# BUNN



## TB3 TB3-LP

### **OPERATING & SERVICE MANUAL**

#### **BUNN-O-MATIC CORPORATION**

POST OFFICE BOX 3227 SPRINGFIELD, ILLINOIS 62708-3227 PHONE: (217) 529-6601 FAX: (217) 529-6644

www.bunn.com

#### CONTENTS

Introduction	2
Warranty	2
User Notices	3
Electrical & Plumbing Requirements	4
Initial Set-Up	5
Adjusting Brew Volumes	6
Auto Sweetener Set-up	6
Operating Controls	7
Cleaning	8
Auto Sweetener Cleaning	8
Tea Brewing	8
Troubleshooting	9
Service	15
Wiring Diagrams	
5 5	-

#### INTRODUCTION

This equipment will brew a three-gallon batch of fresh tea into an awaiting dispenser. The tea will be dispensed at approximately room temperature to conserve ice. The brewer is only for indoor use on a sturdy counter or shelf.

#### **BUNN-O-MATIC COMMERCIAL PRODUCT WARRANTY**

Bunn-O-Matic Corp. ("BUNN") warrants equipment manufactured by it as follows:

1) All equipment other than as specified below: 2 years parts and 1 year labor.

2) Electronic circuit and/or control boards: parts and labor for 3 years.

3) Compressors on refrigeration equipment: 5 years parts and 1 year labor.

4) Grinding burrs on coffee grinding equipment to grind coffee to meet original factory screen sieve analysis: parts and labor for 3 years or 30,000 pounds of coffee, whichever comes first.

These warranty periods run from the date of installation BUNN warrants that the equipment manufactured by it will be commercially free of defects in material and workmanship existing at the time of manufacture and appearing within the applicable warranty period. This warranty does not apply to any equipment, component or part that was not manufactured by BUNN or that, in BUNN's judgment, has been affected by misuse, neglect, alteration, improper installation or operation, improper maintenance or repair, damage or casualty. This warranty is conditioned on the Buyer 1) giving BUNN prompt notice of any claim to be made under this warranty by telephone at (217) 529-6601 or by writing to Post Office Box 3227, Springfield, Illinois 62708-3227; 2) if requested by BUNN, shipping the defective equipment prepaid to an authorized BUNN service location; and 3) receiving prior authorization from BUNN that the defective equipment is under warranty.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY OTHER WARRANTY, WRITTEN OR ORAL, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF EITHER MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. The agents, dealers or employees of BUNN are not authorized to make modifications to this warranty or to make additional warranties that are binding on BUNN. Accordingly, statements by such individuals, whether oral or written, do not constitute warranties and should not be relied upon.

If BUNN determines in its sole discretion that the equipment does not conform to the warranty, BUNN, at its exclusive option while the equipment is under warranty, shall either 1) provide at no charge replacement parts and/or labor (during the applicable parts and labor warranty periods specified above) to repair the defective components, provided that this repair is done by a BUNN Authorized Service Representative; or 2) shall replace the equipment or refund the purchase price for the equipment.

## THE BUYER'S REMEDY AGAINST BUNN FOR THE BREACH OF ANY OBLIGATION ARISING OUT OF THE SALE OF THIS EQUIPMENT, WHETHER DERIVED FROM WARRANTY OR OTHERWISE, SHALL BE LIMITED, AT BUNN'S SOLE OPTION AS SPECIFIED HEREIN, TO REPAIR, REPLACEMENT OR REFUND.

In no event shall BUNN be liable for any other damage or loss, including, but not limited to, lost profits, lost sales, loss of use of equipment, claims of Buyer's customers, cost of capital, cost of down time, cost of substitute equipment, facilities or services, or any other special, incidental or consequential damages.

#### **USER NOTICES**

Carefully read and follow all notices on the equipment and in this manual. They were written for your protection. All notices on the equipment should be kept in good condition. Replace any unreadable or damaged

#### #00831.0000

#### 

- Fill water tank before turning on thermostat or connecting appliance to power source.
- Use only on a properly protected circuit capable of the rated load.
- Electrically ground the chassis.
- Follow national/local electrical codes.
- Do not use near combustibles.

FAILURE TO COMPLY RISKS EQUIPMENT DAMAGE, FIRE, OR SHOCK HAZARD

READ THE ENTIRE OPERATING MANUAL BEFORE BUYING OR USING THIS PRODUCT

THIS APPLIANCE IS HEATED WHENEVER CONNECTED TO A POWER SOURCE 00831.0000F 3/98 ©1998 BUINN-0-MATIC CORPORATION

#37881.0000

## 

To reduce the risk of electric shock, do not remove or open cover. No user-serviceable parts inside. Authorized service personnel only. Disconnect power before servicing.

