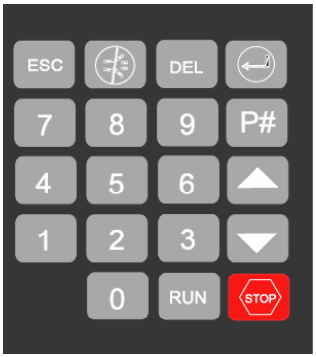
LED Process Indicators

LED indicators are located at the top of the controller. These are used to communicate specific information to the operator. They are bright and visible from a distance, making it easy to monitor system status from across a room.

Below is a key for these symbols:

Indicator	Function
	**Power On.** When controller is on, this indicator is solid green.
	**Process Running.** When process is running, this indicator is solid blue.
	**Temperature Alarm.** When controller detects an alarm, this indicator is solid red.
	**Motor Speed Detection Error.** When controller detects no motor movement, this indicator is solid red.
	**Process Hold.** When a programmed hold or manually-set hold is applied, this indicator is flashing yellow.

Numeric Keypad



The Ahiba IR numeric keypad is a membrane keypad that contains 19 keys.

Key	Function
	**Escape.** Press to exit from current screen.
	**Alarm Reset.** Press to silence buzzer or reset alarms.
	**Delete.** Press to delete data entry value, or to delete an entire program.
	**Enter.** Press to record data entry value.
	**Process.** Press to access program maintenance screen.
	**Up/Down Arrow.** Press to scroll through program steps, or to advance to another step.
	**Run.** Press to run a program, or to resume a program currently on hold.
	**Stop.** Press to store the program currently running.
	**Numeric Keys.** Press to enter numeric data values.

Command Buttons

Ahiba IR uses the command buttons shown below to access data input.

These buttons are used to create new programs and include functions to enter, update and delete data. They are also used to edit existing programs.

Button	Function
	**Temperature** control key. Provides control to the temperature input line.
	**Gradient** control key. Provides control to the gradient input line.
	**Time** control key. Provides control to the time input line.
	**Motor Speed** control key. Provides control to the speed input line.
	**Hold** control key. Provides control to the hold input line. Also used to put the unit into manual hold.
	**Directory** key. Provides access to the program directory screens. Also used to enter a decimal point (.) when required for numeric value input.

INFORMATION

The DIR button is a dual-function button.

Below is a description of the each data entry field available for a single step in a program:

Field Name	Data Input
Program Name	User-assigned number
TEMP +___ _C	Set-point temperature
GRAD + _ _ C/m	Temperature rate of rise/gradient (°C/min)
SPEED __ rpm	Speed of rotation
HOLD _	Holds the process when the time value of the step has been reached (0/1=No/Yes)

Units equipped with a 5L drum should limit the heating gradient input to 2.5°C/min, this due to the mass of the beaker and to prevent "Temperature out of Range" errors.

NOTES

Programs

Overview

This section provides instructions and examples for creating a program for Ahiba IR. Keep in mind the following:

- The local memory can accommodate up to 99 programs.
- A program can include a maximum of 15 steps.
- A step defines a temperature, gradient, speed, or hold (time).

A HOLD is generally used when the program requires operator intervention. A hold can be included as a program step, or can be inserted manually at run time. *See also Running a Program, Program Holds for a detailed discussion of this option.*

Limit Values

When entering data for a program, all entries are checked against the following limits to ensure they are within the operating range of the machine:

Parameter	Limit Value
TEMPERATURE (Processing temperature	+20°C +140°C +77°F +284°F
TIME (minutes)	0 – 180 min
GRADIENT	-5.0°C +5.0°C/min
SPEED	5 – 50 rpm
HOLD	0 1

Units equipped with a 5L drum should limit the heating gradient input to 2.5°C/min, this due to the mass of the beaker and to prevent "Temperature out of Range" errors.

Storing a Program

Below is the procedure for storing a program:

1. From the *System Idle* screen, press the **P#** button. The Program Maintenance screen displays.
2. Input a program number and press **Enter**. *Note: You can check the directory to determine if a specific program slot is available.*
3. The *Data Entry* screen will be displayed. In the upper left corner, the program number and step are identified. Press the command button corresponding to first step to be entered.
4. When all data for step #1 is entered, press the **UP** arrow button. The program will advance to step #2. Repeat this procedure until all steps in the program are entered.
5. When the program entry is complete, press the **Enter** key. All of the data will be saved, and the program will return to the Program Maintenance screen. You can now run this program, edit the program information, or delete the entire program.