#### #03408.0000



#### #03409.0000



#### #00656.0000

This equipment must be installed to comply with the Basic Plumbing Code of the Building Officials and Code Administrators International, Inc. (BOCA) and the Food Service Sanitation Manual of the Food and Drug Administration (FDA). For models installed out side the U.S.A., comply with the applicable Plumbing/Sanitation Code.

#### #06064.0000



#### BREWERS

**CAUTION** – Disconnect the power source from the brewer prior to the removal of any panel for the replacement or adjustment of any component. **NOTE:** Check that the brewer is connected to water supply, the tank is properly filled, and a funnel and server are in place, prior to setting or modifying batch sizes.

Modifying batch sizes. To modify a batch volume, first check that the SET/ LOCK switch is in the "SET" position on the circuit board. If the brewer has a batch selector switch, position it to the size to be changed.

To increase a batch size, Press and hold the START or BREW switch until three clicks are heard. Release the switch and then press it again one or more times. Each time the switch is pressed, two seconds are added to the brew time period. Allow the brew cycle to finish in order to verify that the desired volume has been achieved.

To decrease a batch size, Press and release the START or BREW switch once for every two-second interval to be removed from the total brew time period; then immediately press and hold down the START or BREW switch until three clicks are heard. Release the switch. Allow the brew cycle to finish in order to verify that the desired volume has been achieved.

2. Setting batch sizes. To set a batch volume, first check that the SET/LOCK switch is in the "SET" position on the circuit board. Press and hold the START or BREW switch until three distinct clicks are heard (this will take approximately ten seconds), and then release the switch. (Failure to release the switch within two seconds from the third click causes the volume setting to be aborted). View the level of the liquid being dispensed. When the desired level is reached, turn the ON/OFF switch to "OFF". The brewer remembers this volume and will continue to brew batches of this size until the volume setting procedure is repeated. Empty server(s), turn selector switch to positions that have yet to be set, and repeat batch setting procedure until all batch sizes are set.

 $\ensuremath{\textbf{NOTE:}}$  When brewing coffee, batch volumes will decrease due to absorption by

1

#### ELECTRICAL REQUIREMENTS

**CAUTION** - The brewer must be disconnected from the power source until specified in *Initial Set-Up*.

120V model brewers require 2-wire, grounded service rated 120 volts ac, 15 amp, single phase, 60 Hz.

"A" model brewers require 2-wire, grounded service rated 230 volts ac, 10 amp, single phase, 50 Hz.

"B" model brewers require 2-wire, grounded service rated 100 volts ac, 15 amp, single phase, 60 Hz.

**WARNING** - If the power cord is ever damaged, it must be replaced by the manufacturer or its service agent with a special cord available from the manufacturer or its service agent in order to avoid a hazard.

Proceed as follows:

#### **Electrical Hook-Up**

**CAUTION –** Improper electrical installation will damage electronic components.

- 1. An electrician must provide electrical service as specified.
- 2. Using a voltmeter, check the voltage and color coding of each conductor at the electrical source.
- 3. Remove top cover from the brewer.
- 4. Rotate the control thermostat knob fully counterclockwise to the "OFF" position and replace the top cover.
- 5. Connect the brewer to the power source.
- 6. If plumbing is to be hooked up later be sure the brewer is disconnected from the power source. If plumbing has been hooked up, the brewer is ready for *Initial Set-Up*.

#### **PLUMBING REQUIREMENTS**

These brewers must be connected to a cold water system with operating pressure between 20 (138) and 90 psi (620 kPa) from a  $\frac{1}{2}$ " or larger supply line. A shut-off valve should be installed in the line before the brewer. Install a regulator in the line when pressure is greater than 90 psi (620 kPa) to reduce it to 50 psi (345 kPa). The water inlet fitting is  $\frac{1}{4}$ " flare.

**NOTE -** Bunn-O-Matic recommends 1/4" copper tubing for installations of less than 25 feet and 3/8" for more than 25 feet from the 1/2" water supply line. A tight coil of copper tubing in the water line will facilitate moving the brewer to clean the countertop. Bunn-O-Matic does not recommend the use of a saddle valve to install the brewer. The size and shape of the hole made in the supply line by this type of device may restrict water flow.

This equipment must be installed to comply with the Basic Plumbing Code of the Building Officials and Code Administrators International, Inc. (BOCA) and the Food Service Sanitation Manual of the Food and Drug Administration (FDA). For models installed outside the U.S.A., you must comply with the applicable Plumbing/Sanitation Code for your area.

- 1. Remove the shipping cap from the bulkhead fitting on the rear of the brewer.
- 2. Flush the water line and securely attach it to the bulkhead fitting on the rear of the brewer.
- 3. Turn on the water supply.