Editing a Program

1. From the System Idle screen, press the **P#** button. The Program Maintenance screen will be displayed.
2. Enter the program number to be edited, and press the **Enter** key. The Data Entry screen for the program selected displays, and the cursor will be located on step #1.
3. Use the **Up** and **Down** arrow keys on the keypad to scroll through the steps of the program. The step number display in the upper left corner of the display.
4. When you have reached the step to be edited, use the specific command button necessary to change it. For example, if you need to edit the temperature for the step, press the **Temperature Control** key. If several changes are required, scroll to the appropriate steps and make the changes.
5. When all edits are completed, press the ENTER key. All data will be saved and the display will switch to the Program Maintenance screen. You can now run this program, edit the program information, or delete the entire program.

Deleting a Program

1. From the *System Idle* screen, press the **P#** button. The Program Maintenance screen displays.
2. Enter the program number to be deleted.
3. Press the **DEL** key on the keypad. You will hear a beep. On the bottom of the screen, the work **Delete** displays.
4. Press **Enter** to delete the program, or **Esc** to cancel the delete command.

Running a Program

The Ahiba IR does not contain any programs stored at the factory. You must store a program, before you can operate the Ahiba IR.

INFORMATION

The program can be manually stopped at any time by pressing the **STOP** button.

CAUTION

Do not unplug the bayonet sensor from the reference beaker when a program is running. The temperature will drop very quickly, activating temperature monitoring, and the program will stop running.

1. From the System Idle screen, press the **P#** button. The Program Maintenance screen displays.
2. Enter the number of the program to run, and press the RUN key. The Process Running screen, step #1 will be displayed. It displays the following information:
   - The actual temperature and residual dyeing time clock (large font) will be displayed. This is the approximate time needed to complete all steps in the process.
   - The step number being performed is displayed in the upper left corner.
   - The clock will update the processing times as the machine moves through the program steps, and count down as the time expires.
   - The P# LED will be bright blue.
   - The program will run through all steps in the program.

3. Press the **Run** key. The program will establish the set-point temperature and advance to the next step.
4. When the process is completed:
   - The P# LED will be turned off.
   - The word END will be displayed in the upper right corner of the display.
   - An audible alert will sound.

Program Hold

A HOLD is generally used when the program requires operator intervention. An example of this is when the operator needs to dose(add) chemical auxiliaries at prescribed times in the process.

If a HOLD is included in the program, you are alerted through the following warnings:

- An audible alarm will sound.
- A hand icon will be displayed in the lower left corner of the display.
- A yellow (hold) LED will light.

Hold Precautions and Tips

- When a hold is enabled, the IR lamps are turned off, and the motor stops turning. As a result, the temperature inside the beaker drops.
- When the temperature in the beaker drops by more then 2°C, a temperature status alert will appear on the display. This is an alert that the temperature has dropped below the set point limit. When the door is closed, the program will recover.
- When the temperature drops by more than 5°C, the process will stop, and will not automatically restart.

Manual Program Hold

The operator can manually place a hold on the program.

To do this:

- Press the HAND command button. The program will hold.
- Press the RUN key to resume the program.

Alarms and Status Messages

The Ahiba IR uses a combination of visual and auditory alerts to communicate process and system information to the user. These include:

- Audible alert system
- LED status panel
- Display icons

Specific combinations of these alerts are used to communicate specific problems. *See also Troubleshooting Alerts and Alarms for complete information and corrective action to be taken regarding each alarm combination.*

Audible Alerts

The Ahiba IR has three distinct audible alerts:

- **Continuous tone.** This is a general alarm.
- **Long Beep/Short Beep.** This indicates the current step is a program hold.
- **Series of Short Beeps.** This indicates the end of the program.

Display Icons

See also Troubleshooting Alerts and Alarms for complete information and corrective action to be taken regarding each alarm combination.

The display icons used as alerts by the Ahiba IR include:

Icon	Message
	**Red Temperature LED.** This icon appears on the bottom left of the display, under the following conditions: When a change of measured beaker temperature exceeds ± 2°C. of the set-point temperature. During heating and cooling cycles, the variation from the set point temperature exceeds ±15°C.
	**Red Motor Speed LED.** This LED lights when the drive motor stops turning. It is displayed with the Roll-O-Matic alarm.
	**Door Open alarm icon.** When the door is opened during a dyeing process, this icon is displayed.
	**Temperature Alarm icon**. When the measured beaker temperature falls below 10°C, or above 350°C, this alarm icon displays.