**NOTE**: TheFlow Control/Strainer assembly is internal, located inside the back panel.

#### **INITIAL SET-UP (cont.)**

- 21. When all water stops flowing, check the water volume in the dispenser. It should be 396 ounces.
- 22. If not, unplug the brewer and remove the top lid.
- 23. Adjust the dilution knob of the timer on the right side of the hood as required. Replace the top lid, plug in the brewer, start, and measure another brew cycle.
- 24. Repeat steps 20-23 until the proper water volume is achieved.
- 25. Return the delay knob of the timer on the right side of the hood to eight minutes. Replace the top lid and plug in the brewer.
- 26. Reinstall the metal discharge tip into the funnel.
- 27. Load the funnel with a BUNN® paper filter and approximately four ounces of loose tea leaves.
- 28. Place the ON/OFF switch in the "ON" position, momentarily press the start switch, and allow both the concentrate and dilution cycles to occur. Observe the funnel discharge and the dilution streams near the end of the brew cycle. The dilution stream should stop approximately thirty seconds after the funnel discharge has stopped.
- 29. If not, unplug the brewer and remove the top lid.
- 30. Adjust the delay knob of the timer on the right side of the hood as required. Replace the top lid and plug in the brewer.
- 31. Repeat steps 27-30 until the proper dilution timing is achieved.

#### **ADJUSTING BREW VOLUMES**

**CAUTION** - Disconnect the power source from the brewer prior to the removal of any panel for the replacement or adjustment of any component.

**NOTE:** Prior to setting or modifying batch sizes, check that the brewer is connected to water supply, the tank is properly filled, and a funnel and server are in place.

1. **Modifying batch sizes.** To modify a batch volume, first check that the SET/LOCK switch is in the "SET" position on the circuit board.

**To increase a batch size.** Press and hold the START or BREW switch until three clicks are heard. Release the switch (Failure to release the switch within two seconds after the third click causes the volume setting to be aborted and previous volume setting will remain in memory) and press it again one or more times. Each time the switch is pressed, two seconds are added to the brew time period. Allow the brew cycle to finish in order to verify that the desired volume has been achieved.

**To decrease a batch size.** Press and release the START or BREW switch once for every two-second interval to be removed from the total brew time period; then immediately press and hold down the START or BREW switch until three clicks are heard. Release the switch. (Failure to release the switch within two seconds after the third click causes the volume setting to be aborted and previous volume setting will remain in memory). Allow the brew cycle to finish in order to verify that the desired volume has been achieved.

2. Setting batch sizes. To set a batch volume, first check that the SET/LOCK switch is in the "SET" position on the circuit board. Press and hold the START or BREW switch until three distinct clicks are heard, and then release the switch. (Failure to release the switch within two seconds after the third click causes the volume setting to be aborted and previous volume setting will remain in memory). View the level of the liquid being dispensed. When the desired level is reached, turn the ON/OFF switch to "OFF" (lower). The brewer remembers this volume and will continue to brew batches of this size until the volume setting procedure is repeated.

**NOTE:** When brewing tea, batch volumes will decrease due to absorption by the tea grounds.

3. Setting programming disable feature. If it becomes necessary to prevent anyone from changing brew times once programmed, you can set the SET/LOCK switch to the "LOCK" position. This will prevent any programming to be done until switch is once again placed in the "SET" position.

#### **AUTO SWEETENER SET-UP**

**CAUTION** - The brewer must be disconnected from the power source throughout the Initial Set-Up, except when specified in the instructions.

- 1. Remove the top lid and rear panel.
- 2. Make sure the brewer water supply is off.
- 3. Connect sweetener hose from the bag in a box delivery system to the rear fitting marked "Sweetener" .

**IMPORTANT** - System delivery pressure must be regulated between 30-40 psi. System also needs to deliver product for at least 4 minutes without shutting off. Some pump systems shut off after a few minutes of continuous running.

- 4. Set the "Delay knob on the dilution timer to the 3 minute setting. (The minimum delay setting)
- 5. Plug brewer into the power source.
- 6. Place an empty reservoir under the dilution nozzle of the brewer.
- 7. Close the adjustment valve on the rear of the brewer fully (clockwise), then open (counterclockwise) 1/2 turn.
- 8. Set the selector switch to the "Sweetened" side and press the "Start" switch momentarily. (After approximately 3 minutes the sweetener will come out of the dilution nozzle.)
- 9. Run sweetener for 1 minute, then set selector switch to the "Off" position. The flow will stop.
- 10. Measure the amount of sweetener dispensed and calculate if the volume needs to be increased or decreased (Dilution cycle is usually between 3 to 3 1/2 minutes).
- 11. If adjustment is needed, turning the adjustment valve clockwise decreases the amount of sweetener dispensed and turning the adjustment valve counterclockwise increases the amount of sweetener dispensed.
- 12. Set the "Delay" knob on the dilution timer back to the 6 to 7 minute setting.
- 13. After the desired volume has been set, turn the water supply on.
- 14. Reinstall the top lid and rear panel.