Icon	Message
	**Roll-o-matic Alarm icon.** When the drive motor stops turning for more than 5 minutes, this icon is displayed.
	**Power Interruption icon.** When the power to the unit has been interrupted or stopped for more than 2 minutes, this icon is displayed.

Troubleshooting Alerts and Alarms

Below are common alarm combinations that may occur while you are running a process.

Alert/Alarm Combination	Message	Possible Problem
Temperature Sensor Alarm  • Continuous buzzer tone • Red temperature LED displays solid red	Two different situations trigger this alarm. (1) System has detected a beaker temperature variation of greater than ±2°C. The icon is displayed on the screen and a continuous buzzer tone sounds. System will attempt to self-correct by introducing either cool or hot air, depending on the situation. When the temperature variation falls within ±2°C, the alarm will reset. The buzzer will stop and the icon will disappear from the screen. (2) During a heating or cooling cycle in the program, the system has detected a temperature variation of ±15°C. The program must be re-started at step #1 after the problem is corrected.	Temperature sensor cable is unplugged or defective
Door Open Alarm  • Continuous buzzer tone • Door Open icon appears on display	Door has been opened while process is running	Defect in *door closed* sensor.

Alert/Alarm Combination	Message	Possible Problem
Temperature Alarm  • Temperature Alarm LED lights • Continuous buzzer.	Two different situations trigger this alarm. (1) **PT-100 Open**. Beaker temperature has risen above 350°C. • The screen displays a temperature of 350°. • A continuous buzzer sounds. When temperature is above 350° C, cooling fans are activated. Alarms will automatically reset when target temperature is achieved. (2) **PT-100 short-circuit**. • Temperature displays 350° • Display reports TOVER in top right corner. System will not operate until problem is fixed. Alarm must be reset by pressing **Alarm Reset** button on the numeric keypad.	Defective PT 100 temperature sensor cable.
Roll-O-Matic Alarm  • Continuous buzzer alarm • Roll-O-Matic Alarm LED lights	Motor may have stopped turning. • When the driver motor stops turning for more than 5 minutes, this alarm triggers. The system will stop heating, and the program will stop. Program must be restarted from step #1. Alarm will reset and alarm icon when disappear when the wheel starts turning again.	Defective motor; Defector motor position switch; defective reversing circuit on power interface card

Alert/Alarm Combination	Message	Possible Problem
Power Interruption  • Power interruption icon displays on screen. • Roll-O-Matic Alarm icon displays on screen. • Continuous alarm sounds.	Power to the unit has been disrupted for longer than 2 minutes. If the power is disrupted for more than 2 minutes, the process must be restarted. Press **Alarm Reset** button on keypad to reset this alarm. Icon will disappear from the display.	Power failure.

Appendix

Specifications

External Dimensions (H x W x D)	670mm x 570mm x 680mm 26.4” x 22.4” x 26.8”
Internal Dimensions (H x W x D)	500mm x 450mm x 330mm (19.7” x 17.7” x13”)
Weight	69 Kg, 152 lbs
Electrical Supply	230V AC ±10%, 50/60 Hz
Heating Power	3300 W
Total Power	3850 W
Operating Temperature	5°C to 40°C 80% max. relative humidity up to 31°C 50% relative humidity up to 40° C.
Approvals	UL, CSA, CE

***** *Specifications subject to change without notice.*

Minimum/Maximum Beaker Loads

Minimum Beaker Load

Beaker Size	Minimum No. of Beakers
150cc	3 beakers
300cc	3 beakers
500cc	2 beakers
1000cc	2 beakers

Maximum Beaker Load

Beaker Sizes (max)	Maximum # of Beakers	Ideal Sample Size
150 ml	20 beakers	5 grams
300 ml	15 beakers	10 grams
500 ml	8 beakers	25 grams
1000 ml	8 beakers	50 grams
5 liter	1 beaker	200 grams

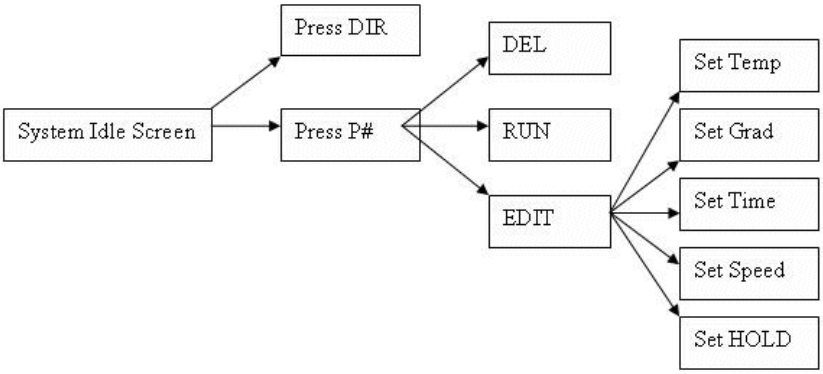
Maintenance List

Below is a routine maintenance checklist and schedule of tasks that should be performed to insure the proper operation of the unit.