The brewer may now be returned to service.

#### **OPERATING CONTROLS**

#### A. ON/OFF Switch

**ON** - Placing the switch in the left position allows the start switch to activate a timed brew cycle for three gallons of tea.

**OFF** - Placing the switch in the right position stops the brew cycle. Stopping a brew cycle after it has been started will not stop the flow of water into the funnel until the tank syphons down to its proper level. **The switch should always be placed in this position after a brew cycle and whenever the brewer is unattended**.

#### B. Start Switch

Starts a brew cycle when the ON/OFF switch is in the "ON" position.

#### C. UNSWEET/OFF/SWEET Selector Switch (Models with Sweetener Only)

**UNSWEET** - Placing the switch in the left positional allows the start switch to activate a timed brew cycle for three gallons of tea without sweetener.

**OFF** - Placing the switch in the middle position stops the brew cycle. Stopping a brew cycle after it has been started will not stop the flow of water into the funnel until the tank syphons down to its proper level. **The switch should always be placed in this position after a brew cycle and whenever the brewer is unattended.** 

**SWEET -** Placing the switch in the right positional allows the start switch to activate a timed brew cycle for three gallons of tea with sweetener.

#### CLEANING

#### CAUTION - CLEAN AND SANITIZE YOUR ICED TEA BREWER DAILY

- 1. Remove and thoroughly clean the entire brew funnel. The funnel tip and screen must be free from any tea particles or residue. Reassemble the funnel.
- 2. Place the ON/OFF switch in the "OFF" position. Remove and thoroughly rinse the sprayhead. The holes must be open and clear of any mineral deposits. Wipe the sprayhead panel clean with a damp cloth.
- 3. Insert the deliming spring into the sprayhead fitting until no more than two inches is visible and move it in and out 5 or 6 times. Insert the spring into the airvent hole in the sprayhead panel and move it in and out 5 or 6 times. Reattach the sprayhead.
- 4. Wash the entire outside surface of the brewer with a clean damp cloth.

**CAUTION -** DO NOT KEEP BREWED ICED TEA OVERNIGHT. THE SERVER MUST BE CLEANED DAILY.

#### **AUTO SWEETENER CLEANING**

- 1. Remove the connector off of the bag in a box.
- 2. Place the end in a bucket of hot water (120°-130°F)
- 3. Place an empty reservoir on the base under the dilution nozzle.
- 4. Set the selector switch to the "Sweetened" setting.
- 5. Press and release the "Start" switch.
- 6. Run three brew cycles in a row, emptying the reservoir after each cycle.
- 7. When the three cycles have been completed, hook the connector back up to the bag in a box system. (This will keep buildup from occurring in the system.)

This procedure should be performed weekly or as needed to keep the system clear.

#### **TEA BREWING**

- 1. Begin each brew cycle with a clean empty brew funnel and server. (Be sure the server lid doesn't interfere with the flow of dilution water.)
- 2. Insert a BUNN<sup>®</sup> filter into the funnel.
- 3. Pour the packet of loose fresh tea leaves into the filter. Approximately four ounces is recommended.
- 4. Level the bed of tea leaves by gently shaking.
- 5. Slide the funnel into the funnel rails until it stops.
- 6. Place the ON/OFF switch in the "ON" position.
- 7. Momentarily press the start switch.

**CAUTION -** The funnel contains hot liquids. Remove funnel slowly.

- 8. Carefully remove the brew funnel and discard the used filter when tea no longer drips from the funnel tip.
- 9. Place the ON/OFF switch in the "OFF" position to prevent a false start.
- 10. Fresh tea is available at the faucet.

#### TROUBLESHOOTING

A troubleshooting guide is provided to suggest probable causes and remedies for the most likely problems encountered. If the problem remains after exhausting the troubleshooting steps, contact the Bunn-O-Matic Technical Service Department.

- Inspection, testing, and repair of electrical equipment should be performed only by qualified service personnel.
- All electronic components have 120 240 volt ac and low voltage dc potential on their terminals. Shorting of terminals or the application of external voltages may result in board failure.
- Intermittent operation of electronic circuit boards is unlikely. Board failure will normally be permanent. If an intermittent condition is encountered, the cause will likely be a switch contact or a loose connection at a terminal or crimp.
- Solenoid removal requires interrupting the water supply to the valve. Damage may result if solenoids are energized for more than ten minutes without a supply of water.
- The use of two wrenches is recommended whenever plumbing fittings are tightened or loosened. This will help to avoid twists and kinks in the tubing.
- Make certain that all plumbing connections are sealed and electrical connections tight and isolated.
- This brewer is heated at all times. Keep away from combustibles.

#### WARNING -

- Exercise extreme caution when servicing electrical equipment.
- Unplug the brewer when servicing, except when electrical tests are specified.
- Follow recommended service procedures
- Replace all protective shields or safety notices

Problem	Probable Cause	Remedy
Brew cycle will not start	1. No water	Water lines and valves to the brewer must be open.
	2. No power or incorrect voltage to the brewer	Check circuit breakers or fuses.
	3. Strainer/Flow Control (.750GPM)	(A) Direction of flow arrow must be pointing upwards in the brewer.
		(B) Remove the strainer/flow con- trol and check for obstructions. Clear or replace.

TROUBLESHOOTING (cont.)		
PROBLEM	PROBABLE CAUSE	REMEDY
Brew cycle will not start (cont.)	4. ON/OFF Switch	Refer to <i>Service</i> - ON/OFF Switch for testing. See page 24
	5. Start Switch	Refer to <i>Service</i> - Start Switch for testing procedures. See page 23
	6. Brew Timer	Refer to <i>Service</i> - Brew Timer for testing procedures. See page 18
	7. Brew Solenoid Valve	Refer to <i>Service</i> - Brew Solenoid Valve for testing procedures. See page 16
	8. Internal Flow control (.195 GPM)	(A) Direction of flow arrow must be pointing towards check valve.
		(B) Remove the flow control and check for obstructions. Clear or replace.
Water is not hot	1. Limit Thermostat <b>CAUTION -</b> Do not eliminate or bypass limit thermostat or thermal cut-off. Use only BOM replacement part 29329.0001	Refer to <i>Service</i> - Limit Thermostat for testing procedures. See page 22
	2. Control Thermostat	Refer to <i>Service</i> - Control Ther- mostat for testing procedures. See page 17
	3. Tank Heater	Refer to <i>Service</i> - Tank Heater for testing procedures. See page 27
Dilution cycle will not start	1. ON/OFF Switch	Refer to <i>Service</i> - ON/OFF Switch for testing procedures. See page 24
	2. Start Switch	Refer to <i>Service</i> - Start Switch for testing procedures. See page 23
	3. Dilution Timer	Refer to <i>Service</i> - Dilution Timer for testing procedures. See page 21

TROUBLESHOOTING (cont.)		
PROBLEM	PROBABLE CAUSE	REMEDY
Dilution cycle will not start (cont.)	4. Dilution Solenoid Valve	Refer to <i>Service</i> - Dilution Solenoid Valve for testing procedures. See page 20
Inconsistent beverage level in dispenser	1. Internal Flow Control (.195 GPM)	(A) Direction of flow arrow must be pointing towards the check valve.
		(B) Remove the flow control and check for obstruction. Clear or replace.
	2. Syphon System	The brewer must be level or slightly lower in front to syphon properly.
	3. Lime Build-up <b>CAUTION -</b> Tank and tank compo- nents should be delimed regularly depending on local water condi- tions. Excessive mineral build-up on stainless steel surfaces can initiate corrosive reactions resulting in serious leaks.	Inspect the tank assembly for ex- cessive lime deposits. Delime as required.
	4. Water Pressure	The water pressure to the brewer must be at least 20 psi (138 kPa).
Consistently high or low beverage level in the dispenser	1. Brew Timer/Delay Timer	With the ON/OFF switch "ON" adjust the brew timer to achieve the rec- ommended 76 oz. of concentrate then the dilution timer to achieve a total of 396 oz. for each three-gal- lon brew cycle.
	2. Strainer/Flow Control (.750GPM)	(A) Direction of flow arrow must be pointing upwards in the brewer.
		(B) Remove the strainer/flow con- trol and check for obstructions. Clear or replace.