Machine Part/ Procedure	Party Responsible for Maintenance	Every Cycle	Quarterly	Yearly
Accessories Wash beakers, beaker lids, and dosing accessories thoroughly. Flush nipples with clean, warm water..	User	X		
Machine Keep the interior surfaces clean and shiny in order to maximize reflection.	User	X		
Dyeing Beaker Check for leaks. Replace O-ring if necessary.	User	X		
Drive Check belts and listen for drive noise. If necessary, adjust or replace belts	Datacolor Service			X
Speed of the Drive Check and calibrate, if necessary. Tolerance = ±2 rpm.	Datacolor Service			X
Temperature Calibration Check the temperature calibration and adjust if necessary. Tolerance ±1°C *NOTE: Contact Datacolor Service personnel to complete this check.*	Datacolor Service personnel			X
Gradient Test Test and ensure maximum achievable gradient is within tolerance. Make repairs as needed.	Datacolor Service personnel			X

Menu Flow

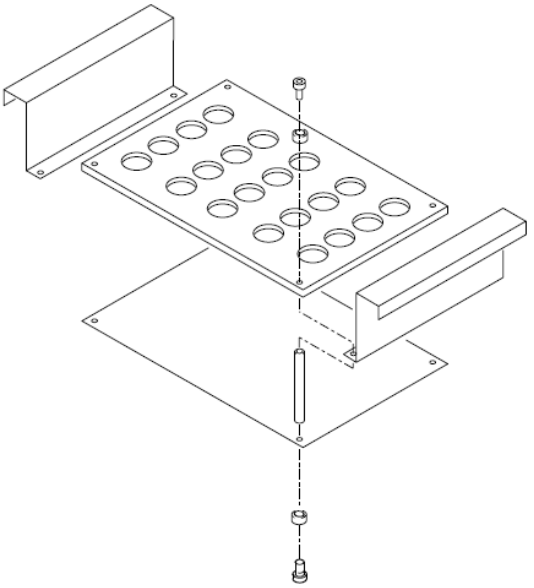
Below is a schematic of the program flow, provided for reference purposes:



Accessories

Beaker Preparation Basket

An optional beaker preparation basket is available with the unit. If this is included with your unit, you must assemble it. Below is an assembly diagram:



Below is a picture of a fully loaded beaker prep basket.

Beaker Prep Basket

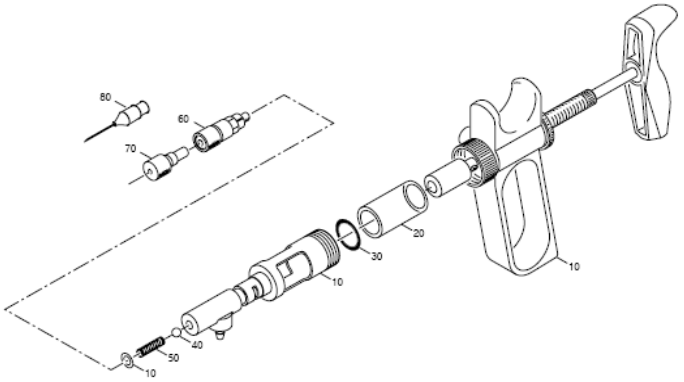
Dosing Accessories

Accessories are available for both membrane dosing and injection dosing techniques.

Membrane Dosing

Injection Dosing

Dosing Syringe Parts



CAUTION

Thoroughly rinse the dosing syringe with warm water following each use. This cleans the interior of the parts, extends the life of the seals and prevents clogging due to dried chemicals.

Below is information for ordering replacement parts from Datacolor for the dosing syringe:

Drawing Position	Description	Part No
10	10cc Dosing Injector	474070
20	Dosing Injector 10cc	474077
30	Glass cylinder 10cc	474080
40	Seal to injector	474082
50	Valve Ball	474081
60	Valve Spring	474007
70	Dosing Adapter Teflon Seal	474083
20	5cc Dosing Injector Glass cylinder 5cc	474087
80	Membrane Dosing Needle (pack of 12)	842016

Complete Accessories List

For a complete accessory list, refer to the pages included after the Index.

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