#### TROUBLESHOOTING (cont.) PROBLEM

PROBLEM	PROBABLE CAUSE	REMEDY
Spitting or excessive steaming	1. Lime Build-up <b>CAUTION</b> - Tank and tank compo- nents should be delimed regularly depending on local water condi- tions. Excessive mineral build-up on stainless steel surfaces can initiate corrosive reactions resulting in serious leaks.	Inspect tank assembly for excessive lime deposits. Delime as required.
	2. Control Thermostat	Refer to <i>Service</i> - Control Ther- mostat for testing procedures. See page 17
Drip-out time too long	1. Funnel Tip	The brew funnel should be cleaned thoroughly before each brew cycle to lessen the chance of tea leaf par- ticles clogging the drip-out tip.
Dripping from sprayhead	1. Syphon System	The brewer must be level or slightly lower in front to syphon properly.
	2. Lime Build-up <b>CAUTION -</b> Tank and tank compo- nents should be delimed regularly depending on local water condi- tions. Excessive mineral build-up on stainless steel surfaces can initiate corrosive reactions resulting in serious leaks.	Inspect the tank assembly for excessive lime deposits. Delime as required.
	3. Brew Solenoid Valve	Refer to <i>Service</i> - Brew Solenoid Valve for testing procedures. See page 16
Water flows into tank continu- ously (ON/OFF Switch "ON") or (UNSWEET/OFF/SWEET Switch in "UNSWEET" or "SWEET" position)	1. Brew Timer	Refer to <i>Service</i> - Brew Timer for testing procedures. See page 18
Water flows into tank continu- ously (ON/OFF Switch "OFF") or (UNSWEET/OFF/SWEET Switch in "OFF" position)	1. Brew Solenoid Valve	Refer to Service - Brew Solenoid Valve for testing procedures. See page 16

TROUBLESHOOTING (cont.)		
PROBLEM	PRUBABLE CAUSE	REMEDY
Beverage overflows dispenser	1. Dispenser	The dispenser must be complete- ly empty before starting a brew cycle.
	2. Brew Timer	Refer to <i>Service</i> - Brew Timer for testing procedures. See page 18
	3. Brew Solenoid Valve	Remove the Brew Solenoid Valve and clean any obstruction. Rebuild or replace the valve if necessary. See page 16
	4. Dilution Timer	Refer to <i>Service</i> - Dilution Timer for testing procedures. See page 21
	5. Dilution Solenoid Valve	Refer to <i>Service</i> - Dilution Solenoid Valve for testing procedures. See page 20
Weak beverage	1. Filter Type	BUNN <sup>®</sup> paper filters must be used for proper extraction.
	2. Tea	A sufficient quantity of fresh, loose tea leaves should be used for proper extraction.
	3. Sprayhead	A clean stainless steel sprayhead must be used for proper extrac- tion.
	4. Funnel Loading	The BUNN <sup>®</sup> paper filter must be centered in the funnel and the bed of tea leaves leveled by gentle shaking.
	5. Water Temperature	Place an empty funnel on an empty dispenser beneath the sprayhead. Initiate a brew cycle and check the water temperature immediately below the sprayhead with a ther- mometer. The reading should not be less than 200°F (93°C). Adjust the control thermostat to increase the water temperature. Replace if necessary.

TROUBLESHOOTING (cont.) PROBLEM	PROBABLE CAUSE	REMEDY
Dry tea leaves remain in the fun- nel	1. Funnel Loading	The BUNN <sup>®</sup> paper filter must be centered in the funnel and the bed of grounds leveled by gently shaking.
Brewer is making unusual noises	1. Solenoid(s)	The nut on the solenoid(s) must be tight or it will vibrate during operation.
	2. Plumbing Lines	Plumbing lines should not be rest- ing on the counter top.
	3. Water Supply	(A) The brewer must be connected to a cold water line.
		(B) Water pressure to the brewer must not exceed 90 psi (620 kPa). Install a regulator if necessary to lower the working pressure to ap- proximately 50 psi (345 kPa).
	4. Tank Heater	Remove and clean lime off the tank heater. See page 27
Sweetener is not working	1. Sweetener box is empty	Check the Sweetener box to make sure it is not out of product.
	2. Flow Adjustment screw is closed	Check the Flow Adjustment screw to make sure the valve has not closed.
	3. Solenoid is defective	Refer to <i>Service</i> -Sweetener Sole- noid Valve for testing procedures. See page 26
	4. The Pump is defective	Check the manufacturers warranty for additional information on test- ing and replacement of a defective pump.

#### SERVICE

This section provides procedures for testing and replacing various major components used in this brewer should service become necessary. Refer to *Troubleshooting* for assistance in determining the cause of any problem.

**WARNING -** Inspection, testing, and repair of electrical equipment should be performed only by qualified service personnel. The brewer should be disconnected from the power source when servicing, except when electrical tests are required and the test procedure specifically states to plug in the brewer.

#### **COMPONENT ACCESS**

**WARNING** - Disconnect the brewer from the power source before the removal of any panel or the replacement of any component.

All components are accessible by the removal of the top cover and rear inspection panel.

The top cover is attached with one #6-32 screw. Removal of the top cover will allow access to ON/OFF switch, start switch, brew timer, dilution timer, control thermostat, limit thermostat and tank heater,

The rear inspection panel is attached with six #8-32 screws. Removal of the rear panel will allow access to the brew solenoid valve, dilution solenoid valve and the sweetener solenoid valve (optional), .195 GPM & .750 GPM flow control and check valves.

#### **Contents**

Duran O a la matel Malura	10
Brew Solenoid Valve	16
Control Thermostat	17
Digital Brew Timer	18
Dilution Timer	20
Dilution Solenoid Valve	21
Limit Thermostat	22
Start Switch	23
ON/OFF Switch	24
UNSWEET/OFF/SWEET Switch	25
Sweetner Solenoid	26
Tank Heater	27
Wiring Diagrams	

#### SERVICE (cont.) BREW SOLENOID VALVE



#### SERVICE (cont.) CONTROL THERMOSTAT



#### Location:

The control thermostat is located inside hood on the right side just behind the dilution timer.

#### Test Procedures:

- 1. Disconnect the brewer from the power source.
- 2. Locate the blue/black wire on the control thermostat.
- 3. With a voltmeter, check the voltage across the blue/black wire on the control thermostat and the white wire on the tank heater for 100 volt and 120 volt two wire models or red wire on the tank heater for 230 volt two wire models. Connect the brewer to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models.
  - b) 230 volts ac for two wire 230 volt models.
  - c) 100 volts ac for two wire 100 volt models.
- 4. Disconnect the brewer from the power source.

If voltage is present as described, proceed to #5. If voltage is not present as described, refer to the *Wir-ing Diagrams* and check the brewer wiring harness.

- 5. Locate the black wire on the control thermostat.
- 6. Gently remove the capillary bulb and grommet from the tank.
- 7. With a voltmeter, check the voltage across the black wire of the control thermostat and the white wire on the tank heater for 100 volt and 120 volt two wire models or red wire on the tank heater for 230 volt two wire models when the control

thermostat is turned fully clockwise. Connect the brewer to the power source. The indication must be:

- a) 120 volts ac for two wire 120 volt models.
- b) 230 volts ac for two wire 230 volt models.
- c) 100 volts ac for two wire 100 volt models.
- 8. Disconnect the brewer from the power source.

If voltage is present as described, reinstall the capillary tube into the tank to the line 4.5" above the bulb, the control thermostat is operating properly.

If voltage is not present as described, replace the thermostat.

Removal and Replacement:

- 1. Remove both wires from the control thermostat terminals.
- 2. Remove the thermostat capillary bulb by firmly pulling up on the capillary tube at the tank lid. This will disengage the grommet from the tank lid.
- 3. Remove the #8-32 screw holding the control thermostat to its bracket.
- 4. Slide the grommet to the line 4.5" above the bulb on the new capillary tube.
- 5. Insert the capillary bulb through the hole in the tank lid and press the grommet firmly and evenly so that the groove in the grommet fits into the tank lid.
- 6. Carefully bend the capillary tube so that the tube and bulb inside the tank are in a vertical position.

**NOTE** – The capillary tube must be clear of any electrical termination and not kinked.

- 7. Fasten the new control thermostat to its bracket.
- 8. Refer to Fig. 5 when reconnecting the wires.
- 9. Adjust the control thermostat as required.



#### SERVICE (cont.) DIGITAL BREW TIMER (cont.)

**To increase a brew volume**, place the ON/OFF switch in the "ON" position, press and hold the START switch until three clicks are heard. Release the switch and press it again one or more times. (Failure to release the switch within two seconds after the third click causes the volume setting to be aborted and previous volume setting will remain in memory.) Each time the switch is pressed, two seconds are added to the brew time period. Allow the brew cycle to finish in order to verify that the desired volume has been achieved.

**To decrease a brew volume**, place the ON/OFF switch in the "ON" position, press and release the START switch once for every two-second interval to be removed from the total brew time period; then immediately press and hold down the START switch until three clicks are heard. Release the switch. (Failure to release the switch within two seconds after the third click causes the volume setting to be aborted and previous volume setting will remain in memory). Allow the brew cycle to finish in order to verify that the desired volume has been achieved.

2. **Setting brew volumes.** To set a brew volume, first check that the SET/LOCK switch is in the "SET" position on the circuit board. Place the ON/OFF switch in the "ON" position, press and hold the START switch until three distinct clicks are heard and then release the switch. (Failure to release the switch within two seconds after the third click causes the volume setting to be aborted and previous volume setting will remain in memory.)

View the level of the liquid being dispensed. When the desired level is reached, turn the ON/OFF switch to "OFF".

**NOTE:** Several ounces of water will continue to syphon from the tank after turning the switch "OFF". The brewer remembers this volume and will continue to brew batches of this size until the volume setting procedure is repeated.

**NOTE:** When brewing tea, volume will decrease due to absorption by the tea grounds.

3. **Setting programming disable feature.** If it becomes necessary to prevent anyone from changing brew time once programmed, you can set the SET/ LOCK switch to the "LOCK" position. This will prevent any further programming until switch is once again put into the "SET" position.



SERVICE (cont.) DILUTION SOLENOID VALVE



#### SERVICE (cont.) DILUTION TIMER



#### Location:

The dilution timer is located inside the hood on the right side. It consists of the dial plate with two dials and circuit board.

#### Test Procedure:

- Disconnect the brewer from the power source and remove the wires from terminals TL3, TL4, & TL5 of the timer and rotate both dials fully counterclockwise.
- With a voltmeter, check the voltage across terminals TL1 and TL2 when the ON/OFF switch is in the "ON" position. Connect the brewer to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models.
  - b) 230 volts ac for two wire 230 volt models.
  - c) 100 volts ac for two wire 100 volt models.
- 3. Disconnect the brewer from the power source.

If voltage is present as described, proceed to #4. If voltage is not present as described, refer to the *Wir-ing Diagrams* and check the wiring harness.

4. Check for continuity across the green and red/ black wires when the start switch is held in the lower position. If continuity is present as described, reconnect the wires to terminals TL3, TL4, & TL5 of the timer board and proceed to #5.

If continuity is not present as described, refer to the *Wiring Diagrams* and check the wiring harness.

5. With a voltmeter, check the voltage across terminals TL1 and TL4 when the ON/OFF switch is in the "ON" position and the start switch is momentarily placed in the lower position. Connect the brewer to the power source. After a delay of approximately three minutes, the indication must be:

a) 120 volts ac for two wire 120 volt models for approximately one minute and then return to its previous indication.

b) 230 volts ac for two wire 230 volt models for approximately one minute and then return to its previous indication.

c) 100 volts ac for two wire 100 volt models for approximately one minute and then return to its previous indication.

6. Disconnect the brewer from the power source.

If voltage is present as described, the timer is operating properly. Adjust the timer dials as required. If voltage is not present as described, replace the timer.

#### Removal and Replacement:

- 1. Remove all wires from the timer.
- 2. Remove the circuit board and dial plate from the brackets.
- 4. Install the new dial plate and circuit board to the brackets.
- 5. Refer to Fig. 11 when reconnecting the wires.
- 6. Adjust the timer dials as required.











#### SERVICE (cont.) SWEETNER SOLENOID VALVE



#### Location:

Viewing the brewer from the front, the sweetener solenoid is mounted on the right side of the solenoid mounting bracket which is secured to the bottom base housing.

#### Test Procedure:

- 1. Disconnect the brewer from the power source.
- 2. With a voltmeter, check the voltage across the brown/white and white/violet wires on the sweetener solenoid terminals when the UNSWEET/OFF/ SWEET switch is in the "SWEET" position and the start switch is momentarily placed in the lower position. Connect the brewer to the power source. After the approximate setting on the delay dial, the indication must be:
  - a) 120 volts ac for two wire 120 volt models.
  - b) 230 volts ac for two wire 230 volt models.
  - c) 100 volts ac for two wire 100 volt models, remain for the approximate setting on the dilution dial, and then return to its previous indication.
- 3. Disconnect the brewer from the power supply.

If voltage is present as described, proceed to #4. If voltage is not present as described, refer to the Wiring Diagrams and check the wiring harness.

4. Remove both wires from the coil and check for continuity across the coil terminals. If continuity is present as described, reconnect the brown/white and white/violet wires and proceed to #5.

If continuity is not present as described, replace the solenoid valve.

- 5. Check the solenoid valve for coil action. Connect the brewer to the power source, place the UNSWEET/OFF/SWEET switch in the "SWEET" position and momentarily place the start switch in the lower position and release. At the start of a brew cycle, listen carefully in the vicinity of the solenoid valve for a "clicking" sound as the coil magnet attracts and at the end of the brew cycle when the plunger is released.
- 6. Disconnect the brewer from the power source.

If the sound is heard as described and sweetener will not pass through the solenoid valve, there may be a blockage in the sweetener line before or after the solenoid valve or, the solenoid valve may require inspection for wear, and removal of particles.

If the sound is not heard as described, replace the solenoid valve.

#### Removal and Replacement:

- 1. Remove all wires from the solenoid valves.
- 2. Turn off the sweetener supply to the brewer.
- 3. Disconnect the water lines to and from the solenoid valves.
- 4. Remove the two #8-32 keps nuts holding the solenoid bracket to the mounting bracket.
- 5. Lift out the valve and bracket.
- 6. Remove the two #10-32 slotted-head screws holding the solenoid valve to the mounting bracket.
- 7. Securely install the new solenoid valve to the mounting bracket.
- 8. Attach the solenoid valve and bracket to the mounting bracket.
- 9. Securely fasten the sweetener and water lines to and from the solenoid valves.
- 10. Refer to Fig. 19 when reconnecting the wires.



#### SCHEMATIC WIRING DIAGRAM TB3, TB3B, TB3-LP







